GEOGRAFIE

SBORNÍK
ČESKÉ GEOGRAFICKÉ SPOLEČNOSTI

1996/2
ROČNÍK 101

GEOGRAFIE
SBORNÍK ČESKÉ GEOGRAFICKÉ SPOLEČNOSTI
GEOGRAPHY
JOURNAL OF CZECH GEOGRAPHIC SOCIETY

OBSAH - CONTENTS

HLAVNÍ ČLÁNKY - ARTICLES

ROZHLEDY - REVIEWS

Dear friends!

It is a great pleasure for me to greet you while you are opening the second issue of Geography – Journal of Czech Geographic Society, volume No. 101. The 28th International Geographic Congress will be organized in The Hague in August this year. This whole issue of Geography – Journal of Czech Geographic Society has been prepared by the new editorial board in English so that it could be used for a quality presentation of Czech geographers at the Congress. We suppose that in future Geography – Journal of Czech Geographic Society will continue to publish geographical articles written by experts from all Czech geographical institutes and departments; moreover we want Geography – Journal of Czech Geographic Society to become a real showpiece of Czech geographers. As a result, some articles will be published in English in future (with extensive Czech summary). Czech written articles, however, will prevail; foreign language summaries will be provided. Therefore this issue is a sort of exception as regards both the language and contents. Apart from scientific articles also informational contributions are included.

We believe that foreign readers will welcome the English written articles and we also beleive that No 2/1996 Geography – Journal of Czech Geographic Society will contribute to the promotion of Czech geography abroad.

Ivan Bičík, President, Czech Geographic Society

Vážení čtenáři,

právě jste otevřeli druhé číslo časopisu, který v letošním roce vstoupil do 101. ročníku vydávání. Rok 1996 je zároveň rokem XXVIII. kongresu Mezinárodní geografické unie (IGU/UGI), který proběhne počátkem srpna v nizozemském Haagu. Nová redakční rada připravila toto číslo v angličtině, aby se jím mohla geografie České republiky na významném mezistátním setkání geografů z celého světa prezentovat. Předpokládám, že i nadále bude náš časopis sloužit nejen k publikování odborných výsledků geografů všech pracovišť ČR, ale měl by být i organizačním a informačním materiálem geografů především naší republiky. Proto i v budoucnu lze očekávat, že některé články budou publikovány v angličtině (s větším českým shrnutím) a většina dalších i nadále v jazyce českém (s cizojazyčnými summary). Proto lze toto číslo jazykově pokládat za spíše výjimečné. Pokud jde o náplň, tak vedle článků publikujících výsledky výzkumu, obsahuje i statě informačního charakteru.

Českým čtenářům přejeme, aby se přes obtížnější čtivost v článcích orientovali. Vážným zájemcům o problematiku určitého článku může autor zaslat jeho českou verzi – pokud ji má ovšem k dispozici.

Věřím, že zahraniční čtenáři časopisu, tuto výjimku v použitém jazyce spíše přivítají a věřím, že tímto způsobem Geografie – Sborník ČGS 2/96 přispěje k propagaci naší práce v zahraničí.

Ivan Bičík, prezident ČGS

GEOGRAFIE – SBORNÍK ČESKÉ GEOGRAFICKÉ SPOLEČNOSTI
ROK 1996 • ČÍSLO 2 • ROČNÍK 101

MARTIN HAMPL

GEOGRAPHY OF SOCIETAL TRANSFORMATION: GENERAL QUESTIONS OF STUDY

M. Hampl: *Geography of Societal Transformation: General Questions of Study.* – Geografie-Sborník ČGS, 101, 2, pp. 82 – 91 (1996). – The paper is devoted both to empirical generalization of contemporary transformation in the Czech Republic and to the theoretical discussion of selective problems of geographical cognition. Stress is put upon the question of geographical regularities, relation between social and geographical structures and the problem of uneven development.
KEY WORDS: Societal transformation – geographical regularities – uneven development.

The author would like to thank Grant Agency of Czech Republic for support of the grant no. 30258 (Theory of regional differentiation of Societal Development) under which this contribution was prepared.

1. Introduction

The transformation processes in post-totalitarian countries have become an important theme in possibly all social sciences, social geography included. Changes in the locational attractiveness of countries and regions, as well as the territorial differences in the dynamics and successfulness of transformation processes certainly deserve increased interest in geographical study. Moreover, contemporary social geography is classifying itself clearly among social sciences, so the interest in internal societal problems and their solutions becomes primary. This is also linked to the disillusionment caused by problematic results of "positivistic" geography.

There is a question, however, whether repeated conceptual imports from other sciences may help to solve epistemological problems of geography. The present plurality of paradigms amplified by post-modern admiration for disorder may express adequately reached knowledge of socio-geographical reality. In that case, though, it only one account of an extraordinary complex reality. This may be why much research continues to have either a mainly descriptive character or a general but too speculative orientation. An eloquent example is the geographical study of societal transformation (cf. e.g. Carter, F. W., Maik, W. eds., 1995). This serves as a starting point for the discussion of general questions about geographical study.

The first aim of this contribution is a theoretical discussion about geographical aspects of the study of societal transformation. The discussion is understood as a certain superstructure above an empirical depiction of the Czech reality, though already in a generalized form. These "primordial" empirical generalizations of up-to-date transformation results should lend support above all to the existence of geographical regularities. These regularities are thought of as a stochastic or "frame" type, and do not exclude secondarily

important peculiarities of the structures and evolution processes in individual regions or localities. In the second part, the discussion is concentrated on the problem of relation or of connection between the social and the geographical organizations. The duality in understanding this relation is a fundamental problem of a subject classification of social geography. This duality may be expressed as whether the subject here is a transformation of geographical organization of society, or the geographical organization of societal transformation. Finally, the third part of the paper deals with the question of the so-called uneven (particularly territorial) societal development. This problem may be considered as a key problem for the establishment of assessment criteria in case of the regional development and regional policy. It is also important for the assessment of "great problems" such as questions of social justice, justifiability of societal development regulations, relations between principles of solidarity and meritocracy, etc. In that case also, duality in understanding uneven development appears: is it a question of societal decision and "social justice" or is it an objective regularity?

2. Geographical differentiation of contemporary societal transformation in the Czech Republic

The results of many empirical analyses of transformation changes enable one to make generalized assessments (cf. also Hampl, M. et al., 1996, Hampl, M., 1996). These suggest a hierarchy of factors of geographical differentiation of transformation changes and corresponding regularities in this differentiation. The consequence of mentioned assessments has a special meaning in itself, because it expresses their importance succession. With regard to primordial nature of the order in geographical reality, i.e. to regularly asymmetric differentiation of this reality (Hampl, M., 1994, 1995), the problem consists in the establishment of importance consequence of geographical differentiations.

The most fundamental factor is the hierarchical organization of the socio-geographic system, not only at the level of settlements but also at the level of regions. In the transformation period, polarization between metropolitan areas and other areas increased, and is still increasing. In a simplified way, three hierarchical levels can be thus distinguished at a regional (supra-district) scale: Prague metropolitan area, other metropolitan areas, and relatively rural (non-metropolitan) areas. The changes in the settlement hierarchy at local levels are of secondary importance. It must be admitted that sharp differences in territorial settlement intensity and in resulting functional specialization of settlements does exist here. However, these differences are not new. In addition, they have more limited influence on the quality of life of the population because of the intensity of commuting between the towns and the country. Important differences can be found in the economic situation of municipalities, though (cf. Blažek, J., 1994). The reason for the integral influence of settlement and regional hierarchy on the course and results of transformation lies in correlation between size and qualitative differentiation of settlements, resp. of urban regions. Examples include the increases in diversification of economic base, share of non-productive activities, education level of the population, and increases in provision with social and technical infrastructure, etc.

The second key factor is locational and especially macro-locational attractiveness. Its role was fundamentally increased by the "opening up" of the

Czech economy and society to foreign countries. At the same time, its polarization was "reversed", due to the change in geo-political and geo-economic position of the Czech Republic. Its important application cannot be, though, explained only by the factor of distance from developed countries or regions. Fundamental societal changes in Central and Eastern Europe have made possible the revitalization of the historically rooted links between East and West. The correlation between cultural and distance zonation is proof of both force of evolutional inertia and integral – even though gradually developed – unity of Europe. This too, is a case of hierarchical polarization of the centre-periphery type but at a higher scale – the continental level. That is why the results of this polarization are best seen at the supra-national level (see also division of the Czechoslovakia). In the context of the Czech Republic, these consequences are important for macro-regional differentiation, especially in non-metropolitan areas.

The third important but selectively occurring factor is economic specialization of territorial units. Pronounced specialization brings increased sensitivity to transformation changes, both in a positive and negative sense. In the second case the most important examples are both basin areas – North Bohemian and Ostrava areas (the latter with negative influence of an unfavourable location). The disadvantages of agricultural areas are more limited in their manifestation (often due to the compensating role of favourable location). On the other hand, positive consequences of transformation can be found in the areas attractive for the tourism and recreation industry (e.g. Český Krumlov region) or in micro-regions where industrial specialization attracts foreign investors (e.g. Mladá Boleslav region).

By combining these conditions of the geographical differentiation of transformation processes, a simple typology of districts expressing the most important features of a newly created regional structure of the Czech Republic can be elaborated. There are 5 categories in this typology: Prague metropolitan area – basin (metropolitan) areas – other metropolitan areas – Western non-metropolitan areas – Eastern non-metropolitan areas. Table 1 shows characteristics of the categories. The assessment of the order or rank of the categories from the point of view of maturity and "transformation successfulness" finds correlation in almost all characteristics (see order referred to above) with the exception of the basin areas. These represent special problem units which possess notable economic power, but "restrained" economic development connected to serious social and economic unbalances. This is reflected in their ambiguous assessment according to selected characteristics.

Data in Table 1 lend support to the above formulated generalizations and help depict regularities in the basic order of regional differentiation. But with the gradual increase of territorial and content detailedness of assessment regularities in partial geographical structures "disappear". In this sense, the nature of order in geographical reality can be justifiably characterized as a hierarchy of differentiations oriented primarily from the whole to the parts i.e. "from the top". Basic differentiations of geographical systems show regular organization, which is "completed" by a variability of geographical phenomena with regard to other features, secondary by their importance. As an example, although hierarchic size differentiation of settlements occurs in every settlement system, it is almost impossible to find regular space configurations in settlement organization predicted by central place theory. Organization of geographical reality must be thus necessarily understood as an integral differentiation in coexistent combination of diverse phenomena, a

Table 1 – Basic characteristics of district categories

Category	Share on the total of CzR in %				Characteristics of transitional changes (per hab., CzR=100)						
	area	population 1995	jobs 1993	jobs in banking 1993	Tangible investments 1993	Tax incomes 1994	Private entrepreneurs 1994	Unemployed 1995	Index of jobs 1993/91	Average salaries	
										1993	index 1993/89
Metropolitan areas	23,4	47,0	51,3	63,3	128	134	107	84	102	108	104
in them: Prague	2,2	13,4	16,0	32,4	171	205	136	10	108	121	113
basin	5,2	12,9	12,4	9,8	118	103	77	188	93	110	100
other	16,0	20,7	22,9	21,1	108	107	106	68	104	98	99
Non-metropolitan areas	76,6	53,0	48,7	36,7	75	70	94	114	98	93	97
in them: Western	38,6	22,7	20,8	17,1	86	78	99	103	96	96	99
Eastern	38,0	30,3	27,9	19,6	67	64	91	122	99	90	95

Notes: Distribution of districts into the categories: Prague metropolitan area contains Praha, Praha-východ a Praha-západ; basin areas contain districts Chomutov, Most, Teplice, Ústí nad Labem, Ostrava, Karviná, Frýdek-Místek; other metropolitan areas contain districts České Budějovice, Plzeň-město, Plzeň-jih, Plzeň-sever, Karlovy Vary, Liberec, Jablonec nad Nisou, Hradec Králové, Pardubice, Brno-město, Brno-venkov, Zlín and Olomouc. Other districts of Mid-Bohemian, South-Bohemian, West-Bohemian and North-Bohemian regions form Western non-metropolitan areas and other districts of East-Bohemian, South-Moravian and North-Moravian regions form Eastern non-metropolitan areas. In the case of tangible investments their financial amount is assessed, in the case of tax incomes these are incomes of the municipalities and the districts from the salaries of employees and small entrepreneurs. Data about jobs 1991 originate from the Census 1991 and encompass all the jobs, similar data for 1989 and 1993 (including data about salaries) encompass only civilian sector, in 1993 without small enterprises (with 24 and less employees).

Sources: Census 1991; internal publications of the Czech Statistical Office: Employment and salaries 1989, Districts of the Czech Republic 1994, Selected indicators of the districts of the Czech republic in the 1st half-year 1995; Internal materials of the Ministry of Finance of the Czech Republic.

differentiation which is extremely asymmetric to the high occurrence of unfavourable combinations and the low occurrence of highly favourable combinations. The distance factor itself is applied only in a partial and modified way. The spatial organization of phenomena must be thus necessarily understood before all as an external expression of hidden nature, so its exact form is neither regular nor important (see also the application of realism: structures – mechanisms – events, Sayer, A., 1984).

In this context, a critique of positivist geography can be added. Its failure was not primarily a consequence of narrowing study to "the empirically found

out and verified", but a consequence of inadequate reduction of the subject of geographical study (and thus also of appropriate empirical findings) to spatial structures. Although in the post-positivist period "the geographical" is again completed in content especially in connection with enforcement of contextual explanation (Hägerstrand, T., 1973, 1995, Thrift, N., 1983), stress is too much put on internal social relations, on mere spatial "constraint" of social integration in the frame of localities and regions.

3. Duality in the conception of the relation between geographical and social reality

In geographical studies dealing with societal problems two fundamental approaches and related thematic directions can be identified. First is an examination of geographical organization of society as a relatively autonomous structure conditioned both by an interaction of the society with its natural environment and by an "external" interaction of territorial societal subjects themselves (settlements, regions). In these interactions, the influence of a distance factor can be felt. Second is an examination of the situation and changes of economic, social and political conditions in various territorial units, i.e. an examination of the differentiating influence of geographical combinations of partial societal structures and processes. In this case the concept of the society is narrowed to its "internal" organization as is usual in social science research. The consequence of this is a usual assessment of geographical differentiation of the society only as a result of secondarily important or modifying application of specific conditions of external environment to the realisation of general tendencies formed by the principle of internal organization of society and its evolutional movement. As an example of these approaches is the interaction between the global and the local (see e.g. critical discussion in Sayer, A., 1991) or much contemporary geographical work about transformation processes in post-totalitarian countries.

Both approaches are of course justified and do not exclude each other. The thing is that the mentioned duality corresponds both to a relative autonomy of above characterized internal (societal in narrower sense) and external (geographical resp. ecologic) organization of the society and to their integral unity and correspondent mutual influencing. It is only the mutual combination of both approaches that can bring deeper and more complete knowledge of these problems. The geographical differentiation has an irreplaceable role in the development of the society as a source of significant evolution impetuses. Differences in external conditions of more narrowly defined societal system are at the same time not only random combinations of environmental factors but in the first place regular differentiation of the environment i.e. hierarchic (asymmetric) organization of mentioned combinations from the point of view of their favourableness. That is why fundamental features of geographical differentiation in transformation dynamics and successfulness of localities are regular. An example is the settlement and regional hierarchy or macro-locational zonation characterized above. Analogously, there can be expected regularities in geographical diffusions of changes. On the other hand, the "internal" movement of the society influences changes in its external organization both as regards transformation of functional specialization of localities and regions and changes in central functions and in regional importance of cities.

It seems, however, that the contemporary orientation of human geography deviates from the discussed unification of both approaches of geographical examination of development of the society. An adoption of paradigms from social sciences leads understandably also to an adoption of problem themes and examination tasks, especially sociological and political ones. The situation is characterized by formation of two or three main types of approaches. These include: voluntarist approaches proceeding from the decisive role of activity of a human individual (e.g. behaviour geography); structuralist – functionalist or neo-marxist, stressing the role of societal organization (especially marxist geography); approaches trying to overcome traditional sociologic duality by means of a study of interaction between an individual and social organization – especially the theory of structuration (Giddens, A., 1984 and others) and realism (Bhaskar, R., 1979, Sayer, A., 1984). In all these cases the attention of geographical study is shifted "inside" the society (though proclaiming at the same time the importance of spatial factors when forming combinations of social phenomena and processes) and it leads to an exchange of geographical examination tasks for sociological, political or possibly economic tasks. Jointly, an ideologization of study is increased, sometimes even deliberately (e.g. Harvey, D., 1974).

The study of the geographical organization of changes and unbalances in "internal" societal situation is crucial for two reasons. First, societal demand for such studies results from the needs of the decision sphere, both at central and local levels. Second, the dynamics of transformation changes, which increases the attractiveness of their study. It can be seen, generally, that the changeability of social and especially economic conditions is greater in the period of transformation than the changeability of geographical conditions. For example, Czech population distribution remained very stable after 1989 (in all categories of districts examined in Table 1 the index of shares on the total population of the Czech Republic in 1991 – 1995 was 100), and from the point of view of job distribution the changes were only limited. In such a short period of time, the size hierarchy of cities or areas of regional influence of centres could not change to any notable extent. On the other hand, regional differences in the increase of salaries, even in spite of prominent social policy of government, were great and the differences in the dynamics of privatization processes or economic growth were even greater by orders. All this corresponds to the complex and cumulative character of the conditioning of geographical organization and its changes, due to the important connections to diverse physical structures (housing stock, technical infrastructure) and natural environment.

In spite of the more limited changeability of geographical organization of the society, its role in the "internal" development of society is considerable. This occurs because first, there is an extraordinary extent of differentiation of this organization and thus of different favourableness of "external" conditions of social and economic transformation. It is because of the fundamental societal changes after 1989 that this importance of differentiating and stimulating influence of geographical conditions on societal development arose fundamentally. The potential of existing differences in the quality of geographical conditions was realized gradually in consequence to democratization and transition to the market economy. Thus, in the centre of the research effort of geography should be an assessment of possibilities of effective realization of this potential, finding the ways how to remove barriers to both spontaneous selective processes (see e.g. underdevelopment of housing market) and the

ways how to suitably support cooperative processes (deepening territorial distribution of labour), diffusion of innovations, etc. Only after seeing the solution to these problems can it be justified to discuss special questions how to realize social and economic transformation, questions dealing with regional policy, the influence of macroeconomic policy on regional development, etc.

Although in the first phase of transformation especially differentiating influence of geographical organization on the course of internal societal changes is dominant, it is without any doubt that new tendencies appear in the development of geographical organization of society itself. Their full expansion can be expected only in the following and longer period. This is because removal of the barriers (e.g. to migration) cannot be realized in the short term. The same is true with deepening the differences in the allocation of resources and labour force demands which will gain importance only after changes in company behaviour which are contingent upon privatization. In spite of all this, certain signs of development of suburban processes, the formation of potential emigration regions, or partial changes in working activity especially in metropolitan areas, can be seen already. Thus, both in the up-to-date and in the future development rather limited development of extensive processes and contrarily strengthened development of intensification processes must be expected. Shifts in the distribution of population or jobs will not be much extended, but changes in functional importance of centres and whole regions, in territorial organization of relations and in changes of central places role of the cities may be relatively significant. Their influence and regional importance may first increase at the centres of service and quaternary activities.

At the same time, simultaneous with the opening up of the economy and the linking between elements of the settlement system, integration tendencies will be strengthened. In the basic skeleton of the settlement system two or three interlinked trends have appeared already. First, there is a partial substitution of a traditionally quantitative (size) hierarchy of centres by qualitative (functional importance) hierarchy. Second, the hierarchic polarization (centre – periphery) move gradually to higher rank/scale levels. In the conditions of the Czech Republic, this is the case of higher regional levels in the context of the national system (Prague metropolitan region – other metropolitan regions – non-metropolitan areas) and the case of supranational level (integration into European system of centres and axes).

4. Conclusion: is uneven development a problem or a regularity?

A discussion about the problem of uneven development of the society is in the centre of interest of many geographer's works with theoretical or application orientation. This discussion is usual starting point for assessments of development of the society, creation of different regulative conceptions of "improvement" of spontaneous processes, etc. Uneven development is in them generally considered before all as a social problem, as an undesirable creating or deepening of social unbalances. The authors with marxist orientation even explain uneven development by means of political and economic nature of capitalism and in this sense they connect it only with the capitalist system (Smith, N., 1990). This opens possibilities for confusing conditionality of the development of internal and external organization of the society, confusing the real and the normative evaluations.

Starting point for the discussion should be putting the problem of uneven development into general context. First, it is necessary to refer to general predominance of selective tendencies in development not only of the geographical organization of the society but in the development of the environmental or integral systems in general. Evolution of qualitative differentiation of reality has of an extremely selective character: from quantity of the lower the "few" higher arise; spatial occurrence of a locale with allotment of evolutionary higher phenomena is extremely limited and is furthermore internally differentiated in an extraordinary manner (for example the limited extent of the ecumena, the scarce occurrence of great concentrations of progressive economic activities in its context, etc.). All this allows one to accept the conclusion about universal validity and regular nature of "uneven development" of real systems of integral (complex) type. Development of the society in an environment introduces more complexity, and for that reason specific forms of selective processes. The "internal" and "external" organization of society must be understood as having certain coordinating and mediating structures in an interaction between relatively homogeneous mankind and its external, extremely heterogeneous environment. In the formation of external organization of the society, selective processes are necessary, not only because of an adaptation to external differences in the suitability of environment, but also because of societal activity leading to the creation of new forms of territorial division of labour (see especially advantages of the territorial concentration and corresponding nodal organization of socio-geographical regions). Owing to selective or concentration processes the grade of unevenness in geographical distribution of societal phenomena is more intensive than that of natural phenomena. At the same time, extreme unevenness is mostly found only from the point of view of territorial intensity of phenomena occurrence (e.g. density of population). From the point of view of quality of life represented in a simplified way by the "income per capita" this unevenness is considerably lower. Connections between both types of unevenness are immediate: more effective geographical distribution of population can be realized only by means of a corresponding increase in the standard of living.

As a matter of fact, the regular nature of "uneven development" makes absurd its assessment from the social justice point of view. This can deal only with the results of development. With respect to their complex character, the assessments of different partial results will be of course different. On the one hand, the profitability of efficient elements will be raised, but in addition, the economic force of the whole system will be raised, too. That is why in transformation or dynamic periods, an accentuation of selective processes can be found. The acceleration of development by means of an increased selectiveness usually brings about a lot of more profound though not immediately evident advantages, even for the inefficient elements. These include the deepening of territorial division of labour, finding more suitable specialization for most elements of the system, and the ensuing development of cooperative processes in the whole system.

On the other hand, one may also encounter a deepening of social differences and polarization of the rich and the poor. Excessive unevenness of such types increases possibilities of social destabilization, the rising of populist political representations, or even social revolution. From the strategic angle of view it is desirable to maintain social stability. Another danger of disorders in societal evolution comes from the possibility of monopolizing economic power, which would restrict the market as a key mechanism of selection. It

stands to reason that favourable societal development depends to a considerable extent on ensuring proportionality in enforcing both selective and homogenizing processes, on creating a suitable extent of respecting meritocracy principles and solidarity principles. Necessary autoregulative mechanisms for finding the mentioned proportionality are already built in spontaneous societal development: for example the distribution of activities and deepening of specialization of the parts, the migration of the population which mostly enforces differences in settlement intensity but at the same time reduces differences in income of people due to their transfer into better paid sectors, richer regions, etc. Prevalence of cumulative tendencies in development (cf. e.g. Myrdal, G., 1957, Richardson, H. W., 1978) makes it necessary to direct aid to the poor. The degree of regulation and extent of redistribution must be decided politically.

The question of the degree of regulation cannot be solved at only one level. There will always be the question of a set of different regulative measures, so the key issue lies in their selection and chosen forms of application. It is very desirable to take into account the above discussed systemic nature of society and its development, and the role of dynamizing and stabilizing processes. The experiences of West European countries evoke a transition from simple donation policy to mobilizing policy. This calls for a necessary decentralization of power and existence of complex subjects of territorial development. However, on the contrary, there has been several years of postponing self-governing provinces in the Czech Republic. Indeed, it is not always just the question of regulation for underdeveloped units. One example is the state of housing in the Czech Republic, where support for housing construction would help not only to solve the situation of certain population groups (especially young families), but also to remove barriers of selective spatial mobility of the labour force (the deregulation of rent is necessary at the same time). Generally, the advantage of aid in the spheres which are connected with the development of (territorial) division of labour should be stressed. These spheres help to increase the interlinkage of the whole system (technical infrastructure, etc.), which supports the spread of innovations and economic cooperation.

References:

BHASKAR, R. (1979): The Possibility of Naturalism: A Philosophical Critique of the Contemporary Human Sciences, Harvester, Brighton, 228 p.

BLAŽEK, J. (1994): Local financing and settlement structure. In: M. Barlow, P. Dostál, M. Hampl (eds.), Territory, Society and Administration. The Czech Republic and the Industrial Region of Liberec. University of Amsterdam, Amsterdam, pp. 85-94.

CARTER, F. W., MAIK, W. eds. (1995): Proces przekształceń społeczno-gospodarczych w Europie środkowej i wschodniej po roku 1989. Turpress, Toruń, 164 p.

DOSTÁL, P., HAMPL, M. (1995): Geographical organization and societal development: searching for an integral approach. Acta Universitatis Carolinae – Geographica, vol. 30 (in print).

GIDDENS, A. (1984): The Constitution of Society. Polity Press, Cambridge, 402 p.

HÄGERSTRAND, T. (1973): The domain of human geography. In: R. J. Chorley ed., Direction in Human Geography, Methuen, London, pp. 67-87.

HÄGERSTRAND, T. (1995): Landscape as Overlapping Neighbourhoods. In: G. B. Benko, U. Strohmayer (eds.), Geography, History and Social Sciences. Kluwer Academic Publishers, Dordrecht – Boston – London, pp. 83-96.

HAMPL, M. (1994): Territory, Society and Geographical Organization: The Problem of Integral Knowledge. GeoJournal, vol. 32, No. 3, pp. 191-198.

HAMPL, M. (1995): Geographical Systems and the Order of Reality. In: G. B. Benko, U. Strohmayer (eds.), Geography, History and Social Science. Kluwer Academic Publishers, Dordrecht – Boston – London, pp. 71-80.
HAMPL, M. (1996): Regional development: theoretical conception and specific problems in the Czech Republic. In: Transformation Processes of Social and Economic Regional Systems in the Slovak and the Czech Republic. Acta Geographica Universitatis Comeniae, Bratislava (in print).
HAMPL, M. et al., (1996): Geografická organizace společnosti a transformační procesy v České republice. Univerzita Karlova, Praha (in print).
HARVEY, D. (1974): Population, resources and the ideology of science. Economic Geography, vol. 50, pp. 256-277.
MYRDAL, G. (1957): Economic Theory and Under-Developed Regions. Duckworth, London, 168 p.
RICHARDSON, H. W. (1978): Regional and Urban Economics. Penguin, London and New York, 424 p.
SAYER, A. (1984): Method in Social Science. A Realist Approach. Huntchinson, London, 313 p.
SAYER, A. (1991): Behind the locality debate: deconstructing geography's dualism. Environment and Planning A, vol. 23, pp. 283-308.
SMITH, N. (1990): Uneven Development, Nature, Capital and the Production of Space. Second ed., Blackwell, Oxford, 219 p.
THRIFT, N. (1983): On the determination of social action in space and time. Environment and Planning D, No. 1, pp. 23-57.

Shrnutí

GEOGRAFIE SPOLEČENSKÉ TRANSFORMACE: OBECNÉ OTÁZKY STUDIA

Hlavním cílem příspěvku je diskuse několika závažných teoretických problémů geografického studia společnosti a jejího vývoje. Diskuse je uskutečněna ve spojitosti s empirickým postižením reálného vývoje sociální a ekonomické regionální diferenciace v České republice po roce 1989. Tento vývoj je ovšem charakterizován již v generalizované úrovni, aby mohl plnit úlohu určité ilustrace nebo dokonce verifikace teoretických závěrů. Na prvém místě je řešena otázka povahy geografických pravidelností. Zdůrazněn je především jejich specifický obsah – pravidelnosti v diferenciaci jevů, jejich kombinací a jejich rozmístění – a jejich rámcová povaha: pravidelnosti nacházíme v prvé řadě v celkovém (hierarchickém) uspořádání geografických systémů podle významově primárních znaků jeho prvků (např. velikost sídel, výskyt progresívních aktivit). Naopak v dílčích subsystémech a u speciálních – sekundárně významných – charakteristik geografických jevů existuje značná a více méně nepravidelně uspořádaná variabilita. Na druhém místě je diskutována otázka vztahu společenské a geografické reality. Klíčový význam je přikládán specifikaci vnitřní (sociální, ekonomické apod.) organizaci společnosti na jedné straně a její organizaci vnější (geografické, event. geoekologické) na straně druhé. Z této specifikace vyplývají i funkce obou organizací v integrálním vývoji společnosti. V případě vnější – geografické – organizace je to především funkce diferencující, vyvolávající vývojové podněty, selektivní procesy apod. Ty současně podmiňují prohlubování celkové dělby práce, specializace částí apod. Z tohoto pohledu je posuzován i třetí diskutovaný problém tzv. nerovnoměrného vývoje společnosti. Na místo častého pojímání tohoto vývoje jako důsledku buď nesprávné ekonomické, sociální a regionální politiky nebo dokonce nespravedlivého společenského systému je dokládána zákonitá podstata nerovnoměrného vývoje. Všeobecnou snahou celého sledování je předmětově specifikovat sociální geografii a její poznávací úlohy a zpochybnit dnes módní nahrazování geografických problémů problémy více méně sociologickými, politickými, event. i ekonomickými.

(Author is with Dpt. of Social Geography and Regional Development, Faculty of Science, Charles University, Albertov 6, 128 43 Praha 2.)

Arrived to the editor's office on February 16, 1996
Recommended for publication by Jiří Blažek and Václav Gardavský

GEOGRAFIE – SBORNÍK ČESKÉ GEOGRAFICKÉ SPOLEČNOSTI
ROK 1996 • ČÍSLO 2 • ROČNÍK 101

IVAN BIČÍK,
ANTONÍN GÖTZ, VÍT JANČÁK, LEOŠ JELEČEK,
LUCIE MEJSNAROVÁ, VÍT ŠTĚPÁNEK

LAND USE/LAND COVER CHANGES IN THE CZECH REPUBLIC 1845 – 1995

I. Bičík, A. Götz, V. Jančák, L. Jeleček, L. Mejsnarová, V. Štěpánek: *Land Use/Land Cover Changes in the Czech Republic 1845 – 1995.* – Geografie-Sborník ČGS, 101, 2, pp. 92 – 109 (1996). – The article presents basic information on the long-time research programme dealing with long-termed land-use changes. This research programme is based on the land-use data of 1845, 1948, 1990, and 1995. It deals with issues marked by the International Geographic Union in 1995 as important part of the interdisciplinary research. Apart from the methodological process the article also outlines the evaluation of land-use structural changes at the district level by the index of change. This is an overall index reflecting all changes in the respective region. The case-study of Semily District verifies the methodology used at the cadastral level and shows possible applications in detailed studies of the nature/society relations.
KEY WORDS: land use/land cover changes – Czech Republic.

This article has been compiled as part of the research project No. 205/95/0611 backed by the Czech Grant Agency.

1. Introduction

1.1 Opening Remarks

In 1995 the International Geographic Union (IGU) emphasized the support of interdisciplinary projects. In this very sense the project of Land Use/Land Cover Change (LUCC) has been launched in May 1995. It is focused on changes of land-use and land-cover over the time. As such, it brings the concept of time into land-use studies that belong among traditional socio-geographical issues mostly focused on spatial relations only. The link between spacial and time concepts much enriches the traditional land-use research. The Land Use/Land Cover Methodology is applied as a modern synthetic approach to landscape studies where the history of nature/society relations in a certain area should be documented. Thus, the land-use analysis becomes an important and conclusive method documenting the intensity and structure of human influence on the landscape. The land-use analysis can either be based on existing land-use categories that can be well recognized in the open air (arable land, meadows, etc.) or on functional categories (recreational, transport, water supply functions, etc.).

How can one examine the land-use development and the nature-society relations? The analysis of detailed scale maps is the basic method which gives simplified information on the state of the landscape in different years depending on the availability of maps.

The second method is based on remote sensing and on the use of satellite images from different years. This method is quite efficient since it includes

computers and automatic drawing machines. It is limited, however, to the period of last fifty years. In future it will undoubtly be widely used as part of analyses, projects, and prognoses.

Archive records reflecting changes in small regions are the base of the third method. Irregular written records, notes, and other pieces of evidence inscribed by owners and administrators can be analysed. However, such an analysis is a time-consuming process requiring highly qualified labor force and the structural trends obtained can neither be generalized nor applied to other regions.

The fourth method deals with the land-use data recorded in different periods by official survey organizations. Land use surveys have a long tradition on the Czech territory as well as in the whole western part of the former Austro-Hungarian Empire. Land-use data by cadastral units since 1845 are available.

In legal terms, cadastral unit is "a technical unit with clear boundaries consisting of immovable property described in a common record. Each cadastral unit is marked by a numeric statistical code." (Kuba, B., Olivová, O., 1993). The average size of cadastral units in Czechia is 600 hectares. They are usually associated with one settlement and have precisely defined boundaries.

Currently there are ca. 13,000 cadastral units in the Czech Republic. Each record includes data on at least ten land-use categories available from different years. Such an amount of data requires computer facilities; establishing of a specialized geographical information system (GIS) seems inevitable. This method allows to cover the whole area by useful data and to carry out land-use analyses in any region where basic data is available. Some other socio-economic and natural data are available at the cadastral level, too: altitude, land fertility, population, number of houses and apartments, etc. As a result, one can analyse relations between the state and development of land-use on the one hand and selected characteristics on the other hand.

One might find even more approaches towards the evaluation of the long-termed land-use and land cover changes. It seems that field work – that primarily brings current data – could also characterize the development of at least some landscape elements. Field work – though time consuming and costly – is important and often necessary. It is usually a part of case studies in small regions where also other methods are applied.

We strongly believe that each of the above mentioned methods of long-termed land-use and land cover changes brings valuable results. A real picture of landscape development can be drawn and future trends can be compiled, however, only if various methods are combined.

1.2 Data Sources and Their Origins

Detailed land-use data was on the Czech territory first collected more than 180 years ago as part of cadastral records (initally called stable cadaster). It was necessary to create a base on which land tax – main source of the state budget – would be calculated. As a side result, precise triangulation network came into existence and cadastral maps (scale 1:2,880) were created. Maps were later transformed to the scale 1:2,000. The actual plot areas were calculated from these cadastral maps and all maps of medium scales were derived from them, too (Mašek, F., 1948).

Preparatory works started after the Emperor's edict dealing with "stable cadaster and land tax" had been issued on December 23, 1817. Taxation was based on plots and net income from each plot was defined. Each plot received

a plot number. Each cadastral unit (cadastral settlement) had its own map where all plots and boundaries were shown.

The main portion of work started in 1824 in Bohemia. Detailed mapping was carried out in 1826 – 1830 and 1837 – 1843. 12,696 cadastral units with 15,359,513 plots were delimited in Bohemia, Moravia, and the Czech part of Silesia. It covered 49,967 map sheets. After the maps were finished, plot areas were calculated and plots were evaluated on the grounds of land-use and land cover. Each plot was given a soil value (Mašek, F., 1948). The structure of land by cadastral units was also recorded; altogether 54 (!) land-use categories were recognized. Land-use records date back to 1845 and have survived in archives.

There have been many changes in the cadastral records over the decades. Later revisions dating from 1869 and 1882 brought new cadastral units into existence and resulted into new land summaries. Next revision was done in 1896; the revisions of 1902 and 1930 were already based on judicial districts. At the moment cadastral records from 1930s onwards are kept in some district Cadastral Offices. Simplified land-use data for ca. 13,000 cadastral units were summarized in 1948 by the Central Survey and Cadaster Archive in Prague. The work was based on district summaries and on the cadastral records. Data of 1990 and 1995 come from the computer database of the Czech Land Survey. Altogether there is a unique and extensive set of land-use data hardly to be found wherever in the world. It contains the size of all land-use categories in all cadastral units. For the sake of historical comparisons so called Basic Territorial Units (BTU) were created; these contain data of 1845, 1948, and 1990. The 1845 and 1948 BTU data were taken from the Central Survey and Cadaster Archive and modified; the 1990 and 1995 data come from the Database Centre of Czech Land Survey in Prague.

2. Methodological Overview

Land-use and land cover changes are highly topical issues in social geography.

Land-use data by the smallest areal units (cadastral units) from different years are the basic source. Different land-use categories, however, were surveyed in different years. As a result, the comparative research is based on eight basic land-use categories. Arable land, permanent cultures (gardens, orchards, hop-gardens, vineyards), meadows, and pastures form the agricultural land fund. Forests come next; water bodies, built-up areas, and "remaining" areas make up so called "other" areas. This basic structure is for specific investigations simplified to three supra-categories: agricultural, forest, and "other" land. Land-use structure by eight basic categories is available for key years (1845, 1948, 1990, and 1995) that separate periods with different nature-society relations and different land-use development.

Detailes on the methodological background have been published by Bičík, I. (1995) and Bičík, I. et al (1995) and also by other authors. Only basic priciples will therefore be mentioned now and the methodological process itself will be explained in further text.

3. Land-Use Changes in the Czech Republic and Thier Assessment

3.1 Bohemia and Moravia

Land-use changes over the past 150 years undoubtly reflect the overall changes of economic and social conditions. The development of Czech society

and its historico-geographical periodization in between 1845 and 1990 has been examined by Jeleček, L. (1995). Apart from other aspects he has also researched the consequences on land-use patterns. Historical periods are characterized as follows:

1845 – 1882 Intensive changes in the framework of agricultural land.
1882 – 1897 Minor changes of land-use structure.
1897 – 1921 More intensive changes in the framework of agricultural land.
1921 – 1948 Minor overall changes only.
1948 – 1970 Great decrease of arable and agricultural land. Built-up areas and "remaining" areas increased.
1970 – 1990 Arrangements to reduce the agricultural land losses. Minor changes within the framework of agricultural land.

The above mentioned trends have general validity at the national level only and do not reflect regional inequalities. In order to quantify these trends the index of change has been used. (See Figure 1).

3.2 Land-Use Changes by Districts 1860 – 1896 – 1930

The methodology tracing land-use changes requires to compare territorial units (districts) of similar size. There have been, however, several changes of territoral administration over the period of 1845 – 1995. Comparisons are always made by units that were in effect in the period of interest. As soon as the analysis carried out by cadastral units (basic territorial units) is finished, comparisons of any kind of administrative units that existed between 1845 – 1990 will be possible. It will also allow comparisons of areas delimited on different bases: urban agglomerations, National Parks, etc.

Judicial districts came into existence in 1850 and remained basic administrative units until 1949. Compared with the current districts (76) there were almost three times more (218) of them. Judicial districts, abolished by administrative reforms after 1948, were very homogeneous areas. The delimitation

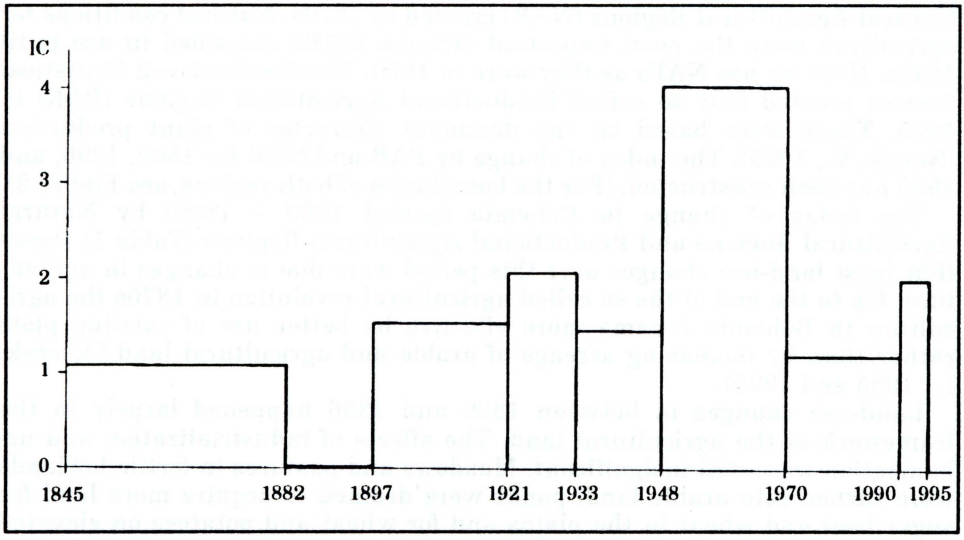

Fig. 1 – The average annual index of land-use change (1845 – 1990, Czech Republic). Axis x – years; axis y – the average annual index of land-use change.

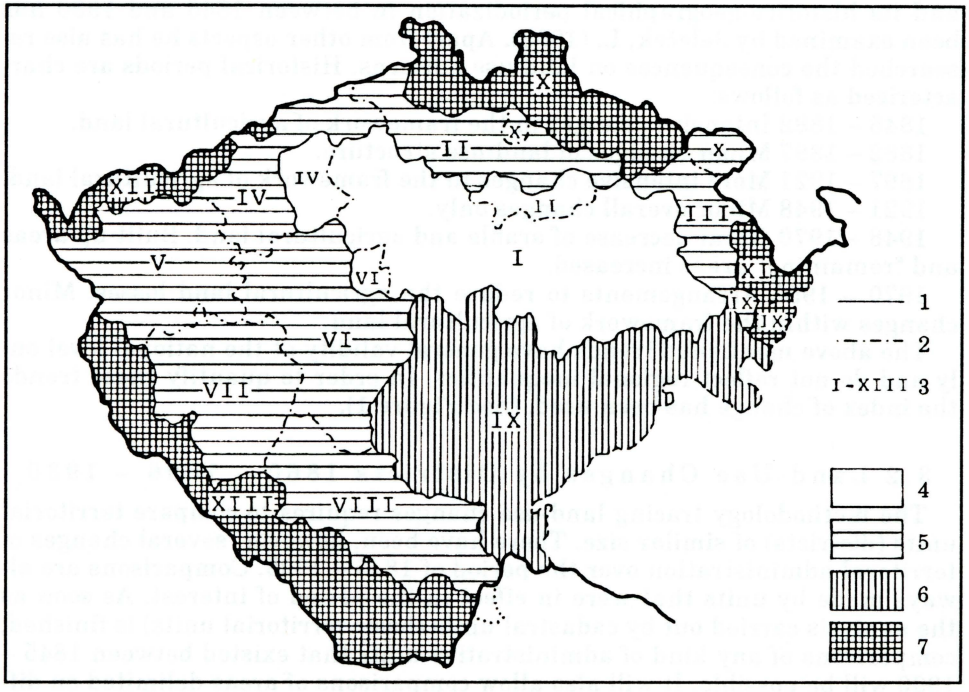

Fig. 2 – Natural Agricultural Regions (NAR; 1900) and Productional Agricultural Regions (PAR; 1930). 1 – PAR boundaries; 2 – NAR boundaries; 3 – NAR; 4 – Sugar Beet PAR; 5 – Grain PAR; 6 – Grain and Potato PAR; 7 – Fodder PAR. Source: Novák, V. et al., 1925.

of Natural Agricultural Regions (NAR) and Productional Agricultural Regions (PAR) has been based on judicial districts, too.

Agricultural records under the Austro-Hungarian Empire were based on Natural Agricultural Regions (NAR) created in 1870s. Natural conditions for agriculture were the most important criteria. NARs remained in use until 1940s. Here we use NAPs as they were in 1900. The Czechoslovak Statistical Service created four so called Productional Agricultural Regions (PAR) in 1925. These were based on the dominant character of plant production (Novák, V., 1925). The index of change by PAR and NAR for 1860, 1896, and 1930 has been constructed. (For the boundaries of both regions, see Figure 2).

The index of change in Bohemia (period 1860 – 1896) by Natural Agricultural Regions and Productional Agricultural Regions (Table 1) shows that most land-use changes over this period were due to changes in agriculture. Up to the end of the so called agricultural revolution in 1870s the agriculture in Bohemia became more effective by better use of existing plots rather than by increasing acreage of arable and agricultural land (Jeleček, L., 1985 and 1995).

Land-use changes in between 1860 and 1896 happened largely in the framework of the agricultural land. The effects of industrialization and urbanization were still insignificant. Meadows and pastures in fertile lowlands were turned into arable land; ponds were drained to acquire more land for sugar beet and wheat in the plains and for wheat and potatoes on elevated plateaus. More potatoes started to be grown in Bohemian-Moravian Highlands. In less fertile mountainous regions pastures became mostly

Table 1 – Index of Change in Bohemia 1860 – 1896 – 1930

Territory \ Period	1860-1896	1896-1930	1860-1930
Bohemia	2,85	3,80	4,77
Productional Agricultural Regions :			
Sugar beet	5,02	4,54	5,63
Grain	2,42	4,14	4,05
Grain and potato	3,12	3,10	3,99
Fodder	2,73	4,94	5,34
Natural Agricultural Regions:			
I. Bohemian Lowlands	5,48	4,41	6,37
II. Western Part of Southern Krkonoše Foothills	2,89	5,23	3,99
III. Eastern part of Southern Krkonoše Foothills	4,57	5,77	7,55
IV. Lower Ohře and České Středohoří Mts.	2,22	5,71	5,18
V. Upper Ohře	1,30	5,07	5,95
VI. Berounka and Brdy Range	2,90	3,44	3,31
VII. Plzeň Basin	2,47	5,08	5,87
VIII. South Bohemian Basins	3,87	3,75	4,73
IX. Bohemian-Moravian Highlands	3,12	3,22	3,93
X. Krkonoše Mountains	2,69	7,15	7,09
XI. Orlické Hory Mountains	1,94	11,17	11,17
XII. Krušné Hory Mountains	1,73	15,82	16,75
XIII. Šumava Mountains	3,59	2,91	5,21

aforested but some were also converted into arable land by part-time farmers. Afforestation was frequent in South Bohemia, especially in the Šumava Mts. Local landowners who managed large plots (Schwarzenberg family, etc.) transformed their businesses to more effective forest industry.

The more intesive use of agricultural land became apparent in the period 1896 – 1930. The index of change decreased in fertile regions – this was the case of Sugar Beet PAR or Bohemian Lowlands NAR. Large non-agricultural investments had not yet been allocated there. On the other hand, increase of barren land and conversion of less fertile arable land into meadows and forests already started in the highly industrialized and densely populated Sudetenland. The index of change in the Fodder Producing PAR almost doubled and it increased up to seven times in the NAR Krušné, Orlické, and Krkonoše Mts. The Šumava Mts., dominated by forestry and scattered farms, had almost no industry and show even decrease of the index. The largely rural NAR VIII where industry stagnated also shows decrease. Only a modest increase of the index of change was recorded in the NAR Bohemian-Moravian Highlands which had similar economic structure. The index of change increased in all other regions; apart from those quoted above the most significant increase was recorded in the industrial areas of Plzeň and environs (NAR VII) and around Sokolov and Cheb (NAR VII). Due to the limited

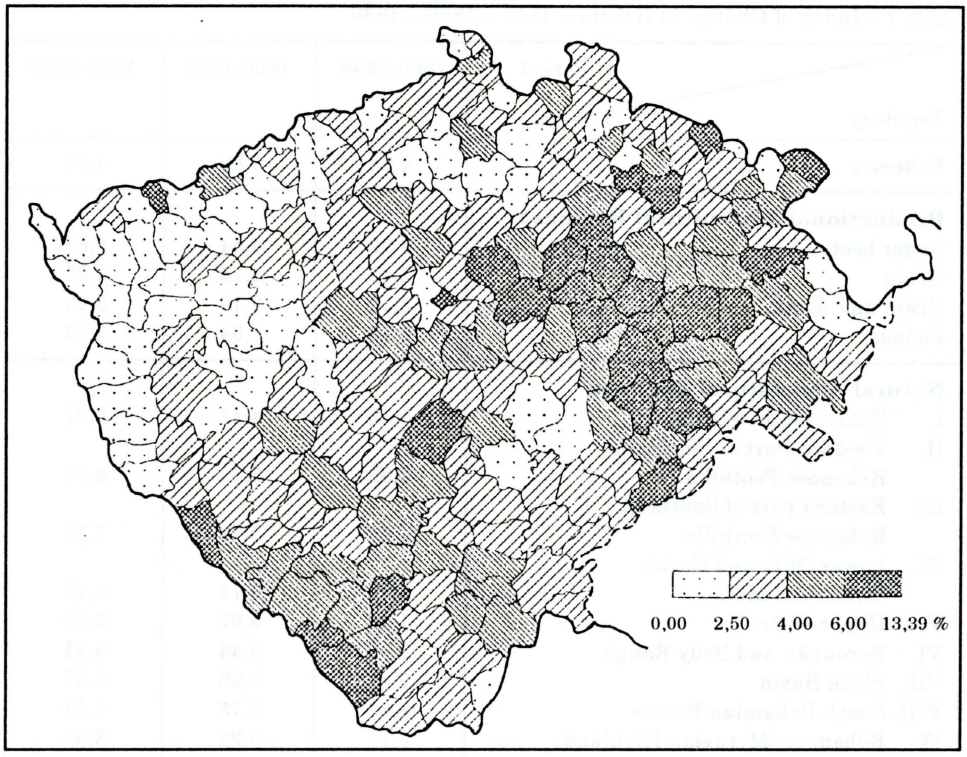

Fig. 3 – The index of land-use change by judicial districts (1860 – 1896, Bohemia; f=218)

availibility of data the index of change by districts (period 1896 – 1930) has been calculated on the base of six land-use categories only. Built-up areas, water bodies, and "remaining" areas were grouped into "other" areas.

Figure 3 shows the regional differences of the index of change between 1860 and 1896 in a more detailed manner. The indexes in judicial districts in the fertile Elbe Lowland (especially in the eastern part with the best soils) and in the Šumava Mts. exceed 6.0. On the contrary the densely populated border districts and mining, textile, and glass regions in North-West Bohemia have quite low indexes.

3.3 Land-Use Changes by Districts 1961 – 1970 – 1980 – 1990 – 1995

In contrast to the previous analyses this chapter deals with land-use changes by the current districts. 76 districts existed in the end of 1995.

Analyses are based on the complete land-use structure (i.e. eight categories) used also at the cadastral analyses. Though there have been some changes in district boundaries, these have not exceeded 1 % of district area in most cases. For technical reasons it has not been possible so far to make recalculations in areas where more significant changes occurred. It is the case of districts Prague (treated as one unit), Prague-East, Prague-West, Beroun, and Příbram. Nevertheless, data shown in cartograms may be considered as accurrate ones.

Land-use changes are described by the overall index of change that indicates the share of land where any land-use chage occurred over the given period of time. Though changes of all eight land-use categories in all periods could be shown, due to the limited capacity of this issue only the indexes of change for periods 1961 – 1970 – 1980 – 1990 – 1995 are presented.

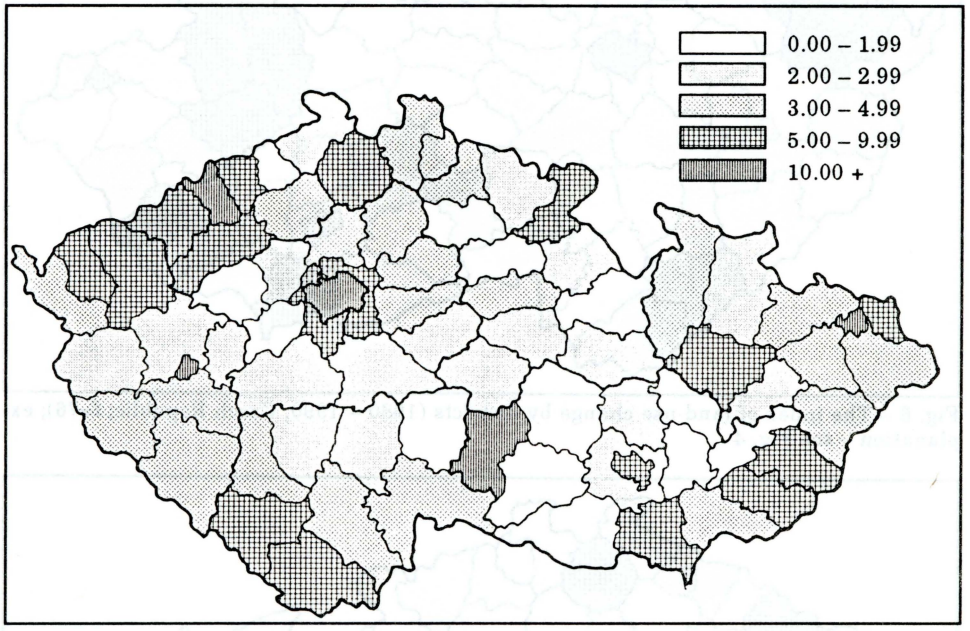

Fig. 4 – The index of land-use change by districts (1961 – 1970, Czech Republic; f=76)

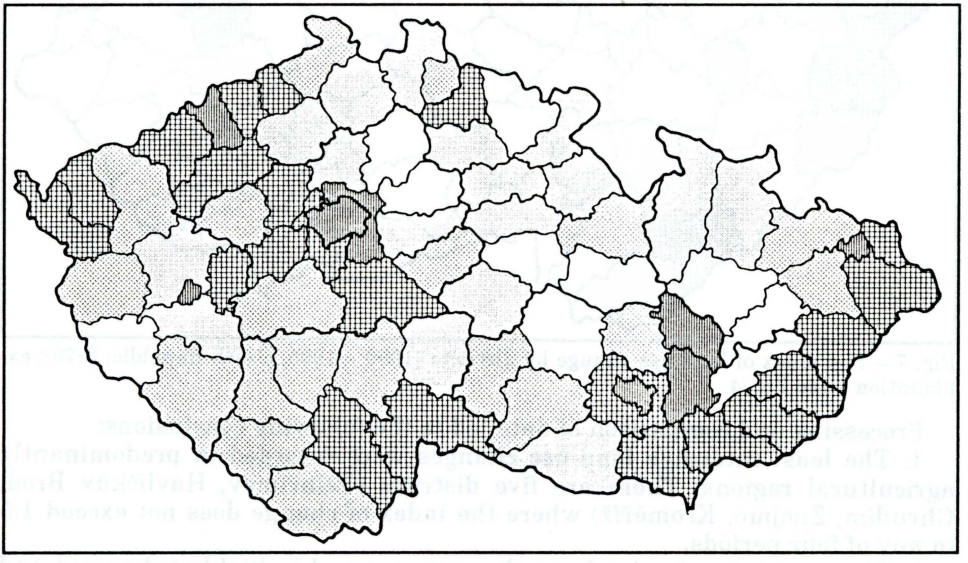

Fig. 5 – The index of land-use change by districts (1970 – 1980, Czech Republic; f=76); explanation – see Fig. 4

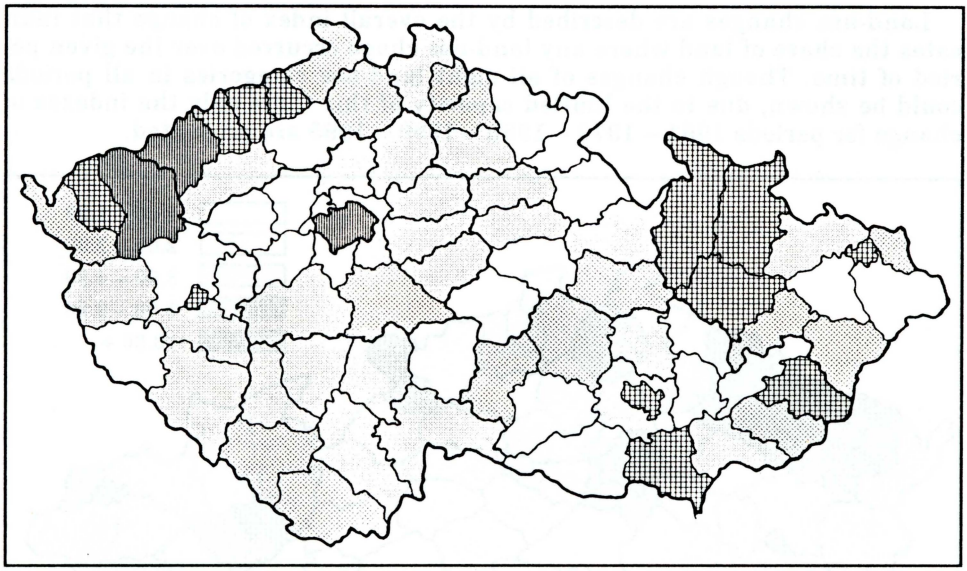

Fig. 6 – The index of land-use change by districts (1980 – 1990, Czech Republic; f=76); explanation – see Fig. 4

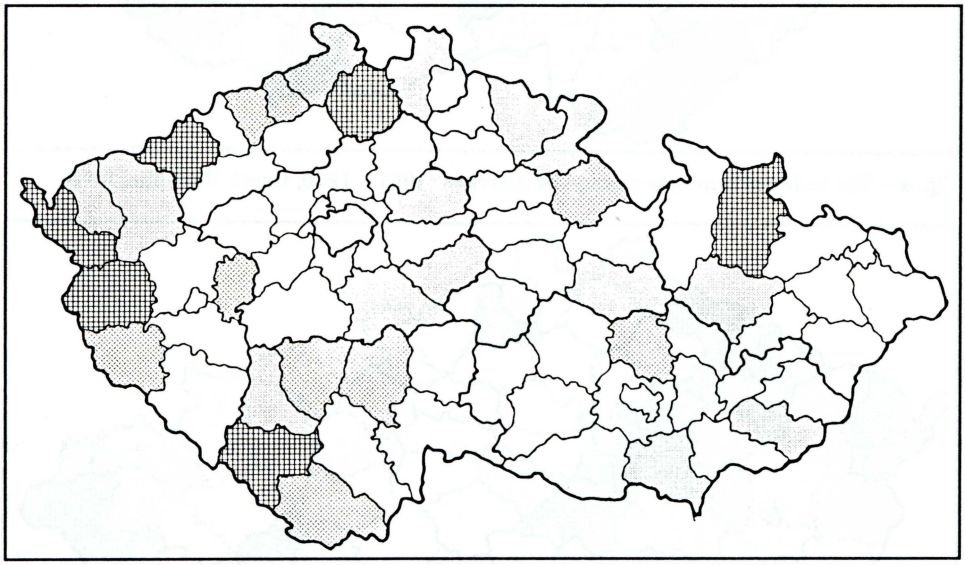

Fig. 7 – The index of land-use change by districts (1990 – 1995, Czech Republic; f=76); explanation – see Fig. 4

Processing and comparison of data led to the following conclusions:

1. The least intensive land-use changes were recorded in predominantly agricultural regions. There are five districts (Pelhřimov, Havlíčkův Brod, Chrudim, Znojmo, Kroměříž) where the index of change does not exceed 1.5 in any of four periods.

2. The most intensive land-use changes occurred in highly urbanized and industrialized districts (Prague, Plzeň, Teplice, Ostrava, Karviná).

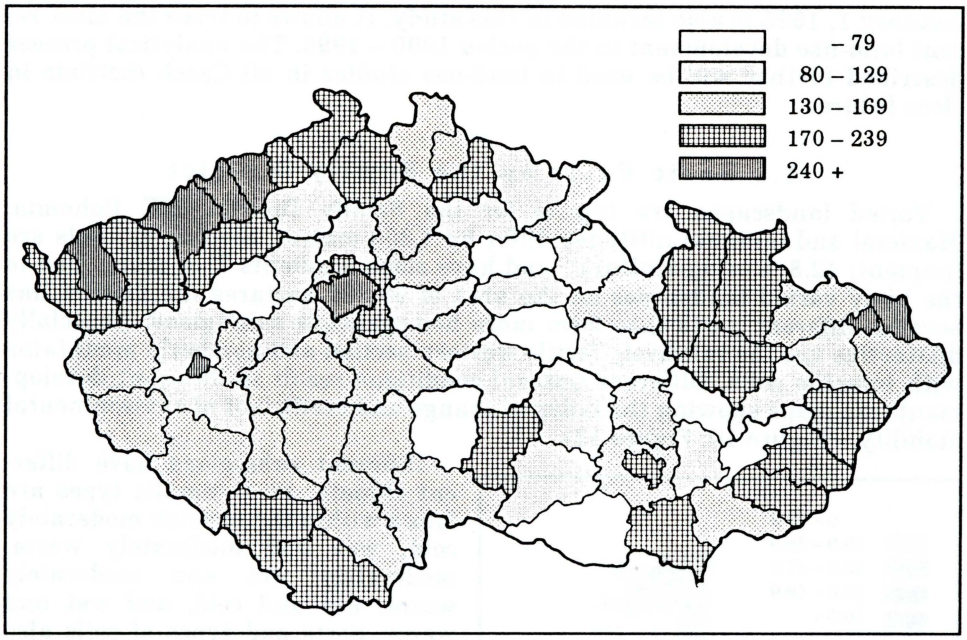

Fig. 8 – Summed ranks by the index of change in four periods (Czech districts 1961 – 1970 – 1980 – 1990 – 1995)

3. Quite important land-use changes were also recorded in districts adjoining the western and south-western boundary.

4. Figures 4-7 show the large regional differences of land-use development. Districts where indexes exceed the value of 10 are regions with the most damaged environment. Land-use changes affecting more than one tenth of the total area are supposed to much contribute to the overall environmental imbalance. However, the vice-versa scenario might make sense, too: intensive land-use changes as the result of damaged environment? The same figures also show intensive changes in most Moravian districts as well as relatively stable conditions in the Bohemian-Moravian Highlands.

Different approach has been used in the case of Figure 8. Ranks by the index of change in all four periods are summed up; each district is given one number. In our opinion this figure shows best the land-use changes over the whole period 1960 – 1995. The most intensive changes are recorded in districts with the most damaged environment and in big cities – Prague and Plzeň.

4. Land-Use Changes at Detailed Scale: Case Study Semily District 1845-1995

The above mentioned methodology of assessing land-use changes has been applied in the Semily District. In this case study more attention has been devoted to parameters indicating the environmental quality of cadastral units. (For details on coefficients of environmental stability and recreational suitability see further text.) Land-use data by cadastral units of

January 1, 1995 is also included in this study. It allows to trace the most recent land-use development in the period 1990 – 1995. The analytical process described further will be used in land-use studies in all Czech districts in close future.

4.1 Basic Facts on the Semily District

Varied landscapes are typical for the Semily District, NE Bohemia. Maximal and minimal altitudes differ by 1,300 metres. Sloping grounds are frequent; 42.8 % of agricultural land have slope gradients 7° or more. Due to the higly varied landscapes on the area of 69,887 hectares the district has several different parts that form more homogeneous subregions. Especially distinctive are the relatively fertile western section and northerly mountains with infertile soils. Different natural conditions result in different development (see maps showing the index of change and coefficient of environmental stability – Figure 10, Figure 12).

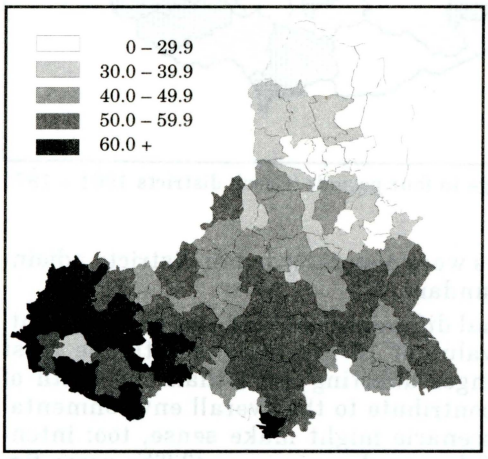

Fig. 9 – Productional ability of soils in the points (% from most productiv soils in the Czech Republic; (case: Semily region)

Different subregions have different climate. Five climatic types are found within the district: moderately cold, wet and moderately warm, moderately wet and moderately warm, wet and cold, and wet and warm. Sorts and types of soils also vary. Brown soils on crystalline and Permian rocks are most frequent. Soils are of medium density mostly, thickness vary from medium to low, with medium share of gravel and stones. The low quality of soils results in low productional ability of agricultural land. This ability has been calculated as the average value of all Soil Value Units (SVU) by cadastres compared with the most fertile SVU in the state. Using this method the Semily District got 43.5 points and ranks to the 64th position out of 76 Czech districts. The average soil value in financial terms amounts to 35,480 CZK per 1 hectare only (the national average is 55,096 CZK/1 ha). The share of arable land out of agricultural land is only 59 %; the same figure for Czechia, however, is 81.6 %. There are some restrictions that contribute to the low share of arable land: National Park Krkonoše manages 11.1 % of agricultural land, and 22.6 % of land is under special treatment due to protection of underground water.

4.2 Development of the Land-Use Structure in the Semily District

General land-use changes are described by the index of change. Indexes for the periods 1845 – 1948, 1948 – 1990, and 1990 – 1995 are shown in Figure 10. It is apparent that changes that occurred over one hundred years between 1845 and 1948 were far less intensive than changes in the second half of the 20th century.

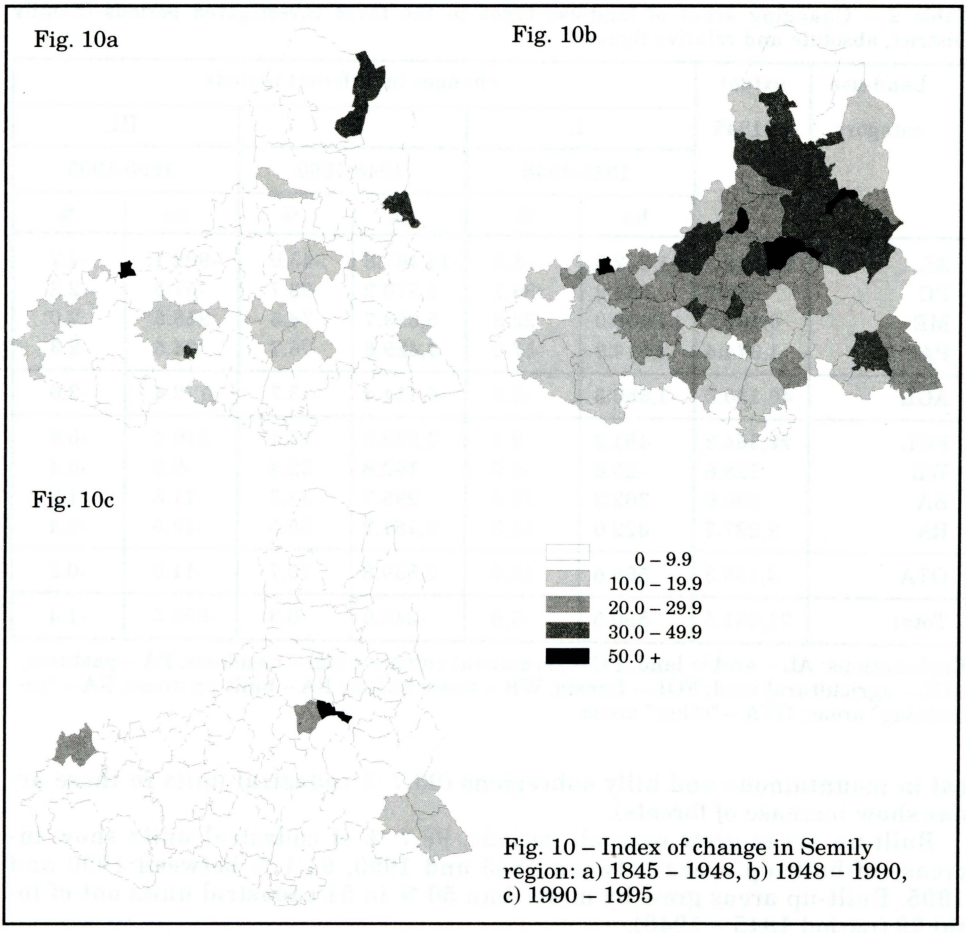

Fig. 10 – Index of change in Semily region: a) 1845 – 1948, b) 1948 – 1990, c) 1990 – 1995

4.3 Changing Patterns of Individiual Land-Use Categories

Following a slight decrease in the first period (by 3.6 %), the extent of agricultural land has much decreased after 1948 (by 13.7 %). Only arable land, however, was decreasing in the framework of agricultural land. Intensive increase of meadows, pastures, and permanent cultures was recorded in the period 1948 – 1990. Nevertheless, pastures still occupied less land than in 1845. In the most recent period subsidies encouriging the conversion of arable land into meadows and pastures have already been effective. It was expected that the extent of meadows and pastures would rise. This conversion, however, was only modest in the Semily District and did not exceed 5 %; pastures even decreased. At the national level the Semily District was below average in this respect (See Figure 11a). The extent of permanent cultures has decreased between 1990 – 1995 – first time since 1845. This was due to the decrease of orchards in the southern part of the district.

Forests grew in terms of size slightly only in the first period and significantly in the second period (by 14.1 %, i.e. 3229 ha). Slight decrease has been recorded recently. The expansion of forests between 1948 and 1990 was typi-

Table 2 – Changing areas of land-use types in the three investigated periods (Semily District, absolute and relative figures)

Land-use category	extent of 1845	changes in different periods					
		I.		II.		III.	
		1845-1948		1948-1990		1990-1995	
		ha	%	ha	%	ha	%
AL	34,883.3	-1,212.3	-3.5	-14,467.8	-43.0	-902.1	-4.7
PC	690.9	664.2	96.1	1,270.2	93.7	-57.5	-2.2
ME	6,182.2	1,408.0	22.8	5,653.7	74.5	258.6	2.0
PA	4,374.4	-2,510.3	-57.4	4,429.6	76.7	-74.5	-2.3
AGL	46,130.9	-1,650.3	-3.6	-6,114.4	-13.7	-772.4	-2.0
FOL	22,364.3	461.2	2.1	3,229.6	14.1	-210.1	-0.8
WB	528.8	-25.8	-4.9	162.8	32.4	-2.9	-0.4
BA	380.0	302.3	79.6	295.7	43.3	11.5	1.2
RA	2,227.7	322.0	14.5	2,181.2	85.5	-19.5	-0.4
OTA	3,136.3	598.6	19.9	2,639.8	70.7	-11.0	-0.2
Total	71,631.5	-590.5	-0.8	-245.0	-0.3	-993.5	-1.4

Explanations: AL – arable land; PC – permanent cultures; ME – meadows; PA – pastures; AGL – agricultural land; FOL – forests; WB – water bodies; BA – built-up areas; RA – "remaining" areas; OTA – "other" areas.

cal in mountainous and hilly subregions (93.7 % cadastral units in these areas show increase of forests).

Built-up areas grew over all periods. 98.7 % of cadastral units show increase of built-up areas between 1845 and 1990, 91.1 % between 1990 and 1995. Built-up areas grew by more than 50 % in 51 cadastral units out of total 79 (period 1845 – 1948).

So called "remaining" areas consist of different types of plots. Increases in terms of size were recorded between 1848 – 1990; recently there has been a slight decrease.

4.4 Environmental and Recreational Potentials Over the Time

The coefficient of environemtal stability has constantly grown within the Semily District over all investigated periods (see Figure 12). The coefficient of recreational suitability shows similar development, though the increase is somewhat slower.

It is important to emphasize that calculations are based on the recorded extent of land-use categories. Areal increase of land-use types that are in theory environmentally valuable does not necessarilly mean that environmental quality is really improving. Let us take forests as an example. Forests are regarded as the land-use category with the highest environmental quality. In practical terms, however, many forests especially in elevated parts of the Semily District are much damaged. As a result the recorded size of forest land is not automatically covered by quality forests. Increase in size may not be increase in environmental quality.

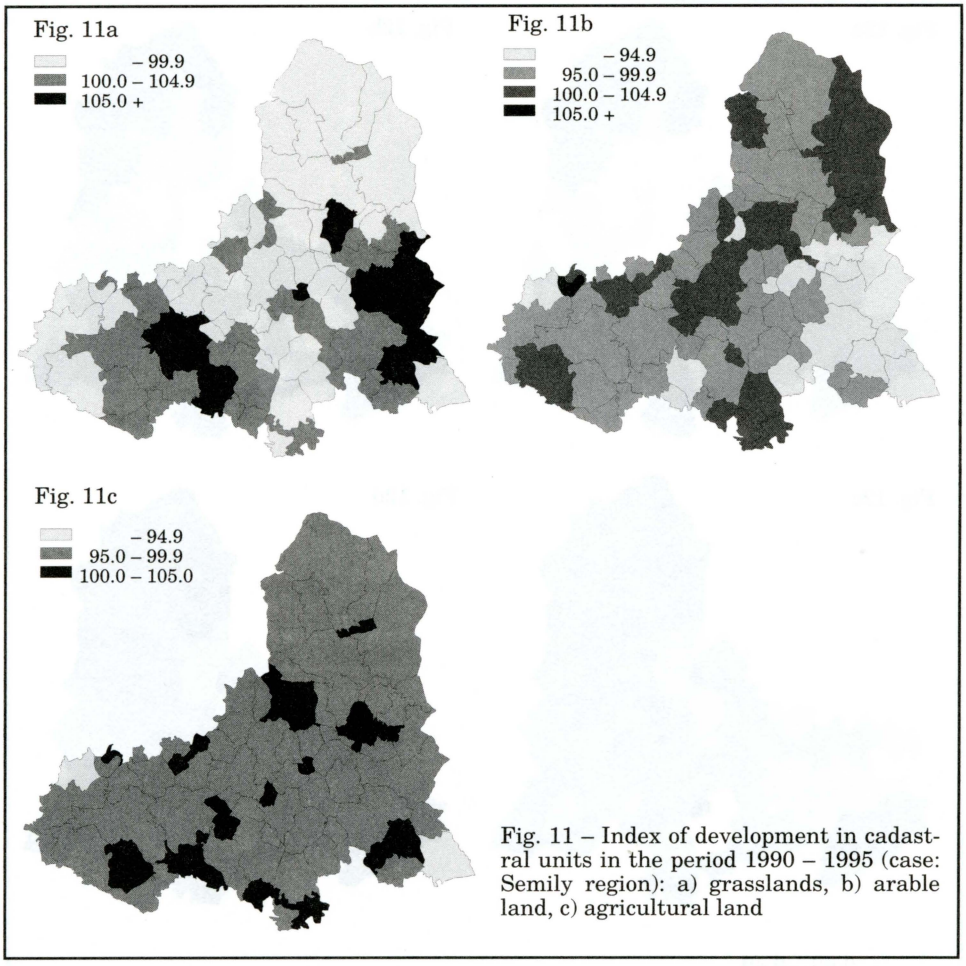

Fig. 11 – Index of development in cadastral units in the period 1990 – 1995 (case: Semily region): a) grasslands, b) arable land, c) agricultural land

4.5 Conclusions

The analysis of long-termed land-use development in the Semily District reveals some important trends. Development of three land-use categories show clear tendencies over all investigated periods:

The extent of arable land has been decreasing constantly. The most intensive relative decrease has been recorded between 1948 and 1990 (in average 344.4 ha per year). The average annual decrease between 1845 and 1948 amounted only to 11.7 ha and the same figure for the most recent period was 180.4 ha.

On the contrary, constant increse has been recorded in the case of built-up areas and meadows.

Built-up areas grew fast especially in the period 1948 – 1990 (in average by 7 ha per year). The mean annual increase between 1845 and 1948 is almost identical with the recent period 1990 – 1995 (3 ha and 2.3 ha respectively).

Also the extent of meadows has increased most in the period 1948 – 1990 (in average by 134.6 ha per year). At present (i.e. between 1990 and 1995) meadows still tend to grow in terms of size. This recent increase is four times

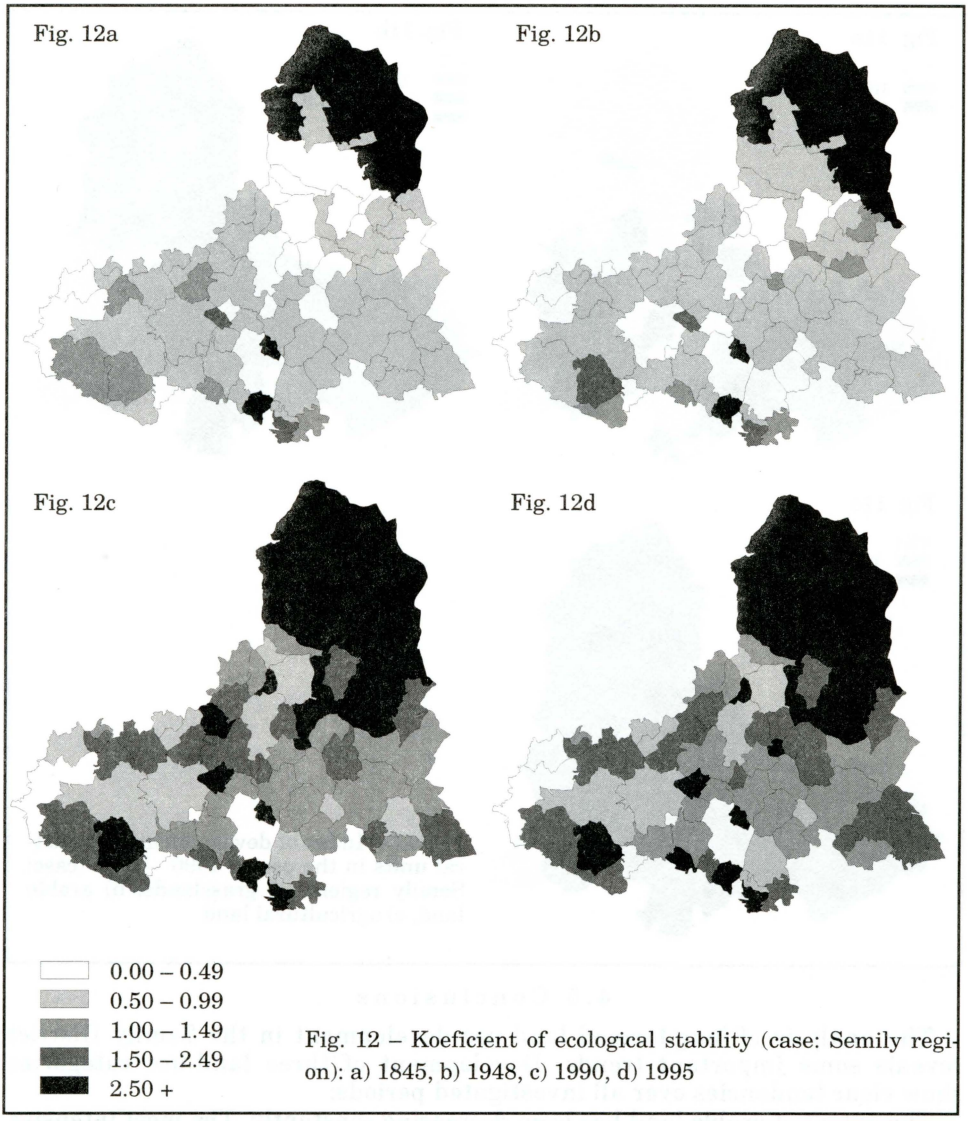

Fig. 12 – Koeficient of ecological stability (case: Semily region): a) 1845, b) 1948, c) 1990, d) 1995

faster than in the earliest recorded period, but three times slower compared with the period 1990 – 1995.

The above mentioned tendencies provide a sound base which allows us to describe all three investigated period. The earliest period (duration over 100 years) is typified by slow and slight land-use changes that have altered the landscapes of Semily District at a modest scale only. On the contrary, the 42 years long period after 1948 was a "fast" one resulting in fundamental changes of land-use patterns and landscape on whole. Consequences of these fast processes are apparent everywhere.

The period 1990 – 1995 is a relatively short one. Important political and social changes, however, have taken place recently. In our opinion they could result into faster landscape changes. The most recent land-use changes seem

to be generally infavourable (for instance the decrease of forests which has never before been recorded); in most cases, however, reasons and motives are not yet clear. Since land-use records show some inertia the current data may still reflect processes that have happened before 1990. Landscapes changes are for sure slower that social changes. If one takes the Semily District as an example, at least some new tendencies in the use of land can be observed. Let us quote the significant increase of meadows which is probably linked with the decrease of arable land and with the increase of "remaining" areas. Only land-use analysis from other districts, however, could prove whether these tendencies have general validity or not.

References:

BIČÍK I., ŠTĚPÁNEK V. (1994 a): Post-War Changes of the Land Use Structure in Bohemia and Moravia. GeoJournal 32, 3, pp. 253-259.

BIČÍK, I., ŠTĚPÁNEK, V. (1994 b): Long-Term and Current Tendencies in Land-Use: Case Study of the Prague's Environs and the Czech Sudetenland. Acta Universitatis Carolinae – Geographica, XXIX, No. 1, UK, Praha, pp. 47-66.

BIČÍK, I. (1988): Areas structure development in the Northern Bohemia Region as the Reflection of Society – Environment Relation. In: Historical Geography, Vol. 27, Praha, ICWH CSAS, pp. 199-223.

BIČÍK, I. (1992): Long Term Tendencies of Land Use in the Czech Republic. In: Acta Universitatis Carolinae – Geographica, XXVII, No. 1, UK, Praha, pp. 59-63.

BIČÍK, I. (1995): Possibilities of Long-Term Human-Nature Interaction Analysis: The Case of Land-Use Changes in the Czech Republic. In: Simmons I. G., Manion A. M. (ed.): The Changing Nature of the People – Environment Relationship: Evidence From a Variety of Archives. Proceedings of the IGU Commission on Historical Monitoring of Environmental Changes Meeting. Praha, pp. 79-91.

de BIE C. A., ZUIDEMA P. A. (1995): The Land Use Database. A Knowledge Based Software Program for Structured Storage and Retrieval of User – Defined Land Use Data Sets. Paper presented at the conference of the IGU :Global Changes and Geography.

Československá statistika, Vol. 87, Part I, Praha, 1932-1933.

Ergebnisse der Katastralrevision auf Grund des Gezetzes vom 12. Juli 1896. Reichsgesetzblatt 121, Wien, 1900.

GÖTZ, A. (1994 a): Regional Diferences in Transformation of Czech Agriculture after 1989. Sborník ČGS, 99, No. 2, pp. 93-100.

GÖTZ, A. (1994 b): Regional Inequalities in Agricultural Transformation in the Czech Republic. Acta Universitatis Carolinae – Geographica, XXIX, No. 1, UK, Praha, pp. 19-29.

HÄUFLER, V. (1960): Evidence of the Land Use in Czechoslovakia. Sborník ČSZ, 65, pp. 268-272.

JANČÁK, V. (1995): Dynamic of Land-Use in the Southern Outskirts of Prague – Case of Příbram District. In: Simmons I. G., Manion A. M. (ed.): The Changing Nature of the People-Environment Relationship: Evidence from a Variety of Archives. Proceedings of the IGU Commission on Historical Monitoring of Environmental Changes Meeting. Praha, pp. 73-79.

JELEČEK, L. (1985): Zemědělství a půdní fond v Čechách ve 2. polovině 19. století. Academia, Praha, 283 p.

JELEČEK, L. (1984): Main Historical Changes in Spatial Organization of Agriculture in Bohemia in the 2nd Half of the 19th Century. In: Historical Geography, Vol. 23,ICWH CSAS, Praha, pp. 171-218.

JELEČEK, L. (1995): Changes in the Production and Techniques in the Agriculture of Bohemia 1870-1945. In: Havinden, M. A., Collins, E. J. T. (ed.): Agriculture in the Industrial State. University of Reading, Rural History Centre, Reading, pp. 126-145.

JELEČEK, L. (1993): The Land Fund Structure Changes in the Czech Lands 1845-1990: Some Historical and Environmental Consequences. University of Kansas, Rockefeller Program in Nature, Culture, and Technology 1993. Lawrence, 11 p., 7 app. (Mimeographed).

JELEČEK, L. (1994): Long Term Land Use Changes in the Czech Republic 1845-1990: Some Historical and Environmental Connections. IGU Regional Conference Prague 1994 Proceedings on CD ROM, Praha.
KOTLYAKOV, V.; MESSERLI, B.; VERSTAPPEN, H. T. (1995): Global Changes and Geography. Conference of the IGU Keynote Address, Moscow, August 14-18, 1995, 4 p.
KUBA, B., OLIVOVÁ, O. (1993): Katastr nemovitostí. Nakladatelství Vilímek, Jihlava, 149 p.
MAŠEK, F. (1948): Pozemkový katastr. Soupis, popis a geometrické zobrazení pozemků ČSR. Ministerstvo financí, Praha, 223 p.
NOVÁK, V. et al. (1925): Přirozené zemědělské krajiny a výrobní oblasti v republice Československé. Čs. statistický věstník 6, part 2-6, pp. 5-214.
POKORNÝ, O. (1959): Obraz Čech v polovině 19. století v díle stabilního katastru. Sborník ČSZ, 64, pp. 222-231.
POKORNÝ, O. (1970): Výzkum vývoje životního prostředí srovnávací historicko-geografickou metodou. Sborník, ČSZ 75, pp. 23-31.
POKORNÝ, O. (1972): Einige Aspekte über die Historische Entwicklumg der Bodenausnützung in Böhmen. Symposium of agricultural typology. Szeged-Pécs 1971, Papers, Szeged, pp. 316-328.
RADA, J. (1971): K některým otázkám vztahů mezi přírůstky lesní půdy a úbytky zemědělské půdy. Čs. ochrana přírody, 11, pp. 75-99.
Stabilní katastr. Obraz zemědělství v Čechách v polovině 19. století z pohledu oceňovacího operátu. Praha, Geodetický ústav ÚSGK 1979.
Statistická ročenka o půdním fondu v ČSSR podle údajů evidence nemovitostí. ČÚGK, SÚGK, Praha, 1970.
Statistická ročenka Republiky Československé 1934. Státní úřad statistický, Praha.
ŠTĚPÁNEK, V. (1992): The Iron Curtain and Its Impact on the Environment in the Czech Republic. In: Acta Universitatis Carolinae – Geographica, XXVII, No. 1, UK, Praha, pp. 59-63.
Tafeln zur Statistik der Land und Forstwirtschaft des Königreiches Böhmen. Auf Grundlage amtlicher Quellen. Band I., Heft 1-13, Praha, 1861-1881.
Ústřední archív zeměměřictví a katastru Praha. Výpisy úhrnných katastrálních hodnot druhů pozemků v k.ú. ČR pro roky 1845 a 1948; sumární výpis pro r. 1882.

Shrnutí

ZMĚNY VYUŽITÍ PLOCH ČESKÉ REPUBLIKY V LETECH 1845 – 1995

Článek řešitelů projektu grantové agentury ČR je zaměřen na presentování základních myšlenek projektu "Dlouhodobé změny využití ploch v ČR". Krátce seznamuje s datovou základnou a metodologií projektu (dříve publikované podrobněji Bičík, I., 1995) a využívá rozpracovaného postupu ve dvou úrovních.

Především analyzuje pomocí jednoho ukazatele – indexu změny – intenzitu změn struktury ploch v různých časových horizontech po úroveň okresů. Nejprve jde o okresy z let 1860 – 1896 – 1930 (f=218) a jejich seskupení do tzv. produkčních zemědělských regionů. V tabulce 1 jsou zachyceny změny ve třech obdobích a dokumentují opoždění v prosazování tržních vztahů v jednotlivých oblastech. Oblast Orlických a Krušných hor vykazuje nejvyšší index změny, v letech 1896 – 1930 hodnoty dosahují 11,17 % a 15,82 % ploch, na nichž se změnil způsob využití. Vzhledem k délce období jde o poměrně výrazné změny, jejichž ekologický dopad lze hodnotit jako příznivý (zvětšení rozsahu lesních ploch a drnového fondu především!). Dále jsme analyzovali okresy (f=76) v období 1961 – 1995 po deseti letech, resp. po pěti letech, podle stejného ukazatele – indexu změny. Tím byly určeny okresy s nejmenším a největším indexem změny, který chápeme jako zprostředkovaný obraz interakce společnost – příroda. Nejnižší změny na úrovni pod 2 % za desetiletí vykazují agrární okresy (Pelhřimov, Havlíčkův Brod, Chrudim, Znojmo, Kroměříž), naopak nejvyšších hodnoty pak vykazují územní jednotky s těžebním a dalším průmyslem (Teplice, Ostrava, Karviná) a jádra metropolních oblastí (Praha, Plzeň). Série kartogramů podává podrobnější regionální informace o tomto jevu po jednotlivých obdobích a jejich souhrn.

Druhou úroveň představuje detailní rozpracování metodiky analýzy dlouhodobých změn struktury ploch v okrese Semily. Série kartogramů podává informace o vývoji rozlohy jednotlivých ploch v letech 1845 – 1948 – 1990 – 1995, o vývoji celkové struktury a dalších statických i dynamických charakteristik za tzv. základní územní jednotky. Základní územní jednotky představují srovnatelné jednotky z hlediska neměnné celkové rozlohy ve všech sledovaných letech. Jsou to buď jednotlivá katastrální území, či spojené dvě a více původních katastrálních území (mezi nimiž došlo k výměně části ploch, které není možné zjistit) z důvodů srovnatelnosti. Tato ukázka na příkladě jednoho okresu představuje nejen analýzu vývoje struktury ploch daného území podle základních územních jednotek, ale naznačuje širokou škálu možností využití této datové základny k podrobným mikro– a mezoregionálním analýzám. Řešitelský kolektiv představeného projektu pracuje na zpracování dalších okresů ČR s perspektivou zpracování a vyhodnocení vývojových tendencí v celé ČR. Právě tímto způsobem chceme využít zcela ojedinělé základny dat v ČR a připojit se k projektu Land Use/Cover Change – LUCC. Ten byl schválen Mezinárodní Geografickou unií jako významný mezioborový projekt v roce 1995.

Obr. 1 – Vývoj průměrného ročního indexu změny struktury ploch v letech 1845 – 1990 v České republice. Osa x – roky; osa y – průměrný roční index změny.
Obr. 2 – Přirozené krajiny (rok 1900) a výrobní zemědělské oblasti (rok 1930). 1 – hranice oblastí; 2 – hranice krajin; 3 – krajiny; 4 – oblast řepařská; 5 – oblast obilnářská; 6 – oblast obilnářsko-bramborářská; 7 – oblast pícninářská. Pramen: Novák, V. a kol., 1925.
Obr. 3 – Index změny struktury ploch Čech v letech 1860 – 1896 podle soudních okresů (f=218)
Obr. 4 – Index změn struktury ploch mezi lety 1961 – 1970 (podle okresů ČR; f=76)
Obr. 5 – Index změn struktury ploch mezi lety 1970 – 1980 (podle okresů ČR; f=76)
Obr. 6 – Index změn struktury ploch mezi lety 1980 – 1990 (podle okresů ČR; f=76)
Obr. 7 – Index změn struktury ploch mezi lety 1990 – 1995 (podle okresů ČR; f=76)
Obr. 8 – Souhrn změn struktury ploch za čtyři sledovaná období podle součtu pořadí okresů v jednotlivých letech (f=76)
Obr. 9 – Produkční schopnost půdy v bodech (vůči nejúrodnějším půdám v ČR; okres Semily)
Obr. 10 – Index změny v okrese Semily: a) 1845 – 1948, b) 1948 – 1990, c) 1990 – 1995
Obr. 11 – Indexy rozlohy vybraných kategorií využití ploch podle katastrálních území okresu Semily v období 1990 – 1995: a) trvalé travní porosty, b) orná půda, c) zemědělský půdní fond
Obr. 12 – Koeficient ekologické stability v okrese Semily: a) 1845, b) 1948, c) 1990, d) 1995

(Authors are with Dpt. of Social Geography and Regional Development, Faculty of Science, Charles University, Albertov 6, 128 43 Praha 2.)

Arrived to the editor's office on February 16, 1996
Recommended for publication by Václav Frajer and Václav Gardavský

GEOGRAFIE – SBORNÍK ČESKÉ GEOGRAFICKÉ SPOLEČNOSTI
ROK 1996 • ČÍSLO 2 • ROČNÍK 101

JAN PTÁČEK

CZECH AGRICULTURE IN TRANSITION

J. Ptáček: *Czech Agriculture in Transition.* – Geografie-Sborník ČGS, 101, 2, pp. 110 – 127 (1996). – The article deals with the transition and transformation of Czech agriculture. The character of post-1990 systemic changes is defined. Chief goals of the state agricultural policy are described as well as the impacts of radical economic reform on the agricultural production. The following processes are analysed: 1) Restitution – return of property to the original owners or to their heirs; 2) Transformation – property transfer from the cooperatives to private subjects (individuals and companies); 3) Privatization – denationalization and privatization of the former state farms. The last chapter focuses on the privatization of Žihle State Farm (West Bohemia) as a detailed case study.
KEY WORDS: agriculture in the Czech republic – transition – cooperative – state farm.

1. Introduction

Czech Republic has come to existence on January 1, 1993 after the dissolution of former Czechoslovakia. Its total area is 78, 900 km^2; agricultural land occupies 42,800 km^2, arable land 31, 600 km^2. Thus, the share of arable land on agricultural land (73.77 %) is by European standards relatively high. Forests (26, 300 km^2), lakes and other water areas (16,000 km^2) have a substantial economic significance, too.

Rolling, undulating highlands and uplands form the most common landscape type. Climate is moderately warm with prevailing subcontinental character. Continental climatic features rise in importance with increasing distance from the ocean, from west to east. Annual precipitation varies between 500 and 750 mm; altitudes are between 140 m (in lowlands) and 1, 600 m in the mountains.

Czech agriculture has much worse conditions – regarding climate, soils, and landscapes – than most West European countries. Western Europe enjoys maritime climate, moderate temperature range, higher humidity, and longer vegetative season. Moreover, some 10,000 km^2 of Czech agricultural land occurres in areas with specific conditions: in National Parks, Protected Landscape Areas, in regions with special protection of surface and underground water, and also in heavilly polluted areas.

Czech agriculture concentrates on typical products of the mild climatic zone. Cereals are grown on almost one half of all arable land (mostly wheat and barley). Rape seed and fodders are important, too. Livestock production focuses on dairy farming, cattle, pigs, and poultry.

Agricultural policy before 1989 was mostly concerned with self-sufficiency in products of mild climatic zone. Low and fixed food prices were kept, and incomes in the agricultural sector were equally distributed. In practical terms only two ownership types existed (cooperative and state one) and land was managed by two different bodies: by cooperative farms and state farms. Private farming was negligible.

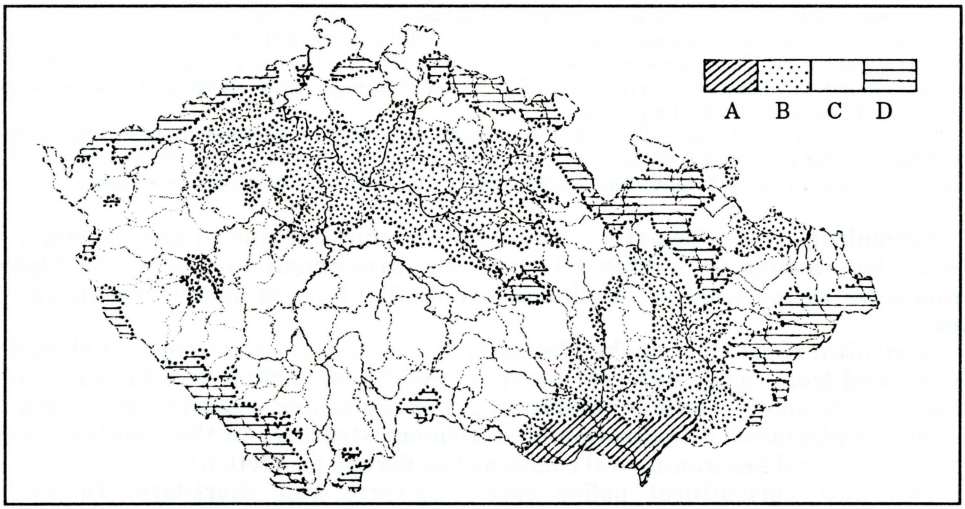

Fig. 1 – Czech agricultural regions. Regions: A – maize growing, B – sugar beet growing, C – potato growing, D – hilly regions. Fifty years ago Bohemia and Moravia have been divided to four basic agricultural regions typified by characteristic – though not the most widespread – crops. The division is based on the land fertility. Following agricultural regions were delimited: A – maize regions. These are the parts of Southern Moravia warm enough for maize to get ripe. B – sugar beet regions. Flat and warm areas not included in A where sugar beet is grown for sugar. The most fertile region of all. C – potato regions. Highlands and uplands prevail; it covers the largest part of the Czech Republic. D – hilly regions where mostly fodders and forage are produced. High share of meadows and pastures is typical. More recent agricultal regionalization based on the pedological research has been carried out in the 1960. The above mentioned agricultural regions, however, are still much in use.
Map and commentary: Antonín Götz

Political changes in the end of 1989 have started the process of transition of Czechoslovak (Czech) economy from the centrally planned system towards a market one which should secure a long-term economic prosperity.

The fundamental Scenario of Economic Reform has been approved in 1990. Its ultimate aim is the reintroduction of market economy and includes the following systemic changes:

– privatization of most stately owned establishments in the field of industry, services, agriculture, and in other branches;

– liberalization of retail and production prices;

– internal convertibility of Czechoslovak currency (regarding financial flows on current accounts);

– liberalization of external economic relations.

Radical economic reform, shift towards market economy and, first of all, denationalization and privatization has pushed stately owned business into quite different economic

Table 1 – Agricultural businesses in the Czech Republic

	number	average holding (hectares)	% of agric. l. in Czechia
Private Farmers	3,205	4	0.4
Cooperatives	1.024	2,561	61.4
State Farms	174	6,261	25.3
Other Companies	.	.	12.9
Total	.	.	100.0

Source: Zpráva o stavu českého zemědělství 1994 (Report on the State of Czech Agriculture 1994)

conditions. Under the old regime, business abilities of all kinds including enterprising itself were supressed and ordinary, unimaginative solutions were limited. Alternative ways that could solve problems were not welcomed. Suddenly, all this has changed: market competition began to play an important role. The influx of foreign investments and competition of foreign firms accelerate the process.

It will take a lot of time till market conditions will fully be adopted. Large companies that have so far been doing "business" on socialist principles facing no real competition find the shift towards market conditions exceptionally difficult in all economic branches.

Agricultural transformation is especially important due to specific conditions that include ownership relations, low investment turn-over and high number of agricultural establishments that often have multi-sectoral character.

Agricultural policy is the key factor in the process of transition that should be viewed from many different perspectives. These include legislation, production, economic relations (markets, prices, subsidies, exports), social concerns (employment, stabilization of settlement structure in the country), organization, and environmental concerns (landscape protection).

The new agricultural policy sets long-term and short-term targets. Systemic change of the whole agricultural sector and rapid transition were among the short-term aims. The process of transition should result in:

– establishing of new private farms under the condition of settled ownership rights (regarding land and agricultural property);

– higher efficiency, competitiveness, and market orientation;

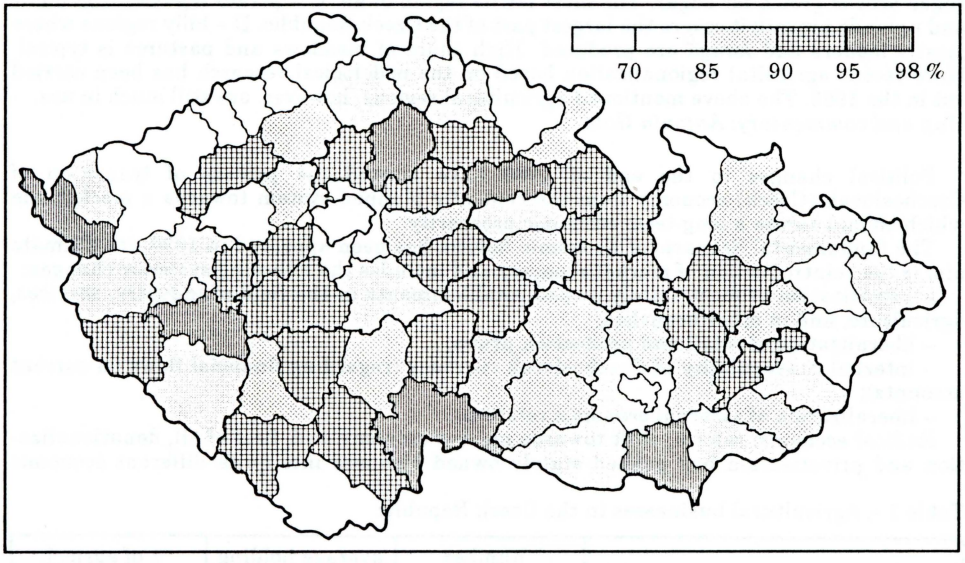

Fig. 2 – Agriculture in transition: agricultural land owned by private farmers, transformed cooperatives, and privatized state farms (percentage of total agricultural land, January 1, 1994). The map shows the share of land that already has been privatized (or, in case of cooperatives, transferred to companies). At the national level this share amounts to 96 %. The rest is state property: residual state farms, school farms, and military farms. Transformed types of land ownership prevail in all Czech regions with the exception of North-West Bohemia where the process of transition has been slower due to devastated landscapes and complicated restitution claims. Similar situation resulting from unfinished restitutions is in the Prague's environs.

Map and commentary: Antonín Götz

– securing of stable market conditions;
– improvement of agricultural techniques;
– regional patterns of agricultural production that would reflect natural and market conditions.

Long-term targets have been focused on securing of market orientation, efficiency, and international competitiveness. There are also other priorities: minimization of harmful environmental influences, sustainable development, protection of natural sources, and quality improvements. It has also been stated that agricultural production should retain positive impacts on the environment.

Czech agriculture has been significantly reduced during the transition process. Introduction of market prices has resulted in much lower domestic demand for food. Exports were reduced, too, since some traditional markets were lost, mostly in Eastern Europe. All this caused a decisive pressure that led to basic structural changes. These should include adaptation of Czech agriculture to current domestic needs and to international markets. Agricultural employment has been reduced by one half; on the other hand, labour efficiency has increased.

The share of agriculture on the national economy in between 1989 and 1994 has decreased by 50 % to just 3 % of GDP. Agricultural employment has gone down from 9.4 % (1989) to 5.1 % (1994). Labour force have moved to other economic branches. Many of these former "farmers", however, were not true agricultural employees: they were engaged – in the framework of cooperative and state farms – as drivers, builders, mechanicians, etc. and often had better working conditions there than industrial plants, transport or building firms could offer.

Gross agricultural production of 1994 has amounted just 72.2 % of the 1989 figure. Consumption has decreased dramatically, too: in case of beef and milk by some one third.

Changes in ownership and legal relations are among the key aims of the agricultural reform. The following processes are included:

1) Restitutions – return of the nationalized property to original owners or their heirs;

2) Transformation – transfer of cooperative property to private owners (individuals and companies);

3) Privatization – denationalizatin and privatization of state farms property.

2. Restitutions

Restoration of standard ownership relations belongs to the most pressing problems in the Czech Republic. The restitution process has two main goals: it should compensate – at least partly – past property injuries, and it transfers ownership rights to individual persons. Since the very beginning of the economic transition, restitutions have been viewed as the fastest way how to transfer property in general to individual owners. Great problems emerged, however, in the case of agricultural property, mostly due to the large amount of restituted property and high number of individual claims.

Both movable and immovable properties nationalized after February 1948 became subject to the Restitution Acts. The Act No. 229/1991 is of greatest importance for agriculture since it deals with ownership of land and other agricultural property. It came into action on June 24, 1991.

The idea behind this Act was to compensate some property injuries that concerned previous owners of agricultural and forest property between 1948 and 1989. The Act also should improve cultivation of agricultural land and forests in line with the desirable economic development of rural regions. Environmental concerns are taken into account, too.

The Land Act consists of four parts. First, the scope of this Act, ownership rights, and users rights concerning the land and products grown on it are determined. Second, it specifies individuals and companies subject to this Act, legal instruments necessary for restitution claims, plots that can not be restituted, legal deadlines, and compensations for buildings, permanent cultures, and plots that can not be physically restituted. The third part determines the activity of the Privatization Fund. The Part Four then enacts special, temporary, and final regulations concerning compensations for farm stock (animals and equipment) and permanent cultures. Legal rights of owners of buildings and plots are specified, as well as the relations towards church land. The last article concerns the past land reforms. Free of charge use of private land has been abolished.

The restitution deadline for immovable properties was first set to December 31, 1992. It has later been extended by one month.

Restitution claims concerning immovable properties – land, residential and non-residential buildings directly related to former estates including built-up plots, outbuildings and structures necessary agricultural production, forestry, and water management – could have been raised by entitled subjects at the Land Office. Liable subjects (holders of the respective property) were asked to return it.

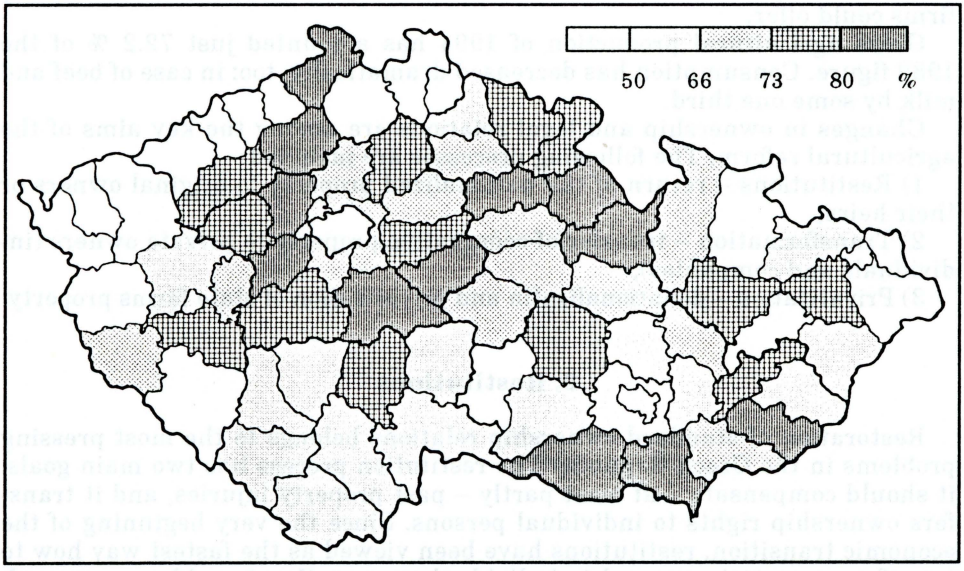

Fig. 3 – Restitution in agriculture: restitution claims and property equilibrium (percentage of satisfied claims in financial terms, January 1, 1994). Restitution of property has been the most problematic matter in agriculture after 1989. The property relations have been balanced quite fast over the past few years; 57.8 % of all claims were satisfied by January 1, 1995. The map reflects the situation one year earlier. Restitution claims are being satisfied rather quickly in the inland. Restitution of agricultural property goes more slowly in the frontier (and also in Prague and other big cities) due to difficulties with justifying the claims. *Map and commentary: Antonín Götz*

Entitled and liable subjects then concluded an agreement concerning the physical property transfer. This had to be officially sanctioned by the Land Office.

It was necessary to identify landowners and owners of other immovable properties as well as legal rights to land and its use, and related regulations.

Historically, Bohemia and Moravia have always had an elaborated system of land records. So called land sheets have existed since the 13th century; the more complex land books came into existence under Maria Theresa. Detailed cadastral mapping has been carried out between 1823 and 1845 (scale 1:2,880), together with records of immovable property. All these records were mostly aimed to protect legal ownership rights.

Until 1951, ownership rights and other rights concerning immovable property became enforceable only after their registration in land books. All contracts on transfer of immovable property must have been legally sanctioned by a court of law. The state and transfers of immovable properties (including maps and legal documents) were recorded by Cadastral Office. In this way, recorded and real state of ownership relations were in good harmony. This principle, however, was abandoned in 1951 when the new Civic Law has become enforceable. Since 1951 written records concerning immovable property were not incumbent any more.

Collectivization brought radical changes: land was partly nationalized and partly transferred to the hands of "socialist organizations". Cadastral Office was in the late 1950 replaced by the so called Unified Land Records – documentation based on the right of use instead of ownership rights.

Next legal change came in 1964. Again, it mostly dealt with the right of use. Land records became enforceable on the base of legal agreements and documents issued by courts, national committees, notaries, and other bodies. These records were mostly intended to serve for planning purposes in agriculture, for statistics related to agricultural and forest land, and for socialist organizations.

January 1, 1993 brought fundamental changes in the field of ownership and other rights concerning immovable properties. The previous system has been abolished and cadastral records have been reinstalled. Local Cadastral Offices came into existence. Renewal of cadastral maps and physical delimitation of plot boundaries are important problems now since landscape character has changed a lot and trigonometrical points largely disappeared. Socialist agriculture amalgamated plots into large units; the Communist ideology abolished the principle of land prices.

The chance to acquire land is of great importance for potential new private farmers. The extent of land that would stay in state hands after restitutions, however, can hardly be judged. Many problems remain unsolved, e.g. restitution of church land. It is estimated that 300,000-400,000 hectares of land will be used as a compensation for plots that are claimed but can not be legally restituted.

The Land Act concerns also compensations for farm stock (animals and equipment) and for store belonging to the original owner that became part of the cooperative property or was commandeered. In such cases, however, agricultural production must be secured. The legal subject or its successor that had acquired the property is responsible for these compensations.

In case it can not be proved that farm stock or store have been commandeered or became cooperative property between February 25, 1948 and January 1, 1990 and if its current value can not be fixed, the following compensations for 1 hectare of agricultural land are used: 1 large livestock unit (animals), 8,500 CZK (fodder, forage, and litter), 1,700 CZK (seed), or 10 tons (manure). The following formula sets compensations for the commandeered equipment: $C_n = M_o x (A_0 x ha + A_1 x ha^2)$. C_n is the total sum; M_o value of 1 hectare in the respective case; A_0, A_1 coefficients, and ha means number of hectares claimed.

Altogether 232,856 restitution claims were raised in agriculture. Thus, the area which is being transferrd to the original owners, equals one sixth of the Czech territory.

All compensations come from the state property. The commandeered property is either physically returned or, in case it does not exist any more, property of equal value is offered. Financial compensations amounted maximally 10,000 CZK; shares of the Restitution Investment Fund can compensate the rest.

The restitution process was slow at the very beginning, partly due to the complexity of claims and due to the limited capacity of Cadastral Offices. 58 % of claims were executed by the end of 1994, and some 95 % by the end of 1995.

3. Transition of Cooperative Farms

Private farming has been much suppressed since 1949 and gradually replaced by collective ownership. Following the Soviet patterns, cooperative farms were forcibly coming into existence. Almost each village had its cooperative by the end of 1950s. Later, the number of cooperative farms decreased since many were amalgamated and the average acreage rose.

Cooperative farms did not own any large amount of state property. Their transition is based on the Act No. 42/1992 (Act on ownership relations and property transfers in cooperatives). This Act is intended to secure principles of democracy, equal rights, and voluntariness and to enable cooperatives to function under market conditions. Based on this Act, cooperatives were obliged to return the property to entitled subjects and new landowners can freely decide how to manage their land.

The transition itself consisted of two parts:

1) execution of ownership claims;

2) transition of cooperatives into other legal subjects.

Ownership claims concerned the private property (mostly land) and also the division of cooperative property. In theory, land has never become cooperative property and legally remained in private hands – though theoretical "owners" could not manage it.

Apart from land also other private agricultural property (namely animals, machines, and various stock) forcibly became part of cooperatives when these were founded. Again, also this property remained in theory in private hands. Distribution of the cooperative property accumulated over the collective era, however, proved to be a difficult task. After having been audited, this property was divided to following parts:

1) 50 % was transferred to landowners (according to acreage);

2) 30 % was transferred to the original owners according to the amount of other property that became part of the cooperative;

3) 20 % was transferred to cooperative members according to how long do they work in it.

Cooperative farms were then transformed into alternative legal subjects, e.g. stock companies or new owners' cooperatives. Until January 28, 1992 all owners must have decided how to manage their land and other agricultural property in future. Such property could be:

a) rented to the transformed cooperatives;

b) managed on private base, either by oneself or by renting to other private farmers.

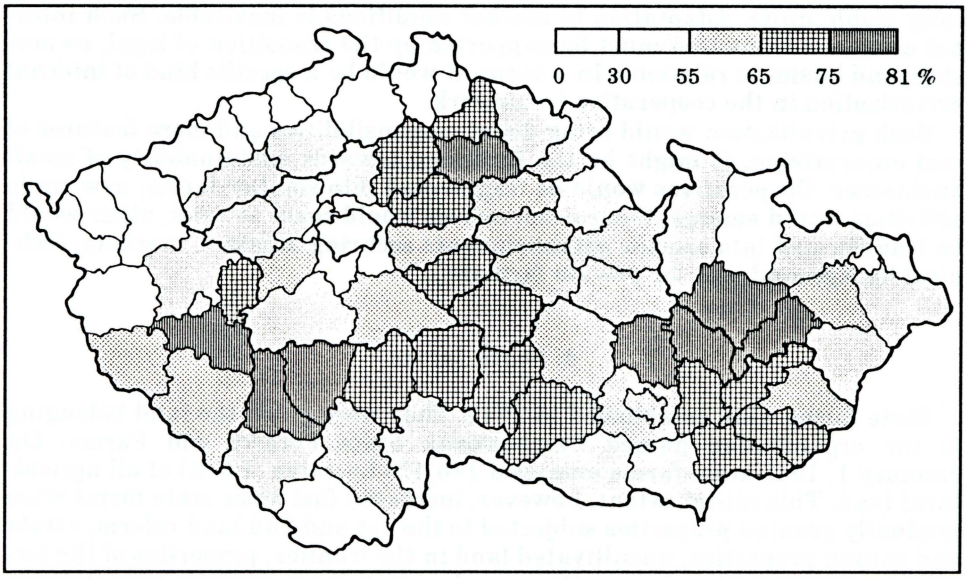

Fig. 4 – Cooperatives in transition: share of agricultural land owned by transformed cooperatives (in percents, January 1, 1994). The former Soviet kolkhoz-type collective farms have been transformed to various types of companies and businesses since 1990. Former collective farms became owners' cooperatives, share companies, trade companies, and other types of establishments. Collective farms were legally obliged to return the land claimed by former owners. The map shows the share of agricultural land managed by the transformed (privatized) cooperatives. This share is low in areas where state farms prevailed under Communism, i.e. in North-West Bohemia and in North Moravia. On the contrary, transformed cooperatives dominate in the traditional inland agricultural regions (Haná Lowland in Moravia, northern part of South Bohemia, and North-East Bohemia).
Map and commentary: Antonín Götz

The case b), however, included many problems. Plot boundaries had to be precisely delimited and the land fragmentation, accessibility, etc. must have been taken into account. It was often difficult to justly divide animals, stock, machines, etc. with respect to their further use.

Most of former cooperative members, however, entered the transformed cooperative farms.

There were 1,199 cooperatives with average size of 2,132 hectares before the transition process started. 1,679 new legal subjects (average acreage 1,357 ha) came into being when transformation was finished: owners' cooperatives, share companies, limited companies. By the end of 1994, the number of cooperatives has increased by 40 % since many were subdivided into smaller units and the average size dropped to almost one half from 2,500 hectares to 1,430 hectares (as to December 31, 1994).

Unlike most developed countries where private farming dominates, in the Czech Republic cooperative farms have so far retained its leading position.

Cooperatives themselves, however, will undergo significant changes. Their future role is viewed by different people from different perspectives: some beleive that cooperatives will retain their current dominant position forever, others presume that there is no place for such units in future Czech agriculture. Divila (1994) outlines various possible scenarios of cooperative future. He suggests restructuring and division of cooperatives into small, economi-

cally viable units. Adaptation to market conditions is inevitable. Such internal economic transition must be supported by the transition of legal, ownership, and business relations. In a sense, it would be a specific kind of internal privatization in the cooperative framework.

Such privatization would bring direct responsibilities and more features of real enterprising. It might be the first step towards sustainability of small businesses. Cooperatives would be fragmented into smaller farms; new trade activities would emerge. Some cooperatives would cease to exist, other would be transformed into specific establishments securing access to markets, technical background, etc. for private farmers.

4. State farms

State farms were established in 1949. They were given the land belonging to the organization named Czechoslovak State Forests and Farms. On January 1, 1949 state farms managed 146,476 hectares (1,9 %) of all agricultural land. This initial extent, however, increased fast since state farms were gradually granted properties subjected to the 1st and 2nd land reform, estate and church properties, uncultivated land in the frontier, properties of the former provincial national committees and mountainous pasture cooperatives, etc. Later, state farms acquired also some commandeered private properties and the land of economically weak cooperatives, mainly in hilly and mountainous parts of the country. State farms managed 25.4 % of Czech agricultural land in early 1990.

Denationalization and privatization of state farms under the conditions of economic transition is a troublesome task.

Most state farms are located in hilly and mountainous regions along the Czech border and also in basins. Having rather low economic efficiency on one hand, state farms on the other hand offer jobs that are often scarce in such regions and they are key elements in the settlement network and local infrastructure.

Based on the Act No. 92/1991 dealing with transfers of state property to other legal subjects, privatization of state farms is part of the big privatization concept. Following methods are used:

a) sale by public competitions;

b) sale to a designated owner (including preferential sales of property parts in the restitution framework);

c) establishing of commercial companies (especially share companies) in the framework of coupon privatization;

d) sale by auctions;

e) free property transfer, namely to municipalities.

Some state farms or their parts temporary remain state property.

The actual denationalization and privatization of state farms consists of the following steps:

1) properties subject to restitution laws are returned;

2) ownership rights concerning land and agricultural property are clarified on the base of the Land Act;

3) privatization project must be carried out and approved

4) state property is legally transferred to the National Property Fund or to the Land Fund;

Table 2 – Privatization of state farms and similar establishments managing land (by December 31, 1993)

Establishments involved	316
Submitted projects	1,414
Approved establishments	109
Approved projects	132
No. of projects to be realized through the Land Fund	58
Property value (mil. CZK)	47.819
– restituted property, compensations	21,169
– property legally attached to the land[1)], country roads	7,990
– property to be privatized	18,660
Property value (approved projects only)	8,018
Percentage of privatization[2)]	43

[1)] reclaimed land and permanent cultures (including constructions)
[2)] percentage of property approved for privatization
Source: Základní principy zemědělské politiky vlády ČR do roku 1995 a na další období (Basic Principles of the Czech Agricultural Policy By 1995 and in the Following Period), Údaje pozemkového fondu ČR – počet projektů k realizaci (Czech Land Fund Data – Projects To Be Realized).

5) part of the property is rented;
6) the whole property or its part is sold by auction or sold to a designated owner. The property is transferred into the form of a share company;
7) the property is transferred for free to municipalities or social funds.

Privatization of state farms has been laregely influenced by the scope of restitutions. Legal comminttments stemming from restitutions much slowed the privatization process.

Different timing of restitution and privatization processes in the period 1991 – 1994 proved to be the greatest problem. Some one half of state farms properties will come to private hands through restitutions and legal compensations.

Privatization of state farms must include privatization project based on specific rules. It is subject to approval. Such project should consist of precise definition of the respective property, way of acquirement, value, way of transfer of the privatized property including responses to claims of liable subjects. In case of a trade company the procejt must specify its legal form. If state property is sold, the project must include also the kind of sale, price, instalments, timing, and purpose.

Any privatization project must concern all legal kinds of property. These are as follows:
– property subject to restitution laws;
– legally unspecified property;
– church property (so far it can not be privatized);
– state property that can not be privatized because of indirect restitution claims;
– state property subject to privatization.

316 state farms have entered the privatization process.

Since the restitution process has not been finished yet, many problems emerged. It has been decided that state farms property can be rented before it would be finally privatized. State property subject to restitution that yet has not been transferred and property that

yet has not been passed to the holder of privatization project has been rented according to the following preferences:

1) persons or parties claiming restitution of the respective property
2) authors of the privatization project;
3) hitherto users;
4) private farmers;
5) local residents;
6) other persons or parties interested.

As soon as the restitution process is finished, it is generally expected that renters would become owners of the rented property (including land).

The method of payment is the key aspect of the decision-making process if the state farm property is sold. First, all financial commitments (regarded as part of the overall cost) related to the privatized property must be accepted by the new owner. The rest then can be paid in various ways. If the money are paid in full not later than 60 days after signing of the contract, only 43 % of the value signed is required. The payment can also be based on interest-free instalments over the period of up to 20 years; in such case one must pay the full value.

Privatization of state farms was much delayed at the beginning of 1994. The process, however, was later accellareted and 95 % of privatization plans have been approved by the end of 1994. The privatization itself is currently in action. Two thirds of state farms will be sold. Most new owners have the legal form of limited companies (33 %). Some 5,700 rather large units (average acreage over 100 hectares) would come into being.

5. Private Farmers

State farms are legally owned by individuals (not by companies). The number of private farms has been constantly increasing and it exceeded 60,000 in the end of 1994. The average size is 16 hectares. Only 1,100 private farms, however, own more than 100 hectares of land. These large private farms are already an important competitive factor on the market.

Many new landowners – former cooperative farmers or people that did not work on the land any more – use just a small part of the returned land for private farming. Many became part-time farmers. The rest of the returned land has often been rented to the former users or to private farmers who want to expand their acreage.

The share of private farming on agricultural production has not risen dramatically. Among the important reasons of this are the following facts:

1) The acreage acquired by private farmers is usually well below the economically viable minimum for farming under market conditions. To increase the size, most private farmers have to rent land from landowners that are not interested in farming.

2) The property of former cooperatives and state farms mostly consisted of large stables and machines for large scale production.

3) Cooperatives often lack finances to pay for the property of entitled subjects.

4) Macro-economic conditions in agriculture are generally poor (low sales, price structure, etc.).

5) Inevitable renewal of farm buildings is costly.

6) No information system and no consultang bodies exist.

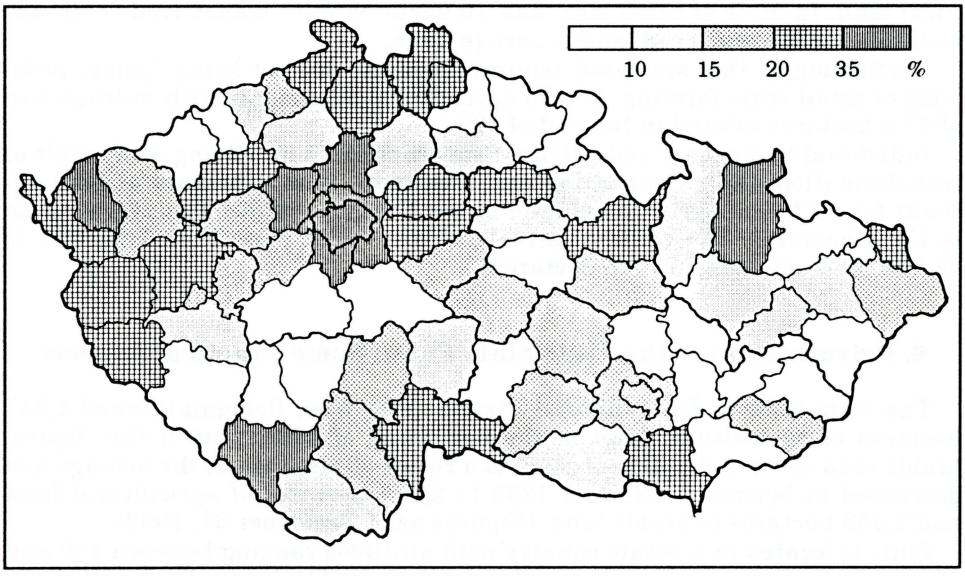

Fig. 5 – Private farmers: share of agricultural land owned by private farmers (January 1, 1994). The share of agricultural land owned by private farmers has been in 1995 estimated to amount to ca. 23 %. No surprise that many private farmers are found in the Prague's environs where land is fertile and demand for agricultural products high. West Bohemia and part of North Bohemia also show high share of private farmers. On the contrary, there is a relatively little interest in private farming in the Moravian agricultural regions (Haná Lowland).

Map and commentary: Antonín Götz

Table 3 – Czech agricultural business (December 31, 1994)

Type of business	Number	Acreage (agricultural land)		Average acreage
		ha (,000)	%	ha
Businesses transformed from cooperatives and state farms	2,767	3,143	73.4	1,135.9
Private farmers (total)	60,666	993	23.2	16.4
– p.f. with more than 1 ha	27,402	971[1)]	22.7[1)]	35.4[1)]
Private businesses total	63,433	4,136	96.6	65.2
Private businesses with more than 1 ha	30,169	4,114	96.1	136.4
Other (residual state farms, school farms, military land, etc.)	345	145	3.4	420.3
Total	63,778	4,28	100.0	67.1

[1)]Estimated figure

7) It is psychologically difficult for many potential private farmers to start the business.

8) Interpersonal relations in the country are not ideal.

Much of the former state and cooperative land has been transferred to new landowners before the end of 1994. This concerned 16 % of all Czech agricul-

tural land. In 90 % of cases less than 10 hectares were transferred. This fact well reflects the scattered land tenure in 1948.

Restitution of this scattered tenure, however, did not bring typical problems of small scale farming. 63,778 agricultural businesses with average size of 67.1 hectares existed in the end of 1994.

Individual businesses and private firms that came into being as a result of transformation and privatization and own more than 1 hectare of land account for 96.1 % of agricultural land in the Czech Republic. The average size is 136.4 hectares. The share of private farmers with more than 1 hectare is 22.7 % (average acreage 35.4 hectares).

6. Privatization of the Žihle State Farm: Some Practical Aspects

The state farm in Žihle (district Plzeň-North, West Bohemia) owned 4,937 hectares of agricultural land in the beginning of 1990. Out of this figure, arable land covered 4,169 hectares. As a result of restitution, the acreage has decreased in between 1991 and 1993 to 2,899 hectares of agricultural land and 2,453 hectares of arable land. (Figures as of December 31, 1993).

Žihle is located in a potato country with altitudes ranging between 400 and 620 m. It is a varied, largely wooded landscape. The annual precipitations are around 500 mm, average temperature 7.5 ^{O}C.

The first step towards the transformation has been the response to restitution claims. The following property transfers occurred:

1) Land – all plots used by the state farm until June 24, 1991 (the date when the respective Act became enforceable) must be returned if legally claimed.

2) Buildings – all buildings used by the state farm until June 24, 1991, must be returned if legally claimed with no respect to past transfers among agricultural and other organizations.

3) Farm stock, animals, and equipment – the organization which took the property or its legal successor is responsible for compensations (Article 20).

Altogether 270 restitution claims concerning land, 53 claims for buildings, and 168 claims regarding compensations for farm stock, animals, and equipment have been raised by March 31, 1993. The original restitution deadline has been several times postponed. 68.59 % of all claims were satisfied by December 31, 1993. The property transferred (excluding land) amounted to 71.6 million CZK.

Based on the governmental proclamation specifying the list of companies to be privatized, the Žihle State Farm has become part of the second privatization wave.

The basic privatization project of the Žihle State Farm (June 1992) combined all privatization methods. The property that should have been privatized amounted to 342,320,000 CZK. It was divided into following parts:

1) Restitution claims (including reserve)	110,532,000 CZK
2) Property remaining in state hands	9,891,000 CZK
3) Property unsuitable for enterprising	1,667,000 CZK
4) Privatization by direct sales	8,587,000 CZK
5) Privatization by auctions	124,000 CZK
6) Privatization based on public competition	497,000 CZK

10 other privatization projects concerning parts of the property have been compiled by the legal deadline.

The way how the Žihle State Farm should be privatized has been discussed at the Czech Ministry of Agriculture in summer 1992.

The property of Mladotice Department was transferred to the newly established owners' cooperative Mladotice on November 1, 1992. The cooperative manages the property of 74 entitled subjects from Mladotice, Chrašťovice, Černá Hať, and Strážiště. Restitution claims concerning land, farm stock, animals, and equipment amounted to 21,369,000 CZK and were satisfied on the base of the Land Act. Restitution claims concerning buildings and movable properties were compensated at the base of accounting values.

Renting of the state farm properties to individuals and companies was a hot issue at the beginning of 1993. After negotiations with the Czech Land Fund, parts of the Žihle State Farm property that were not included in the basic privatization project have been rented. This was the case of pastures at Tis u Blatna (including land), Nový Dvůr Farm (including land), and of building yard and concrete factory in Velká Černá Hať.

In the course of 1993, privatization of the Žihle State Farm was discussed at the Ministry of State Property and Its Privatization. Czech government session of September 22, 1993 discussed the same issue, too. The basic privatization project has been approved as was the partial privatization project concerning the production of fodders and forage in Žihle. Other privatization projects were not approved.

Property of the newly established share company (Žihle Estate, Ltd.) is valued at 188,000,000 CZK. 60 % of shares are coupon shares, 35 % to be sold in public competition, 3 % belong to the restitution fund, 1 % to the investment fund, and 1 % are employees shares.

The privatization project is managed by the Czech Land Fund. It has established the share company named Žihelský statek, a.s. (Žihle Farm) based in Žihle.

This share company took full responsibility for all debts, claims, and credits on December 31, 1993.

The company focuses on livestock production, mainly on pig breeding. Improvement and selection of the breed is of great importance. The piebald Přeštice breed, white thoroughbred, and landrace breed are most common. The company has its own insemination centre, fattening station, and slaughter section. Beef breeding and dairy farming are important, too.

Corn (grown on 55.1 % of land), pulses (1.3 %), oil-seed (5.1 %), and fodders and forage on arable land (38.5 %) are among the leading cultivated plants.

Table 4 – Ownership of agricultural land in the former Žihle State Farm (October 1995)

	number	acreage
1) Owners' cooperative Mladotice		865 ha
2) Private farmers – landowners	23	434 ha
less than 2 ha	8	5 ha
2 – 5 ha	1	4 ha
5 – 10 ha	6	50 ha
10 – 20 ha	2	21 ha
20 – 50 ha	4	104 ha
more than 50 ha	2	250 ha
3) Private farmers – renters		739 ha
4) Žihle State Farm		18 ha
5) Žihle Estate, Ltd.		2,881 ha

The company also performs other activities such as transport, repairs, building, drying, trade, groats processing, and housing.

The so called residual state company manages apartments, temporary rented property, and the property that is gradually transferred to entitled subjects in the restitution framework. There is no material production.

Table 4 shows how the agricultural land has been managed in the beginning of October, 1995. In early 1991, the former Žihle State Farm cultivated 4,937 hectares of agricultural land.

6. Conclusions

Successful economic transformation and privatization are conditioned by many aspects. Restitution of owners' rights, return or compensation for confiscated property, transformation of cooperatives and privatization of state farms are among the most important ones. Privatization itself should not be focused just on rapid ownership changes but it should rather introduce market conditions and encourage real enterprising. The legal system allows various privatization methods and forms that are applied according to specific conditions of the privatized company.

New owners have to prove that they are qualified for successful agricultural enterprising under market conditions. It is very important for each new firm to establish a sound organizational structure. The size of farm, cooperative, or trade company must also conform to local conditions. These are main preconditions for generating profit.

The initial sucess largely depends on the behaviour of new owners and on the character of business relations. There are, however, also other aspects that much depend on the state. The state creates the overall economic environment including basic legal regulations and control functions.

The relatively low profitability of agricultural businesses has much influenced transformation, privatization, and restructuring. This disparity – compared to other economic branches – significantly hampers viable agricultural enterprising. In general, agricultural funds bring less profit.

To remove the above mentioned disparity, a complex of provisions must be put into action. These should be guaranteed by the state as part of the state rural programme. The provisions should include:

– tax reliefs;
– provisions of the Market Regulation Fund;
– agricultural subsidies;
– activities of the Support and Guarantee Agricultural and Forest Fund. This fund secures loans and partly subsidizes interest payments to make loans accessible for farmers.

Supply of agricultural products in general exceeds demand and overproduction is an important problem, too. It might be partly solved by levying quotas on certain commodities, or by increased exports. The agricultural market is influenced by the activities of the State Fund for Market Regulation in Agriculture. The Fund has the following tasks:

a) It purchases agricultural surpluses, stores them and in case of need exports them. Purchasing prices must not fall below a certain level ("guaranteed prices").

b) When increased demand can not be supplied at the market, the Fund sells the stored products and organizes imports if necessary.

Though the land tenure is rather scattered now, Czech agriculture is by European standards dominated by large production units. If these relatively large cooperatives and farms are managed efficiently, it might bring advantageous results at both national and international levels since Czech farmers are soon supposed to face the enlargement of European Union.

Market conditions will inevitably bring further horizontal and vertical integrations. Closer links between the agricultural production itself and processing branches are expected.

Four basic types of Czech agricultural businesses are supposed to exist in future:

1) Small private farms focused on subsistent agriculture. These are important to keep psychological links with the land and to maintain the social structure in the countryside. The economic viability of these "family farms" will be much influenced by their location and by the further progress of economic transition.

2) Small and medium private farms with market-oriented production.

3) Owners' cooperatives established mostly on the base of transformed former cooperatives.

4) Trade companies (mostly share companies and limited companies).

References:

Aktualizovaný privatizační projekt Státního statku Žihle. Žihle 1993, 601 p.

DIVILA, E. (1994): Od družstev k farmám. Otázka času nebo koncepce? Ekonom, 1994, No. 18, pp. 21-22.

PTÁČEK, J. (1990): Převod statku na družstvo. Zemědělské noviny, XLVI, No. 221, 20.9.1990, p. 7.

PTÁČEK, J. (1990): Uplatnění družstevních forem ve státních statcích. In: Privatizace v zemědělství. Sborník přednášek. Klub ekonomů při Spojenectví zemědělství a venkova, pp. 33-42.

PTÁČEK, J. (1991): Odstátnění a privatizace státních statků. In: Agrární politika – privatizace – legislativa – ekonomika – řízení. Sborník referátů z odborného semináře. Písek, pp. 124-135.

PTÁČEK, J. (1991): Státní statky v přechodném období. Ekonomika zemědělství, XXX, No. 12, pp. 539-541.

PTÁČEK, J. (1994): Některé problémy transformace státních statků v podmínkách tržního mechanizmu. Vysoká škola zemědělská, Praha, 142 p.

Stanovisko MZe ČR k privatizaci státních statků. Zemědělské noviny, III, 9.3.1993.

Základní principy zemědělské politiky vlády ČR do roku 1995 a na další období. Agrospoj 1994, MZe ČR, Praha.

Zpráva o stavu českého zemědělství 1994. MZe ČR, Agrospoj, Praha, 344 p.

Zpráva o stavu českého zemědělství 1995. MZe ČR, Agrospoj, Praha, 265 p.

Shrnutí

TRANSFORMACE ČESKÉHO ZEMĚDĚLSTVÍ

Radikální ekonomická reforma po zásadních politických změnách z konce roku 1989 probíhá i v českém zemědělství. Z krátkodobého hlediska byla hlavním cílem nové zemědělské politiky rychlá transformace a změna celého agrárního sektoru, která má vést k:

1. zakládání nových soukromých podniků na základě vyřešení majetkových práv u půdy a jiného zemědělského majetku,
2. zlepšování výkonnosti konkurenceschopnosti a tržní orientace,
3. vytvoření stabilnějších tržních podmínek,

4. modernizaci zemědělských technologií,
5. dosažení lepší regionální distribuce výroby, která by odrážela jak přírodní, tak i tržní podmínky.

Dlouhodobými cíly jsou udžet základní směr tržní orientace, výkonnosti a mezinárodní konkurenceschopnosti. Mezi další priority náleží trvalá udržitelnost, minimalizace negativních dopadů na životní prostředí, ochrana přírody a zlepšování kvality výrobků.

Stěžejním reformním zásahem je narovnání majetkoprávních vztahů v zemědělství. Jedná se o tři procesy:

1. Restituce
2. Transformace
3. Privatizace.

Návrat k přirozeným majetkovým vztahům patří k jednomu z největších problémů České republiky. Přijatý princip restitucí zahrnoval úplné restituce veškerého majetku, nemovitého i movitého, vyvlastněného státem po únoru 1948. Veškeré restituční nároky byly a jsou uspokojovány ze státního majetku.

Vlastní proces transformace zemědělských družstev se sestával z vypořádání majetkových nároků a z vlastní transformace družstev na jiné právnické osoby.

Většina členů původních zemědělských družstev se rozhodla přijmout novou formu družstva. Na rozdíl od dominantního postavení rodinných farem v zemědělství vyspělých zemí budou hrát v zemědělské výrobě České republiky nadále dominující roli zemědělská družstva. Dojde však k dalšímu vývoji zemědělských družstev.

Vlastní proces odstátnění a privatizace státních statků probíhá v těchto krocích:

1. navrácení majetku, který podléhá restitučním zákonům,
2. ujasnění vlastnických vztahů k půdě a zemědělskému majetku,
3. zpracování privatizačního projektu a jeho schválení,
4. převod majetku státu na Fond národního majetku či na Pozemkový fond za účelem realizace schváleného projektu,
5. pronájem části majetku,
6. přímý prodej majetku nebo jeho části předem určené osobě, nebo na základě veřejné dražby či veřejné soutěže, převod majetku na právní formu akciové společnosti,
7. bezúplatný převod části majetku na obce, sociální fondy.

Postup privatizace státních statků byl a je determinován značným rozsahem restitucí. Závazky vůči oprávněným osobám se totiž staly brzdou celého procesu jejich privatizace.

V průběhu transformačních procesů českého zemědělství nedošlo k podstatnému zvýšení podílu rodinných farem. Autor ve svém příspěvku rozebírá hlavní příčiny.

Poslední část příspěvku je věnována praktickým aspektům privatizace Státního statku Žihle, okres Plzeň-sever (západní Čechy).

Závěrem je konstatováno, že přes roztříštěné vlastnictví si české zemědělství podrželo na evropsklé rozměry velkovýrobní strukturu hospodaření. Dlouhodobější důsledky této velikosti zemědělských podniků, budou-li zpravovány efektivně, mohou být významné nejen pro české zemědělství, ale i pro zemědělství rozšířené Evropské unie. Postupně bude docházet k horizontální či vertikální integraci, která vychází především z nutného propojení zemědělské prvovýroby a zpracovatelských podniků.

V perspektivě lze předpokládat, že v zemědělství budou existovat čtyři formy:

– malé doplňkové farmy,
– malé a střední rodinné farmy s tržní výrobou,
– družstva vlastníků vzniklá zpravidla na bázi transformovaných zemědělských družstev,
– obchodní společnosti, zejména typu akciových společností či společností s ručením omezeným.

Obr. 1 – Členění na zemědělské výrobní typy. Oblasti: A – kukuřičná, B – řepařská, C – bramborářská, D – podhorská. Česká republika byla před 50 lety rozčleněna mezi čtyři "zemědělské výrobní typy" podle charakteristických, přestože nikoliv nejrozšířenějších plodin. Je to rozdělení podle úrodnosti půdy na typy: A – kukuřičný. Jde o nejteplejší oblasti jižní Moravy, kde dozrává kukuřice na zrno; B – řepařský. Jsou to ostatní nížinné oblasti státu, kde se z okopanin pěstuje cukrovka jako průmyslová plodina pro výrobu cukru. Je to nejúrodnější oblast; C – bramborářský. Je to pahorkatinná oblast a s ohledem na geomorfologický charakter území státu je to oblast nejrozšířenější; D – podhorského zemědělství s významným pěstováním pícnin na orné půdě a s vysokým zastoupením luk a pastvin. V šedesátých letech bylo provedeno členění, na základě

pedologického průzkumu půdy, ale základní zjednodušené členění na čtyři typy je používáno dosud.

Obr. 2 – Transformace zemědělství: podíl zemědělské půdy, patřící soukromým rolníkům, transformovaným družstvům a privatizovaným státním statkům, z celkové rozlohy zemědělské půdy v % (1. ledna 1994). Mapa vyjadřuje rozdíl půdy, která byla již privatizována a v případě družstev transformována na společnosti, na celkové výměře zemědělské půdy. V průměru celého státu to v současnosti činí 96 %. Zbytek tvoří státní statek, tj. zbytkové statky, školní a vojenské statky. Vysoký podíl transformace je ve všech oblastech státu, snad s výjimkou severozápadních Čech, kdy transformaci brzdí devastovaná těžební krajina s nepřehlednými restitučními nároky. Také v okolí Prahy je transformováno méně než jinde s ohledem na vyřízené restituční nároky.

Obr. 3 – Průběh restitucí v zemědělství: majetkové vypořádání v % uplatněných nároků (finanční hodnocení; k 1. lednu 1994). Zemědělské restituce byly nejvíce problematickým zásahem do zemědělství po roce 1989. Vyřizování uplatněných nároků na majetkové vypořádání v posledních letech značně pokročilo a k 1. lednu 1995 bylo ukončeno 57,8 % restitučních případů. Na mapě je znázorněn stav o rok dříve. Celkem je patrno, že ve vnitrozemí pokračuje vyřizování restitucí uspokojivě, zatímco v pohraničních okresech (ale také v Praze a jiných velkoměstech) je navracení zemědělského majetku složitější s ohledem na obtížnost dokládání nároků.

Obr. 4 – Transformace družstev: podíl transformovaných družstev na rozloze zemědělské půdy v % (1. leden 1994). Dřívější "jednotná zemědělská družstva" typu sovětských kolchozů byla po roce 1990 z povinnosti transformována na různé typy akciového hospodaření. Rozhodovalo se mezi "družstvy vlastníků", vlastními akciovými společnostmi, obchodními společnostmi a jinými právními subjekty. Přitom družstva ze zákona musela vrátit půdu těm restituentům, kteří na půdě chtěli hospodařit sami. Na mapě je znázorněn podíl transformovaných, tj. privatizovaných, družstev na celkové rozloze zemědělské půdy. Nízký je podíl v oblastech, kde dříve dominovaly státní statky, tj. na severovýchodě Čech, a pak na severní Moravě. Naopak vysoký je podíl v tradičně zemědělských vnitrozemských oblastech, tj. v severomoravské nížině Haná, v severních okresech jižních Čech a v severovýchodních Čechách.

Obr. 5 – Soukromí rolníci: podíl půdy soukromých rolníků na celkové rozloze zemědělské půdy (k 1. lednu 1994). Podíl půdy soukromých rolníků na celkové rozloze zemědělské půdy činí asi 23 % (odhad půdy ve výběrovém šetření v roce 1995). Je logické, že je větší v okolí Prahy, protože tam mají zemědělci lepší možnost odbytu své produkce, ale také proto, že jde o nížinnou oblast. Na druhé straně je vysoký podíl i v západních Čechách a v části severních Čech, zatímco v moravské zemědělské oblasti (nížinná Haná) je poměrně malý zájem o soukromé hospodaření.

Autorem map a komentářů k nim je Antonín Götz.

(Author is with Žihle Farm, Žihle 106, 331 65 Žihle.)

Arrived to the editor's office on January 25, 1996
Recommended for publication by Ivan Bičík and Antonín Götz

GEOGRAFIE – SBORNÍK ČESKÉ GEOGRAFICKÉ SPOLEČNOSTI
ROK 1996 • ČÍSLO 2 • ROČNÍK 101

OLDŘICH MIKULÍK, ANTONÍN VAISHAR

RESIDENTIAL ENVIRONMENT AND TERRITORIALLY FUNCTIONAL STRUCTURE OF THE BRNO CITY IN THE PERIOD OF TRANSFORMATION

O. Mikulík, A. Vaishar: *Residential Environment and Territorially Functional Structure of the Brno City in the Period of Transformation.* – Geografie-Sborník ČGS, 101, 2, pp. 128 – 142 (1996). – The article evaluates the residential environment of Brno according to the individual town wards. A more detailed analysis is done for the centre of the town. Parametres of housing resources, environment hostile functional clashes, extent of green areas and state of social environment have been taken into consideration. The results show a bad residential environment in the industrialized town wards in flat relief and a good one in the town wards situated in articulated relief.
KEY WORDS: residential environment, functional structure, Brno

1. Residential environment and territorially functional structure

One of aspects of conceiving environment in a city is the conception of residential environment. This conception considers towns and settlement systems as environment for life, especially for human housing. **Residential environment** is defined as that part of human environment in which mainly the complex function of housing is materialized. **Housing** is a process of cyclically repeating and changing activities of inhabitants aimed at reproduction and development of their life. The function of housing includes not only a simple accommodation, but also activities connected with family life and housekeeping, family economics, newly with business (when run directly in the domicile), leisure, self-realization, etc. It is composed of natural, technical and social environment. The residential environment can be understood as **interior** (flat and house) and **exterior** (Horký, I., 1984).

Its differentiation on the urban territories has its laws given by the interaction of historical and present-day aspects of physical-geographical position, social-economic function and social differentiation. The evaluation consists in identification and quantification of positive and negative aspects of housing and quality of life in different types of residential districts. The research methods used are mainly the field research and mapping, using of statistical data and position analysis. Individual characteristics of flats or of their inhabitants are not objects of research.

The problem's structure is the following:
a) characteristics of flat resources
- evaluation of technical equipment of flats (category or different equipment),
- evaluation of using of flat resources,
- evaluation of household's equipment by objects of long-term consumption

b) characteristics of house resources
- houses according to their ownership (family houses, private, communal and co-operative flat houses),
- height level of houses
- material of supporting walls
- character of housing (streets, loose, blocks of flats)

c) characteristics of natural environment and its state
- relief inclination
- mesoclimatic conditions and their impact on health
- green areas, their extent, proximity and quality
- pollution of natural environment directly influencing the quality of residential environment

d) characteristics of residential district
- technical infrastructure for housing
- local social infrastructure

e) social characteristics
- structure of population
- stability of population
- presence of risk groups of population and security factor
- acceptability for establishing social contacts

f) characteristics of location
- with respect to work possibilities
- with respect to extra-local services
- with respect to recreation areas
- with respect to transport facilities

The above-mentioned 21 factors do not form an absolutely exhausting list. They are mainly factors which can be quantified or at least qualitatively defined and evaluated. The evaluation is done from the viewpoint of the residential function, that means from the viewpoint of the inhabitant of the given residential district. In the same time, there is an interference of general factors (typical for different types of residential districts) which become objects of generalization with the individual ones.

The most general possibility is to compare the residential environment of different towns or of their parts. Accessible statistical data or elaborated typologies can be frequently used. This approach can offer certain global characteristics which would rather illustrate the position of different residences in the system of settlement and in localizing the system of national economics, the degree of urbanization and the physical – geographical region. Nevertheless especially in the case of towns, it gives too averaged values which, because of an increasing social differentiation, do not illustrate the real state of residential environment. A certain possibility to approach the reality might be using this approach for generalization of a more detailed research work. The representation of different types of residential districts, the characteristics of which will be generalized, will help to evaluate the real structure of the residential environment quality even in the inter-urban comparison, without nevertheless taking into account individual factors.

Such generalization must be preceded by an analysis of residential environment within towns and settlement systems. According to present-day findings, following principal types of **residential districts** (which can be further divided into subtypes) can be classified:

- urban brick flat houses of the pre-industrial, industrial and between-wars period,
- flat houses of early socialist period built in streets,
- estates of prefabricated blocks of flats,
- working class and Romany lodgings,
- residential districts of villa-type of the pre-war period,
- after-war family houses built in streets, detached or semi-detached,
- suburbs at principal roads.

The empirical research can attribute certain typical characteristics to each of the above-mentioned types or sub-types. Different types (which can be permeable mutually and with other functions) form on the territory of towns a structure which can be in a certain way generalized. This structure in combination with individual characteristics of residential environment gives a definitive view on differentiation of residential environment quality in towns. This structure can be cartographically mapped and analysed from the point of view of residential and functional structure of towns and definition of reconstruction zones. The quality of residential environment is likely to be soon exprimed by flats and lots prices. In this sense, it is related also to the so-called housing problem.

The methods of our analysis of the residential environment quality consist in putting together the evaluation of statistical data on different residential districts on the basis of data on houses and flats resources from the census of inhabitants, houses and flats on March 2, 1991, and possibly also other statistical data and field mapping and analyses of different residential districts, streets and houses. Experience of analyses of the social environment level in different types of housing (Vaishar, A., 1988) have been used. Also the method of analysing territorial and functional structure and territorial clashes has been used for identification of residential districts problems. Statistical data, if disposable, are used for possible specification and quantification of problems. The method has been verified during a several-year basic research Vaishar (1989, 1990, 1995) and in application studies in number of Moravian towns. Evaluation of territorial and functional structure has been done from the viewpoint of penetration, or neighbourhood, of functional zones with a more pronounced negative impact on the residential environment (production and transport zones) and with stressed claims on the quality of environment (recreation zones, residential and near-centre facilities).

An attentive reader will certainly notice that all the criteria of residential environment evaluation, given in the theoretical part, are not discussed in this paper. Some of them are not relevant at the level of town wards part or urban districts, others are hidden in the complex of other evaluated items. When analysing the residential environment, the attention was aimed mainly at the following aspects: technical equipment and using of housing resources, type and age of housing resources (compare Očovský, Š., 1989), localization of residential district with regard to sources of pollution and to environment deterioration, aesthetic qualities of environment, quantity and quality of green areas, equipment, social environment (compare Hapl, L., Link, J., 1985).

The first stage of evaluation of the internal differentiation of the residential environment has been done according to different town wards. The further stage has been devoted to a detailed analysis of the town ward Brno – Centre according to different urban districts. Only urban districts with residential function have been taken into consideration. From pragmatic reasons, individual urban districts have been identified with residential districts, although in fact they can be composed of several districts or represent a mixture of different types of buildings. Following aspects have been evaluated: parametres of housing (technical equipment, density of population), functional clashes, state of social environment, possibility of compensation of stresses in green areas. Different aspects have been evaluated by a point scale within the interval 1 to 5. The verbal description of point values is the following:

Housing:
1 – the best technical equipment of housing resources, the highest habitable surface per person, the lowest number of persons per room
2 – a good technical equipment, a high habitable surface per person, a low number of persons per room or inconsistent characteristics among which positive aspects are nevertheless prevailing
3 – average characteristics of housing or inconsistent ones with a globally neutral aspect
4 – a bad technical equipment, a low habitable surface per person, a high number of persons per room or inconsistent characteristics with a prevailingly negative aspect
5 – the worst technical equipment, the lowest habitable surface per person, the highest number of persons per room

Functional clashes:
1 – neither in the urban district, nor in its neighbourhood, there are no activities disturbing residential function
2 – there is a less important functional clash with transports or medium clash with activities in neighbouring urban districts
3 – there is a more important clash with transports or industry or several less important functional clashes or an important clash with activities in neighbouring districts
4 – there are very important clashes, or possibly medium important clashes in a greater quantity and in the majority of the territory
5 – the urban district is a place of complex functional clashes, possibly even stressed by clashes in the neighbourhood

The state of social environment:
1 – a stable environment of districts with family houses with normal age structure of population and without disturbing effects
2 – a relatively stable environment of older mixed housing with minimum of disturbing effects
3 – social environment of near-centre territories with relatively stabilized population, but with a great number of newly arrived which diminishes the level of social control, social environment in neighbourhood of large parks with a reduced level of security
4 – social environment of districts of newer flat houses, mainly in open areas, characterized by a low level of social control and with a high instability of population
5 – social environment of deprived town quarters with a higher frequency of socially feeble and unstable strata of population

Compensation of stress factors through green areas:
1 – the urban district is rich in green areas, mainly in combination of family houses gardens, of gardens near social facilities, of trees in streets and of smaller parks
2 – the urban district has a sufficient quantity of green areas which are possibly completed by green areas in the neighbourhood
3 – in the structure of the urban district, green areas, possibly completed by green areas in the neighbourhood, are represented
4 – the urban district has less important green areas or there are more important green areas in the neighbourhood

5 – the urban district nearly lacks green areas and even in the neighbourhood, there are no larger or qualitatively satisfactory green areas

We are aware that the individual evaluated aspects are not complete and not equally important. We nevertheless suppose that any equal importance cannot be objectively settled, as its character is subjective. The most deficient lacking factor is generally considered as the most important one. For that reason, when interpreting the results it is necessary to take into consideration always not only the total sum of points, but also their structure. In urban wards, it is necessary to take into consideration that their residential environment can be largely differentiated and the average level must not express the state of each of its parts. As the same criteria have been used for of evaluation of town wards and urban districts of Brno – City, extreme values for town wards do not appear in certain criteria.

2. Brno town in the period of transformation

The evaluation of the residential environment level and of the territorially functional structure must be also based on the evaluation of functions of the town in the period of transformation. Brno is the second most important town in the Czech Republic and the most important centre of Moravia. It has 390,000 permanent inhabitants (1994), about 80,000 persons are regularly coming to study, to work, to use the services or other facilities in the town. The position of the town in the national system of settlement (for more details, see Vaishar, A., Mikulík, O., Zapletalová, J., 1995) corresponds to its advantageous localization, to its historical development, early connection to the railway net and to the localization of some supraregional functions.

Among the basic urban functions of Brno, we will mention mainly the following ones:

- commerce and tradefairs
- science, schools, culture, innovation
- industries
- transports and storage
- central servicing
- tourism
- administration

Realization of the above-mentioned functions must be reflected in the internal structure of the town and in its environment. Situation in three model problems sets has been analysed: transports, green areas and of retail trade distribution (Vaishar, A., Mikullík, O., Zapletalová, J., Barták, R., Dokoupil, M., 1995). A comparison with towns of similar size in Italy and Great Britain has shown that the present decisive feature of the decision making process in the sphere of the structure of the town and its environment in the conditions of the Czech Republic is namely the transformation, that means also to search optimal forms of town administration and their low stability.

According to Zahradníček (1993), there are two basic conceptions: one of them is based on the opinion that Brno has already reached its maximum and that a further development is not desirable, the other one is convinced that the prosperity potential of the town is not yet exhausted and that, on the contrary, new sources have appeared. According to our opinion, the problem

of the development essence is important. A further quantitative increase of population is really undesirable and, in addition, it is opposed to the present development trends of towns in the corresponding stage of urbanization. On the other side we are convinced that a qualitative development, understood as development of the prosperity of the town, is not only desirable, but that new sources can be found. This qualitative development must nevertheless take into consideration not only the town in its administrative limits, but the whole urban region which will be progressively penetrated by suburban activities.

The traced perspectives will certainly reflect into the progressive reconstruction of the internal structure of the town and of its individual wards. Mainly the following changes can be considered: Clearance of the large and heavily devastated industrial areas near the railway station will improve the environmental situation of that zone. On the contrary, a deterioration of environment can be expected as a consequence of a rapid increase of individual transports. This increase will be due to realization of all the above-mentioned functions. For that reason, the solution of transports problems is the major task of the town development. Following partial problems are concerned: interconnection of internal and external transports, transfer of the railway station, conception of the airport, parking facilities in all parts of the town, public transport organization, solution of transit roads, etc.

Equally the problem of residential environment is important in the sketched connections. The residential environment is probably the most important aspect of the environment from the human viewpoint. The culture of the residential environment should largely correspond to the cultural importance of the town. Another topical problem is the competition for human resources between towns and regions. At present, an absolute growth of population is not important, but it is necessary to gain elites of different branches of human activities. A good residential environment can be one of the most attractive offers of Brno for these persons.

The small and middle business has some other claims on the residential environment. It is important to harmonize the residential and the work functions of different districts. The transformation changes also other aspects of the residential environment, the differentiation of the residential environment is increasing. The question naturally is, in which extent, in which time and in which proportion Brno will be affected by suburbanization processes, that is by a transfer at first of commercial and work activities and consequently also of housing from the inner city and by the gentrification, that is revitalization of the residential environment in the inner city (Sýkora, L., 1993).

3. Evaluation of the Brno residential environment

On the basis of the above-mentioned methods, the evaluation of residential environment has been done in different town parts. The results are shown in Figure 1 and in Table 1.

The worst evaluated town wards have been Brno-Centre and Brno-South, where the functional clashes are the most intensive. Already this statement shows the necessity of a corrected correlation of obtained results. Although the central part of Brno and the industrial ward Brno-South have approximately the same characteristics of a not very good housing, of scarce green

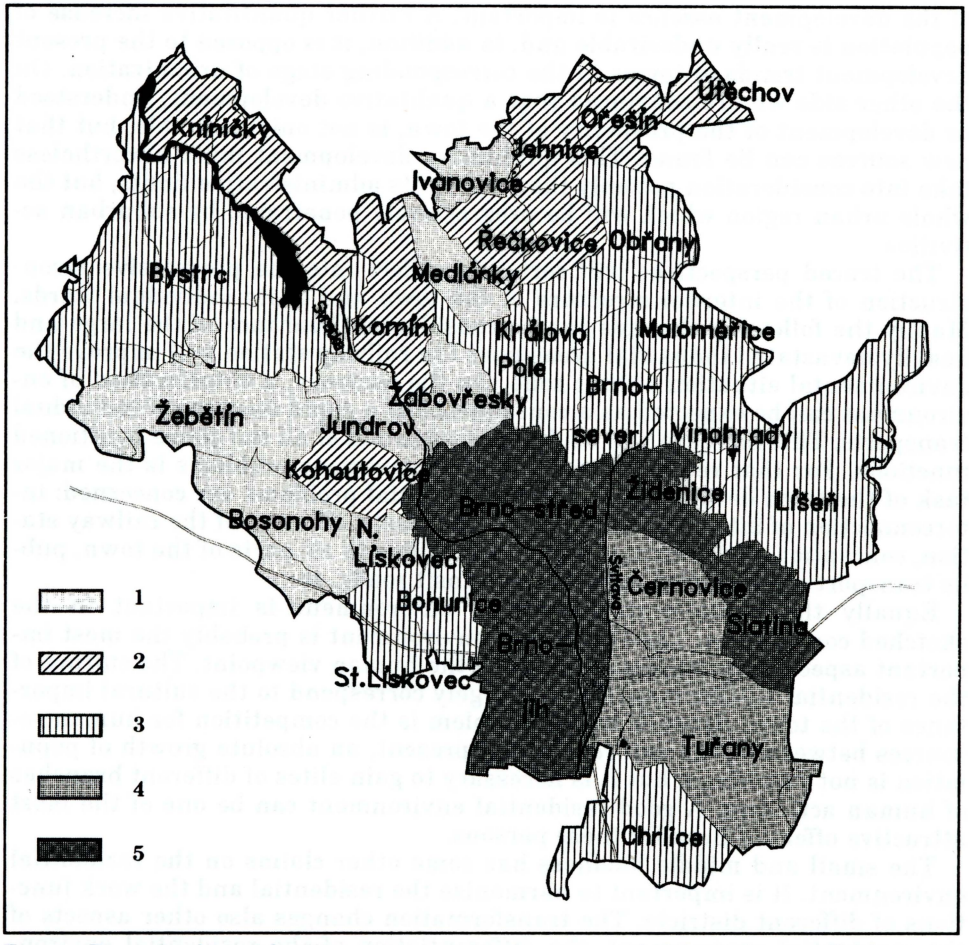

Fig. 1 – Brno: Quality of dwelling environment: 1 – very good (7-8 points – see Table 1), 2 – good (9-10), 3 – medial (11-12), 4 – poor (13-14), 5 – very poor (15-16)

areas, of migration of socially deprived population and of clashes of varied functions, including an intensive transport of all kinds and of industry (industrial works are even older in Brno-Centre), the attractiveness of both quarters is diametrically different. While Brno-Centre is highly attractive, Brno-South really represents one of the worst addresses in the town. The cause can be hardly quantified, but in the case of a town centre there is a *genius loci* which will make of the centre the principal point of the town even in the process of the expected suburbanization.

Another group of town wards with functional problems is located in the south-eastern sector. Average levels are given to unilaterally developed estates of blocks of flats and also to number of larger town wards with diversely developed functions. In the last case, the average evaluation is rather a result of making an average of quite different values than a homogenous quality.

Ancient country settlements at the town margins have been mostly evaluated as level 2. Their main functional problem is their distance from the cen-

Table 1 – Evaluation of residential environment in Brno town wards

	part	A	B	C	D	total		part	A	B	C	D	total
1	Bohunice	3	3	3	3	12	16	Líšeň	4	3	3	1	11
2	Bosonohy	3	2	2	1	8	17	Medlánky	3	2	2	1	8
3	Brno-sever	3	3	3	2	11	18	Nový Lískovec	3	2	2	1	8
4	Brno-střed	3	5	4	3	15	19	Obřany-Maloměřice	4	3	3	2	12
5	Bystrc	3	3	4	1	11	20	Ořešín	4	2	3	1	10
6	Černovice	4	3	3	4	14	21	Řečkovice	3	2	3	1	9
7	Chrlice	3	3	3	3	12	22	Slatina	4	4	3	4	15
8	Ivanovice	3	2	2	1	8	23	Starý Lískovec	3	3	3	3	12
9	Jehnice	4	2	3	1	10	24	Tuřany	4	3	3	3	13
10	Jundrov	3	1	2	1	7	25	Útěchov	4	2	2	1	9
11	Kníničky	3	2	3	1	9	26	Vihohrady	3	3	4	2	12
12	Kohoutovice	3	2	4	1	10	27	Žabovřesky	2	2	2	2	8
13	Brno-jih	4	5	3	4	16	28	Žebětín	3	2	2	1	8
14	Komín	3	2	3	2	10	29	Židenice	4	4	4	3	15
15	Královo Pole	3	3	3	3	12							

Key: A – housing level, B – functional clashes, C – state of social environment, D – green areas

tral activities. On the other hand, when compared to blocks of flats estates, it is a more natural way of settlement, where this deficiency is compensated by other functional advantages.

As far as green areas are concerned, the situation of Brno is not bad, mainly in the northern half. Certain problems are to be found in central and near-centre quarters, where green areas in the interior of blocs and in parks have been partly displaced by parking facilities and other equipment and in the southern part open to the agricultural landscape with prevailing arable land.

The total image of the residential environment differentiation in Brno in a relatively complex conception and according to individual town wards is the following: The best residential environment is in the town wards of the western half of the town, in many cases in spatially separated annexed settlements. Among the inner parts of Brno, the best residential environment is in Jundrov and Žabovřesky, on the other side in Řečkovice and Medlánky. They are town quarters mainly in an articulated relief directly linking with large forest areas in the neighbourhood of the town and with a high ratio of family houses in the housing structure. Similar characteristics are to be found in some new blocks of flats estates, as for instance in Kohoutovice and Komín, while the majority of the other ones reach only average values.

An average residential environment can be found in the majority of inner parts of Brno, a typical one being Královo Pole. Until 1919, this town quater had been an independent town. Since that time, it has maintained many elements of the structure of an independent town with all the types of housing and functional clashes. With the criteria used, it must necessarily represent a mean value.

4. Detail: Brno – Centre

On the territory of the town ward Brno – Centre, there are all functional zones of a town, that is the centre, the subcentral zone, the industrial zone including the energetic centre, the transport-storage zone, the residential

zone, the recreation zone and even agricultural areas. Differently from the majority of other town wards, it can be considered as a full-value town.

The relief of this town ward is diverse. Its central and north-western part is formed by articulated grounds of isolated hills, the most important of which being Špilberk, Žlutý kopec, Kraví hora and Červený kopec on the right Svratka River bank. The southern and partly also the western part in the meadows of the Svratka and the Svitava Rivers have a plain relief. The contact zone between the articulated relief of the northern part and the flat relief in the south probably were, together with the Svratka River ford, the initial localization factor of the town constitution. The Svitava river, forming the western border of the town ward, was the initial localization factor of the industry.

The centre of Brno is limited by the historic city, once situated inside the walls. A great part of the centre is pedestrian zone. The southern part is closed by the railway station. From the point of view of individual transports, parking becomes a serious problem.

The housing resources of the near-centre zone are partly very precious. They are mainly older flat houses in classical street form. A great part of residential buildings and complexes have a great urban and often also architectural value and have rather large and well organized flats. Their technical state, given by the age of the housing resources, represents often a problem. Valuable is the proximity of the centre, as well as sufficient green areas in parks and within the blocks of houses. The intensive transit transports are a disadvantage.

Eastwards and south-eastwards from the centre, the subcentral activities are in a bizarre way mixed with production areas. In these parts, the subcentral zone has become a refuge of the socially deprived population. This fact deteriorates the level of social environment and sensibly reduces the attractiveness of the near-centre zone.

The project "Southern Centre Brno" is being realized at the southern margin of the centre. There will be mainly super-urban tertiary and quaternary activities profiting of the very advantageous position as far as of the connection to the external transport systems, completed by housing and green areas. This part of Brno could play in future a decisive part in connection of Brno to the external world.

The industrial zone is situated at the eastern and southern margins of the town ward Brno-Centre. The older eastern part is limited by water courses, the younger southern one by the transport zone next to the railway station and today also by a highway junction. Sporadically, there are also isolated older industrial works, for instance in Staré Brno, on the territory of the town ward Brno-Centre.

Among the both industrial districts, the eastern one including the energetic centre of the town and the oldest factories of textile and machinery industries, is more problematic. The problems are due not only to exhalations, but also to the state of buildings and mainly to the mixture of industrial and other activities, housing included. In addition, this industrial zone is situated in the immediate proximity of the centre and limits the eastward development of the near-centre zone. The localization of the southern industrial zone, including research institutes and other modern infrastructure, is more advantageous. The zone crosses the borders of the town ward Brno-Centre and continues southwards.

One of the most serious functional clashes is the transport situation in the town ward Brno-Centre, where local transports intersect the urban and the

Fig. 2 – Panoramic view of Brno-central part (postcard)

inter-urban ones. The basic problem of the public transport system is its crossing and its connection to the external transport system. Electric transport traction does not pollute the environment, but it affects the environment by noise.

The problem of the Brno railway station has been discussed since a long time. Its location at the eastern margin of the centre was optimal in the past and even today it is very advantageous for the inhabitants and the visitors of Brno. Its transfer to the south is motivated by efforts to enlarge the centre in this direction and by capacity reasons. The Brno bus station at Zvonařka is probably one of the largest in Central Europe. Its accessibility from the northern parts of Brno, where building of new houses estates was recently concentrated, is however problematic. Parking is a great transport problem in the centre. Brno nearly lacks great capacity lay-by garages and parking places at the centre margin.

The inner transport circular road uses areas situated at the place of the ancient town walls demolished at the beginning of the 19th century. At present, this system is beginning to be congested in consequence of a rapid development of individual transports. As the external circular roads by-passing the inner town are not yet finished, this serious functional clash is even aggravated by transit transports.

An important residential zone with a high part of family houses has developed in the articulated relief of Žlutý kopec and Kraví hora. Initially, they were quarters of high middle classes of the Brno population. This housing is characterized by a stable social environment (given also by the ownership situation), by a higher individuality of residential environment, by a higher standard of technical and social equipment and of surface per habitant and by a relative abundance of green areas. The distance from the centre is not great, connection through trolleybus transports is optimal. The location of the district is prestigious.

Housing capacities mixed with infrastructure and other activities are characteristic for Štýřice southwards from the centre. Less marked residential districts are also in other parts of the town ward Brno-Centre. They are old flat houses from the period between two wars, from the fifties and from later

periods. The transport position of Štýřice is also advantageous. However, housing resources are partly obsolete. The quality of social environment is lower because of a higher migration and ageing of population. Green areas are less frequent. Some parts of this residential zone are affected by an intensive traffic.

The residential districts in the eastern margin of the town ward are composed of low standard flat houses, initially intended for workers. But there are also buildings intended initially for middle classes. At present however, practically all the housing resources are devastated, locally quite devastated and abandoned. The social environment is problematic. There are practically no green areas in that part of the town and if some, they are not maintained and their state is very bad.

Although the main recreation areas for Brno inhabitants are situated at the town margins, even Brno-Centre disposes of number of areas for a short-term recreation of its inhabitants and visitors. An important recreation zone is the castle hill Špilberk directly in the centre. The recreation function of Pisárky had to give ground at first to trading activities and today also to the circular road. Important recreation areas are also the Lužánky park, the Kraví hora zone with observatory, swimming pool and health area and number of smaller parks and public green areas.

A specific green area is the central cemetery at the southern margin of the town ward. At present however, town parks have become less safe, mainly at night hours.

A specific Brno zone is the exhibition grounds, built in 1928 in an attractive zone of the Pisárky valley. Some of its constructions are architectonic

Table 2 – Evaluation of the residential environment in the town ward Brno-Centre

	part	A	B	C	D	total		part	A	B	C	D	total
1	hrad Špilberk	3	1	3	1	8	34	nám. Míru	2	1	1	2	6
2	nám Svobody	3	2	3	3	11	35	Rezkova	1	1	2	2	6
3	Zelný trh	3	4	4	3	14	36	Gorkého	3	2	3	3	11
4	Janáčkovo divadlo	3	2	3	2	10	37	Konečného nám.	2	2	3	3	14
5	Pekařská	4	3	4	4	15	39	Mášova	4	2	4	4	14
7	Václavská	3	3	4	4	14	40	U stadionu	3	2	3	4	12
8	Nové sady	3	4	3	4	14	41	Dřevařská	3	2	3	3	11
9	Úvoz	3	3	3	3	12	68	tř. kpt. Jaroše	3	2	3	3	11
10	Žlutý kopec	2	2	3	2	9	70	Příční	4	4	5	5	18
11	Rybářská	2	3	4	3	12	71	Soudní	5	4	5	5	19
12	Kamenná	4	1	3	2	10	72	Hvězdová	5	4	5	4	18
13	Bakalovo nábř.	3	2	4	4	13	73	Tkalcovská	4	5	5	5	19
14	Stráň	2	3	4	3	12	74	Vranovská	4	3	5	4	16
15	Havlenova	3	2	4	2	11	92	Špitálka	4	5	5	5	19
16	Vsetínská	2	3	3	3	11	96	Skořepka	4	5	5	4	18
20	Vinařská	2	2	2	2	8	97	Stavební	5	5	5	5	20
22	Neumannova	2	1	2	2	7	98	Masná	4	4	5	4	17
23	Kamenomlýnská	1	1	1	2	5	100	Uhelná-Opuštěná	3	5	5	4	17
27	Červený kopec	1	1	1	1	4	102	Rosická	5	4	3	4	16
33	Vaňkovo nám.	2	1	2	2	7							

Key: A – housing level, B – functional clashes, C – state of social environment, D – green areas

dominants of Brno. Among the main problems of the exhibition grounds, let us mention the transport connection and an insufficient social infrastructure in the immediate neighbourhood. Parking places are insufficient for the present traffic density. Depart of visitors after the end of working hours regularly causes a transport collapse.

The inter-urban structure of Brno-Centre has developed historically. In its time, location of each activity had its logic. The last fifty years have affected the Brno-Centre structure less than the other town wards. The present problems of the inter-urban structure are logically those of the inner parts of historic cities in interaction with physical ageing of objects. The years of socialism were characterized rather by non solving of existing problems.

The main territorially functional clash of the urban ward Brno-Centre is the conflict between transports and the other functions and equally the conflict between different transports types and routes. Although this problem is apparent mainly in the urban ward Brno-Centre, it is the result of the transport system of the whole town. A serious conflict problem is that of the eastern industrial zone and mainly of terrains between the railway and the bus station. Another conflict represents the building and structure state of certain parts of the near-centre zone.

An evaluation of the residential environment has been done only for the districts with residential function. The non-residential districts have been taken in consideration when analysing the neighbourhood effect. Evaluation of individual districts is given in Figure 3 and Table 2.

On the territory of the town ward there are not only all the functional zones typical for a town of Brno size and function, but nearly the whole spectrum of problems of residential environment (with exception of spatially separated block of flats estates and former villages attached to Brno relatively recently). Extreme levels of the residential environment quality are at one hand in the districts of family houses in Stránice and Pisárky with a stable social environment, sufficient green areas and a low intensity of functional clashes, and on the other hand in the districts with damaged housing resources in Zábrdovice and Trnitá with a high occurrence of socially problematic groups of population, lacking green areas and serious clashes between their housing, productive and transport activities.

The average level of residential environment is to be found mainly in residential districts in the central and in a great part of subcentral zones, mainly in the northern and western corridor. The indices of housing level reach average values, green areas are sufficient, functional conflicts are due mainly to clashes with intensive transports and to a great quantity of different activities. Even here there are socially problematic groups of inhabitants either living there or bound to the railway station or other activities.

5. Conclusion

The paper has been initially intended as an information for the Brno town council. Its aim was not to evaluate the regional differentiation of the residential environment quality for the needs of the decision making process in view to improve it, but to include other problems, namely air pollution monitoring, into the global environment situation in the town from the viewpoint of the inhabitant. We do not suppose that its importance should consist in

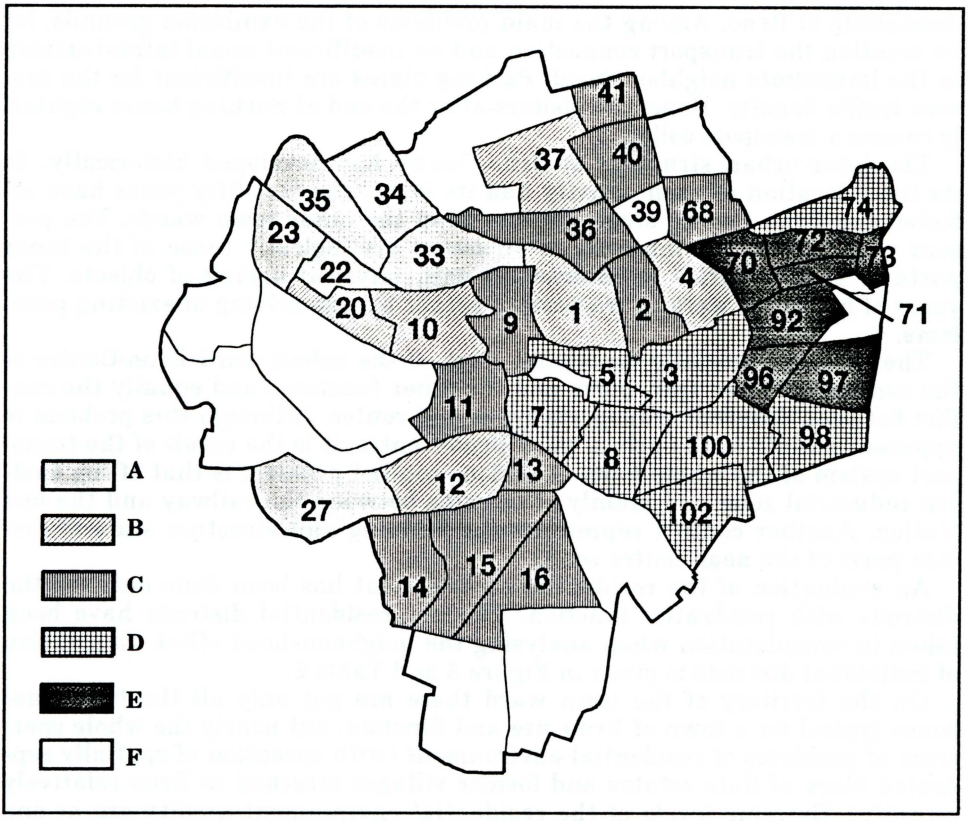

Fig. 3 – Brno-center: Quality of dwelling environment: A – very good (4-7 points – see Table 1), B – good (8-10), C – medial (11-13), D – poor (14-17), E – very poor (18-20), F – areas without dwelling function

concrete evaluation of the residential environment differences, which should be more or less known in the Brno decision-making sphere. On the contrary, intuitive findings about the differences of the residential environment quality in Brno have shown us that our method correspond to the reality as known empirically. It induces a certain probability of illustrating principal differences in the residential environment quality even in an other, not quite known town.

The aim of this paper has been to present the philosophy of one approach to the analysis of the residential environment in towns. We wanted to introduce the residential environment as a relatively complex category formed by natural, technical and social factors. It is also an attempt to present an alternative to the ecological evaluation of environment stressing mainly biological aspects.

In any case we did not want to calculate the quality of the residential environment on the basis of fixed algorhitms or to elaborate generally usable methods of its evaluation. On the contrary, we would like to stress traditional geographical methods as observation, field mapping, interviews, etc. The experience in perceiving the life of a town and of its individual parts can sometimes better reflect the reality than exact methods.

References:

HAPL, L., LINK, J. (1985): Ekologická úroveň vnějšího obytného prostředí projektů experimentálních obytných souborů a její hodnocení. Výstavba a architektura, 31, No. 6, pp. 3-15.
HORKÝ, I. (1984): Tvorba obytného prostředí. SNTL, Praha, p. 339.
OČOVSKÝ, Š. (1989): Domy, byty, bývanie. Veda, Bratislava. 238 p.
SÝKORA, L. (1993): Gentrifikace: měnící se tvář vnitřních měst. In: Sýkora, L. (ed.): Teoretické přístupy a vybrané problémy v současné geografii. Univerzita Karlova Praha, pp. 100-119.
VAISHAR, A. (1988): Geografický výzkum sociálního prostředí. In: Využití moderních metod pro geografický výzkum životního prostředí. Geografický ústav ČSAV Brno, pp. 107-113.
VAISHAR, A. (1989): Výzkum obytného prostředí jako parciálně syntetický přístup k životnímu prostředí urbanizovaných geosystémů. Zprávy GGÚ ČSAV, 26, No. 3, pp. 5-13.
VAISHAR, A. (1990): Diferenciace obytného prostředí malého města ČSR. In: Problémy venkovského osídlení, malých a středně velkých měst a jejich demografické struktury. VÚVA/ČSDS, pp. 212-215.
VAISHAR, A. (1995): Transformace společnosti a změny územně funkční struktury měst. In: Miscellanea geographica 4, Západočeská univerzita Plzeň, pp. 95-102.
VAISHAR, A., MIKULÍK, O., ZAPLETALOVÁ, J. (1995): The Town of Brno: Functions, Prospects, Environment. In: Vaishar, A. (ed.): Geography and Urban Environment. Regiograph Brno, pp. 102-112.
VAISHAR, A., MIKULÍK, O., ZAPLETALOVÁ, J., BARTÁK, R., DOKOUPIL, M. (1995): The Cultural and Economic Conditions of Decision-Making for the Sustainable City: Case Study Brno. Moravian Geographical Reports, 3, No. 1-2, Institute of Geonics Brno, pp. 4-29.
ZAHRADNÍČEK, L. (1993): Brno – město uprostřed Evropy. In: Mezinárodní konference Brno – město uprostřed Evropy. Magistrát města Brna, Brno, pp. 12-14.

Shrnutí

OBYTNÉ PROSTŘEDÍ A ÚZEMNĚ FUNKČNÍ STRUKTURA MĚSTA BRNA V OBDOBÍ TRANSFORMACE

Jedním z aspektů chápání životního prostředí ve městě je koncepce obytného prostředí. Obytné prostředí je definováno jako ta část životního prostředí člověka, v níž se realizuje převážně komplexní funkce bydlení. Bydlení je proces cyklicky se opakujících a proměňujících činností obyvatel, zaměřených na reprodukci a rozvoj jejich života. Obytné prostředí se dělí na vnitřní (byt a dům) a vnější. Skládá se z aspektů přírodních, technických a sociálních.

Hodnocení kvality obytného prostředí bylo provedeno ve městě Brně v období, které je charakteristické transformačními změnami. Území města Brna bylo hodnoceno podle městských částí, přičemž městská část Brno-střed byla analyzována podle urbanistických obvodů. V úvahu byly vzaty aspekty kvality a obložnosti bytového fondu, funkční střety nepříznivé z hlediska obytného prostředí (z nich nejčastější je narušení prostředí tranzitní dopravou), kvalita sociálního prostředí (tj. prostředí tvořeného samotnými obyvateli sledovaných obytných částí) a kompenzace nepříznivých environmentálních jevů prostřednictvím zelených ploch. Každý z uvedených aspektů byl hodnocen bodovou škálou v rozmezí 1 – 5.

Nejhůře byly hodnoceny městské části Brno-střed a Brno-jih, kde dochází k nejintenzivnějším střetům funkcí. V případě centra Brna je však nutno brát v úvahu vysokou atraktivitu plochy a historického prostředí. Další skupina městských částí s funkčními problémy se nachází v jihovýchodním sektoru. Průměrně jsou hodnocena jednak funkčně jednostranně rozvinutá sídliště, jednak řada větších městských částí s rozmanitými funkcemi. V posledním případě je ovšem průměrné hodnocení výsledkem zprůměrování rozdílných hodnot. Hlavním funkčním problémem bývalých venkovských sídel na okrajích Brna je jejich odlehlost od centrálních aktivit. Na druhé straně ve srovnání se sídlišti jde o přirozemější způsob osídlení.

Celkový obraz diferenciace obytného prostředí ve městě Brně v relativně komplexním pojetí a podle jednotlivých městských částí je následující: Nejkvalitnější obytné prostředí je

v městských částech západní poloviny města, a to v mnoha případech v prostorově oddělených připojených sídlech. Z vnitřních částí Brna je nejkvalitnější obytné prostředí v Jundrově a Žabovřeskách a na druhé straně v Řečkovicích a Mendlánkách. Jde o městské části zpravidla v členitějším reliéfu, bezprostředně navazující na rozsáhlé lesní plochy v okolí města a s vysokým podílem rodinných domů ve struktuře zástavby. Podobné charakteristiky mají i některá nová "sídliště", z nichž nejkvalitnější obytné prostředí je v Kohoutovicích a Komíně, zatímco většina ostatních spadá do průměru.

Na území městské části Brno-střed se vyskytují nejen všechny funkční zóny, typické pro města velikosti a funkce Brna, ale i téměř celé spektrum problémů obytného prostředí. Extrémními hodnotami kvality obytného prostředí jsou na jedné straně okrsky rodinných domů katastrálních území Stránice a Pisárky se stabilním sociálním prostředím, s dostatkem zeleně, nízkou intenzitou funkčních střetů a na straně druhé okrsky zchátralého domovního fondu v katastrálních územích Zábrdovice a Trnitá s nadprůměrným výskytem sociálně problémových skupin obyvatelstva, s nedostatkem veřejné zeleně a závažnými střety mezi bydlením, výrobními a dopravními aktivitami.

Průměrnou kvalitu obytného prostředí reprezentují zejména obytné okrsky centra a značné části subcentrální zóny zejména v severním a západním koridoru. Ukazatele úrovně bydlení zde dosahují průměrných hodnot, veřejné zeleně je dostatek, funkční konflikty vyplývají zejména ze střetů s intenzivní dopravou a z nahromadění různých aktivit. I zde se vyskytují sociálně problémové skupiny obyvatel.

Smyslem tohoto příspěvku bylo představit filozofii jednoho z přístupů k analýze životního prostředí ve městech. Šlo o to uvést obytné prostředí jako relativně komplexní kategorii tvořenou přírodními, technickými i sociálními faktory mimo jiné i jako pokus postavení alternativy k ekologickému hodnocení životního prostředí, kladoucího do centra pozornosti biologické aspekty. V žádném případě nám nešlo o "vypočtení" kvality obytného prostředí na základě stanovených algoritmů. Chceme naopak zdůraznit tradiční geografické metody jako pozorování, mapování v terénu, rozhovor a podobně. Zkušenost při vnímání života města a jeho jednotlivých částí může někdy odrážet podstatu reality lépe než exaktní metody.

Obr. 1 – Brno: kvalita obytného prostředí: 1 – velmi dobrá (7-8 bodů – viz tab. 1), 2 – dobrá (9-10), 3 – průměrná (11-12), 4 – špatná (13-14), 5 – velmi špatná (15-16)
Obr. 2 – Panorama městské části Brno-střed (pohlednice)
Obr. 3 – Brno-střed: kvalita obytného prostředí: 1 – velmi dobrá (4-7 bodů – viz tab. 1), 2 – dobrá (8-10), 3 – průměrná (11-13), 4 – špatná (14-17), 5 – velmi špatná (18-20), 6 – území bez obytné funkce

(Authors are with Institute for Geonics, Drobného 28, PO box 23, 613 00 Brno)

Arrived to the editor's office on February 6, 1996
Recommended for publication by Radim Perlín

GEOGRAFIE – SBORNÍK ČESKÉ GEOGRAFICKÉ SPOLEČNOSTI
ROK 1996 • ČÍSLO 2 • ROČNÍK 101

VÁCLAV POŠTOLKA

A NEW APPROACH TO THE ASSESSMENT AND DELIMITATION OF ENVIRONMENTALLY DAMAGED AREAS IN THE CZECH REPUBLIC

V. Poštolka: *A New Approach to the Assessment and Delimitation of Environmentally Damaged Areas in the Czech Republic.* – Geografie-Sborník ČGS, 101, 2, pp. 143 – 157 (1996). – The paper deals with the proposal of new criteria and methodology for geographical delimitation and differentiation of "environmentally damaged areas" in the Czech Republic. This new approach is based on "ecological, social and health load assessment" on the municipality area level by means of 27 proposed indicators. By means of this methodology more than 1200 selected municipalities out of the more than 6000 ones existing in the Czech Republic, all the municipalities from the North-West Bohemia area included, were assessed.
KEY WORDS : Ecological, social and health load indicators – environmentally damaged areas – environmental zones delimitation and differentiation – North-West Bohemia.

Preface

The so-called "damaged" or "affected" areas in the Czech Republic were defined and approved by the Czech government in 1974. The "damaged areas" (DA) have been defined as *"territories where the civilization factors impact has significantly unfavourable effects upon the natural environment, health of the population and its well-being , and all these negative effects have to be, at least partly, compensated for by special measures taken by the state administration and authorities"* (Kaulich, K., 1982, Usnesení vlády ČSR a ČR, 1973, 1974, 1980, 1990).

The latest amendments and changes regarding the delimitation and the range of these areas were taken by the Czech government in August 22, 1990 (Usnesení vlády ČR, 1990).

At present, according to this "last approved delimitation" of nine regions and eight cities, there are on the territory of the Czech Republic in total 17 damaged areas representing about 10 % of the total area with 39 % of the total population of the Czech Republic.

The used method of delimitation, together with to the wrong political practice before 1989, has been abandonned consequently to new requirements and demands in order to distinguish the extent, structure and intensity of environmental risks and problems within those damaged areas.

This was the reason why the new Czech government aspired after the political changes in 1989 to take new measures and regulations to improve the environmental situation preferably in the most damaged areas, including those aiming to compensate the impact of worsened living conditions in these areas.

Therefore, in November 1991, the Ministry of Economy and the Ministry of Environment were charged to ensure *"a delimitation of areas with environ-*

mental deterioration and to set regional policy priorities in these areas including measures for their support" (Usnesení vlády ČR, 1990).

In July 1993 the Ministry of Environment and the Ministry of Health presented to the Czech government *"a revised delimitation of ecologically damaged areas in the Czech Republic and a proposal of systematic measures in view to improve the environment in these areas".*

Therefore, the Ministry of Environment proceeded to draw up the *"Criteria and methodology for delimitation and internal differentiation of ecologically damaged areas in the Czech Republic"* and to test them in the area of North and North-West Bohemia (the Czech side of the so-called Black Triangle).

The Czech Ministry of Environment decided in April 1992 to entrust the Research Institute for Building and Architecture (Výzkumný ústav výstavby a architektury, VÚVA) and its Centre for Environmental Studies in Ústí nad Labem (in the North Bohemian brown coal basin) to prepare the first draft of the revised delimitation of the so-called affected areas in the North and North-West Bohemia (Poštolka, V. et al., 1992).

Criteria and Methodology of the Total Environmental Load Assessment

From the beginning, two basic principles have been stressed:

1) A comprehensive methodology should be created comprising not only the data on the physical or natural environment quality, but also indicators related to its social and health consequences, and particularly on their negative impacts upon the exposed population.

2) By means of this methodology, the extent, structure, intensity and impact of the so-called "ecological load" on the municipality administrative area should be evaluated.

The previous system of delimitation of the "affected areas" did not differ the extent, structure and intensity of the "ecological load" neither among "distinguished regions" nor within them. On the territory of the North Bohemia the "affected areas" included on the one hand whole districts with all there existing municipalities and on the other hand some of municipalities from some other districts. In both cases, however, comparable and compatible data refering to such decision were missing. Naturally, almost all the municipalities tried hard to be included into the delimited "affected areas" to get special state subsidies compensating the local ecological problems (Kaulich, K., 1982).

The proposed system of criteria and methodology for delimitation and internal differentiation of the "ecologically damaged areas" is based on the idea to define, to indicate and to measure by means of some basic selected indicators the extent, the structure and the intensity of the so called "total ecological load" or the "total environmental load".

Even though we have stressed in our methodology the main and prevailing part of the indicators and coefficients related to "negative impacts of physical and chemical factors on the environment" showing the intensity of negative effects due to the air, water, soil, landscape and biodiversity, noise and radiation loads, we prefer to emphasize the "total environmental load of the area". It includes also additional negative effects and consequences of social and health problems, risks and threats affecting inhabitants living in monitored territories (partly as a result of feedback).

It is just the combination of all the three different types of risk factors – the ecological (in a strict sense), the social and the health load (though the last one can be also a part of the social load) – showing more expressively the existing differences among municipalities. If evaluated separately, without respect to social and health risks and problems, they can often show a quite similar or a nearly similar intensity of the "ecological load".

Certain problems are connected with evaluation of health consequences and risks and with their territorial differences. For the time being all the accessible and available data make possible to assess and to differ among whole districts only, but do not allow the same within individual districts for the all municipalities areas.

The principle problem of this methodology is to define and to choose a set of reliable criteria and indicators, to determine as well as possible their mutual weight-proportions and to find an appropriate internal evaluation scale for each of these selected indicators. Therefore, we tested six different evaluation scale systems on two "model districts" – Liberec and Teplice in the North-West Bohemia – and the following conclusion has been drawn: none of the six different evaluation scales had fundamental effects on the change of municipality sequence according to different ways of the "ecological load" evaluation. The sequence of municipalities remained almost the same, meanwhile the total sum of "points" expressing the "ecological load" was changing.

Hence we suppose that this proposed methodology makes possible to compare the extent of ecological problems and to distinguish the municipalities in compliance with this measured extent.

Indicators for Ecological, Social and Health Load Assessment

We proposed to use a system containing 27 indicators of the total environmental load and consisting of three separated, but interlinking parts (groups).

Among the three proposed parts, we accept and validate the essential significance of the assessment and evaluation of the "physical environment" and of its deterioration (75 from the 100 points possible from the entire "total environmental load").

Within the remaining quantity of 25 points we want to acknowledge and to stress mutual linkages and relations between the quality of the "physical" and the "social environment", with a special respect to "health conditions, health risks and threats".

Table 1 – Multicriterial System of the Total Environmental Load Assessment – Proposal

Group of factors	Number of indicators	Number of points-max.	Span of points
Ecological load	14	75	2 – 15
Social load	7	10	1 – 2
Health load	6	15	1 – 4
Total environmental l.	27	100	1 – 15

N.B.: A more detailed information on the proposed structure and contents of the multicriterial system of this evaluation is given in Table 5.

Out of a set of the 27 chosen and used indicators of negative effects and impacts, we assign the main significance to the following indicators (including their proposed order; see Table 2).

For the remaining 13 used indicators – two last for "physical risks", four for "health load" and seven for "social load" – we use the range from 0 to 2 points.

Table 2 – Indicators Sequence According to their Significance for Assessment

Order	Indicator (type of load)		Max.points
1.	The share and extent of devastated landscape and land	E	15
2.-3.	Air pollution by flying dust (particular matters)	E	8
	Air pollution by sulphur dioxide	E	8
4.	Destruction of ecological biodiversity (instability or stability)	E	6
5.-8.	Flowing (river) water pollution	E	5
	The share of people supplied with unsuitable drinking water	E	5
	The share of damaged and dying forests	E	5
	The share of people affected by excessive noise	E	5
9.-12.	Air pollution by other harmful pollutants	E	4
	The extent of hazardous and toxic waste sites	E	4
	Life expectancy	H	4
	Appearance of malignant neoplasms	H	4
13.-14.	Soil contamination	E	3
	Others physical risks (as radioactivity, radon)	E	3

Since we want to assess only negative effects and to differ areas only according to the extent and intensity of these risks and threats, we propose to appoint the used points merely there, where the acceptable or reasonable limits of these negative effects will be exceeded.

If not, then we use mark 0, which means an area without excessive loads or threats.

For instance, as the lowest limit related to air pollution both by sulphur dioxide and by flying dust we decided to accept the limit of 44 μg per cubic metre as an average immission concentration per year.

Areas with a lower air pollution concentration have 0 points and are evaluated as "unloaded areas" (only from this point of view) without further or deeper differentiation. On the contrary an area with air pollution exceeding the given limit of 100 μg per cubic metre have 8 points (in maximum) and is qualified as a "critically overloaded area", also without any further and more detailed differentiation. The areas (in our case "administrative area of municipality") affected by air pollution in the range between 44 – 100 μg per cubic metre and year have 1 to 7 points (black points) according to a special evaluating table and can be characterized as a less or more "loaded territory".

Similarly it is possible to assess the extent and intensity of two or more selected problems by means of relevant indicators or of their associated groups.

We can also divide our proposed methodology into eight logical groups of topics, which generally cover all the essential problems of the "environmental deterioration and crises".

In compliance with this division it is possible to clarify the order of these issues and problems within our methodology (according to the highest possible number of relevant black-points).

Table 3 – Topics and Problems Related to the Total Environmental Load Assessment

Group of topics and problems	N.of indicators	Number of max.points	
1. Air pollution	4	22	(8,8,4,2)
2. Water pollution	2	10	(5,5)
3. Landscape and soil degradation	4	24	(15,4,3,2)
4. Biodiversity instability	2	11	(6,5)
5. Other physical impacts	2	8	(5,3)
ECOLOGICAL LOAD	14	75	(15....2)
6. Social structure	5	6	(2,1,1,1,1)
7. Migration of population	2	4	(2,2)
8. Health consequences	6	15	(4,4,2,2,2,1)
SOCIAL AND HEALTH LOAD	13	25	(4.....1)
TOTAL ENVIRONMENTAL LOAD	27	100	(15....1)

Table 4 – Sequence and Significance of the Assessed Topics and Problems

Order Group of topics and problems and number of possible black-points			
1. Landscape and soil degradation	24	5. Water pollution	10
2. Air pollution	22	6. Others physical impacts	8
3. Health consequences	15	7. Social structure	6
4. Biodiversity instability	11	8. Migration of population	4

Above all, we consider this comprehensive methodology as an "open system", in which it will be possible to make any further changes in favour to improve its practical implementation. We also know that our is only one of many possibilities and ways how to to identify, assess and measure the extent, structure, intensity and essential consequences of environmental problems.

Within the group of these "ecological indicators" we can distinguish two different types. On the one hand there are the so-called "basic" (meaning above all "with the possibility to be distributed almost everywhere" or "with a large scale distribution and impact"), on the second hand there are still the so-called "specific" indicators (with appearance or impact only within some areas or places).

While the basic indicators can be mostly acquired or derived from "large scale information and data sources" (e.g. from thematic yearbooks, maps and databasis concerning the whole area of the Czech Republic), the specific indicators are to be gained from "local or regional information sources" (in our case, mainly from the District Council authorities).

Among the 14 selected "ecological indicators" we differ ten basic and four specific ones.

A. Basic ecological indicators
1. Flying dust
2. Sulphur dioxide
3. Flowing water contamination
4. Population supplied by an unappropriate drinking water
5. Landscape and landsurface devastation
6. Soil contamination

7. Wind and water erosion
8. Biodiversity destruction (instability)
9. Damaged and dying forest
10. Noise pollution
(In total 10 indicators with 62 black-points in maximum).

B. Specific ecological indicators
11. Other harmful air pollutants
12. Offensive odour in the air
13. Hazardous and toxic waste sites
14. Other physical risky factors (e.g. radioactivity, soil radon, etc.)
(In total 4 indicators with 13 black-points in maximum).

N.B. A more detailed information on all the selected "ecological indicators" – including information on their availability (sources), reliability (quality) and ways of their elaboration and interpretation – is comprised in some VUVA's research papers (see Apendix).

Beside the "ecological indicators", the "total environmental load criteria and methodology" include the proposed indicators of "social and health environmental consequences" (see also Table 1).

Table 5 – The suggested Criteria Enabling the Total Environmental Load Assessment Containing Indicators of the Ecological, Social and Health Load Assessment

NUMBER	POINTS	INDICATOR - measure unit
1	max. 8	Flying dust, mikrogram per cubic metre per year for period...
2	8	Sulphur dioxide, mikrogram per cubic metre per year for period...
3	4	Other harmful pollutants in the air, acc. to expert estimation
4	2	Offensive odour in the air, acc. to expert estimation
5	5	Flowing water contamination, acc. to water quality indicators
6	5	Drinking water, % inhab.supplied by the unappropriate drinking water
7	15	Surface and landscape devastation, % of the total area
8	3	Soil contamination, acc. to expert estimation
9	2	Erosion by wind and water, acc. to expert estimation
10	4	Hazardous waste sites, acc. to expert estimation
11	6	Biodiversity instability, calculated acc. to land-use structure
12	5	Damaged and dying forest, % of the total forest area
13	5	Noise pollution, % inhab.affected by the excessive noise
14	3	Others physical risks (radioactivity, geopath.zones...), acc. to expert est.
15	1	Uncomplete families, % of all families
16	1	One-person households, % of all households
17	1	University educated people, % of all population
18	2	Native people (living in their birthplaces), % of all population
19	1	Unemployment, % of people in activ age
20	2	Migration balance, per 1000 inh. per year for period ...
21	2	Migration volume, per 1000 inh. per year for period ...
22	4	Life expectancy, separately for males and females
23	4	Appearance (morbidity) of malignant neoplasms
24	2	Mortality caused by malignant neoplasms
25	2	Mortality from diseases of the respiratory system
26	2	Mortality from diseases of vascular and circulatory system
27	1	Infant mortality

1 to 14	max. 75	Ecological load - air, water, landscape, biodiversity and physical factors
15 to 21	max. 10	Social load - social structure, unemployment and migration
22 to 27	max. 15	Health load - life expectancy, morbidity and mortality
1 to 27	max.100	TOTAL ENVIRONMENTAL LOAD - ecological, social and health risks

N.B.: The starting pointof each of the indicators is equal to 0, which means an area without any excessive negative impact and inclusive risk. Each of the indicators has its own "pointing scale" from this starting point 0 to the maximal possible number of points (black points).

This proposed evaluation scale is a result of discussions, various tests and final debates within a group of experts and authorities from the whole Czech Republic going on in 1993. Later, a modified and simplified new version of this criterial system (without evaluation of social and health problems and risks) was completed by the North Project Foundation in Ústí nad Labem.

For more details, see also Fig. 1.

The evaluation of the so-called "health load" is done by separated indicators for men and women, with exception of the mortality rate of sucklings. We have put more emphasis on the "average life expectancy" indicator and on the sickness rate (morbitality rate) caused by cancer. We have evaluated these two indicators by a double number of points in comparison with the other health indicators, that is 4 (2 for men + 2 for women) possible points.

The evaluation of the so-called "social load" was done by 1 to 2 points only. We suggest to use as perhaps the most important indicators of "deteriorated social environment" the low share of inhabitants living at present in their

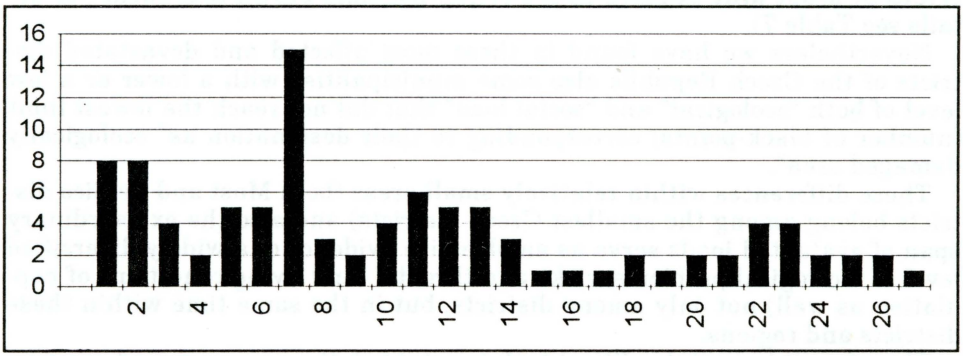

Fig. 1. – Indicators of the total environmental load assessment and maximal possible number of points at the proposed and used pointing scale. Axis x – indicators number, axis y – number of points. The list and structure of indicators: 1 – 4: Air pollution (1 = Flying dust, 2 = Sulphur dioxide, 3 = Other harmful pollutants, 4 = Offensive odour); 5 – 6 Water pollution (5 = Flowing water, 6 = Drinking water); 7 – 10 Landscape and surface (7 = Devastations, 8 = Soil contamination, 9 = Erosion, 10 = Waste sites); 11 – 12 Biodiversity (11 = Land use, 12 = Forest); 13 – 14 Physical factors (13 = Noise pollution, 14 = Radioactivity); 15 – 19 Social structure (15 = Uncomplete families, 16 = One-person households, 17 = Educated p., 18 = Native people, 19 = Unemployment); 20 – 21 Migration (20 = Migration balance, 21 = Migration volume); 22 – 27 Health problems and risks (22 = Life expectancy, 23 = Morbidity caused by cancer, 24 = Mortality due to cancer diseases, 25 = Mortality due to by respiratory diseases, 26 = Mortality by circulatory diseases, 27 = Infant mortality).

birth places, the migration balance and the migration volume rate. This type of indicators is particularly significant for the borderland of the North-West Bohemia.

According to the official migration volume data there is a theoretical exchange of population within some municipalities in a relatively short time period. Such instability of population and settlement has also its negative effect upon the "environmental situation" of these areas.

The Main Results of Environmental Load Assessment

For evaluation and classification of the so-called "total ecological load", a system with a scale of 100 points in maximum (100 %), **75 points (75 %) and 14 indicators are used for "ecological load", 15 points (15 %) and 6 indicators for "health load", 10 points (10 %) and 7 indicators for "social load".** (For further details see Table 5).

According to this evaluation system, the maximal possible level of separately assessed loads was reached only once, in one type of load and in one municipality only. Ten black-points were achieved for "social load" in municipality of **Rovná** (District of Sokolov) in the West Bohemia.

The highest number of black-points for "health load" (only whole districts, but for the whole area of the Czech Republic, were evaluated) was somewhat surprisingly found for district of **Cheb** (14 points) in the West Bohemia as well.

The highest levels of the "ecological (physical) load", but of the total sum of "ecological and social loads" and the highest level of "total environmental load" including "health load" were found in the area of two neighbouring **districts of Most and Teplice** in the North Bohemia brown coal basin (for details see Table 7).

Nevertheless we have found in these most affected and devastated districts of the Czech Republic also some municipalities with a lower or a low level of both "ecological" and "social load" that did not reach the lowest limit (number of black-points) corresponding to their designation as" ecologically damaged area".

These differences within relatively small areas (both Most and Teplice districts belong among the smallest Czech districts) and also the extraordinary span of evaluated loads serve as an objective evidence of a widely diversified level of "ecological problems, risks and threats" (and living conditions of population as well) not only among districts, but in the same time within these districts and regions.

Therefore it is a vital political task to establish the necessary and convincing **limits** both for classification and structuring of "ecologically damaged areas" according to municipality areas into **different levels (zones or degrees)** according to the degree of ecological, health and social loads affecting their territories, landscape, nature and human population.

We have proposed **20 points** for "ecological (physical) load" – it means 25 % of the possible maximal load or 40 % of the really identified maximal load (51 black-points were achieved in Komořany, part of Most) – as **the lowest limit** to classify any area as an **"ecologically damaged area" (further on, the abbreviation EcoDA is used).**

According to the "ecological load" level, we propose to divide EcoDA into three basic groups:

1. degree (20 – 29 points): areas with a "high ecological load"
2. degree (30 – 39 points): areas with a "very high ecological load"
3. degree (40 and more points): areas with a "critical ecological load".

This system of evaluation has allowed to classify and categorize more accurately the level of ecological problems, risks and threats and also to express the differences among municipalities (respectively their parts), districts and regions.

We consider this system of EcoDA delimitation and classification – if needed completed by the "health and social load" – as a vital basis and a turning point of the regional state policy in favour of areas and inhabitants affected by a deteriorated environment and in compliance with the extent, structure and intensity of this deterioration.

Out of the 6098 municipalities existing in 1992 in the Czech Republic, **selected 1242 ones** have been evaluated, which means about 20 % of all the municipalities, but also more than 25 % of the total area with more than 57 % of the whole population of the Czech Republic (in 1991).

We can say that this number includes nearly all the known existing and potentially assumed areas (municipalities) affected by environmental problems and risks. Therefore, we suppose that our results could be considered as an objective picture of ecological and environmental problems in the Czech Republic and on the Czech side of the so-called Black Triangle area (or European Black Boomerang).

Out of the 1242 evaluated municipalities (according to the proposed methodology) there were **525 municipalities** with 20 and more black-points of "ecological load" which could be included into EcoDA. **This means almost 9 % of all the municipalities and about 12 % of the total area with more than 49 % of the whole population of the Czech Republic are included into affected, threatened and damaged zones.** (See attached

Table 6 – Number and Share of the Municipalities in the Czech Republic (in 1992) and their Distribution into Three Zones of the "Ecologically Damaged Areas"

The area	CR totally	NW Bohemia	Rest of CR
Total	6098	657	5441
Evaluated	1242	657	585
%	20.4	100	10.8
EcoDA total	525	336	189
%	42.3	51.1	32.3
1. degree	392	236	156
%	74.7	70.2	82.5
2. degree	108	85	23
%	20.6	25.3	12.2
3. degree	25	15	10
%	4.7	4.5	5.3

N.B.: The NW Bohemia includes the whole area of 13 districts along the borders with Saxony and Poland and on the Czech side the prevailing part of the crossborder area of the Black Triangle with an enormous concentration of environmental problems.

From the remaining 63 districts in the rest of the Czech Republic municipalities from other 38 districts were selected, but in only in seven of them all the municipalities were evaluated.

maps of geographical distribution of ecological, social and health load in the Czech Republic).

The Problems of the North-West Bohemia on the Municipality Level

All the municipalities of the whole territory of the North-West Bohemia, in general assessed as the most affected and damaged part of the Czech Republic, have been evaluated.

This area includes 13 districts along the border with Saxony (in the former DDR and now one of the so-called new lands of Germany) and Poland (in the area of the so-called Lower Silesia) from Cheb (on the West) to Jablonec nad Nisou (on the East). This area constitutes the main part of the Czech side of the so-called Black Triangle, which is one of the most polluted and the most environmentally affected areas in Europe.

In accordance with our evaluation more than **51 % of municipalities within this area, which means about 51 % of the whole territory and 83 % of all population, can be classified as "ecologically damaged areas".**

An evidence of the significant differences in the level of ecological problems is e.g. a huge span of the "ecological load" between *Most* (51 black-points) with the absolutely highest load and *Brandov* (only 14 points) in the same district of Most (one of the smallest districts in the Czech Republic), and *Cetenov* (the district of Liberec) with the lowest level in this territory (only 5 black-points). The span between the municipalities of Most and Cetenov represents a ten times higher or lower "ecological load", burdening both nature and people of these areas.

More than 1,2 million inhabitants live on the territory of EcoDA in the North-West Bohemia, **which means about 83 % of the all there living inhabitants (from the total number of 1,48 million in 1991).**

Almost **60 % of the total area qualified as EcoDA in the Czech Republic** belongs to the territory of the North-West Bohemia with more than 31 % of the whole population living in the Czech Republic in the areas with a "very high and critical ecological load".

The situation of the North-West Bohemia will get considerably worse, if we take into consideration the "health and social consequences" (in comparison for instance with Prague and Ostrava regions, where the "ecological load" seems to be roughly the same).

There are 214 municipalities in the Czech Republic with **a moderate and high social load, 197 (92 %) of them being located in the North-West Bohemia** (see Table 7 and attached map).

In addition, **10 out of 13 districts in the NW Bohemia have been classified with a high and a very high "health load"** (see also Table 7 and attached map).

All this gives an evidence of an extraordinary concentration not only of ecological problems, but also of serious social and health problems cumulated in this area.

The attached table gives the basic data on the distribution of municipalities in the districts of the North-West Bohemia in compliance with their "ecological, social and health load" assessment.

We suggest to divide these "loads" into four levels according to the achieved number of the so-called black points (from the total sum of 100 black points):

Ecological load (EL) with the maximal possible number of 75 black points. 1. low – less than 20, 2. high – 20-29, 3. very high 30-39, 4.critical 40 and more.

Social load (SL) with the maximal possible number of 10 black points. 1. very low 0-2, 2. low 3-4, 3. moderate 5-6, 4. high 7 and more.

Health load (HL) with the maximal possible number of 15 black points. 1. very low 0-3, 2. moderate (low) 4-7, 3. high 8-11, 4. critical 12 and more.

(N.B. it was possible to assess only whole districts.)

Municipalities in the area of the North-West Bohemia (in 1992) according to the districts and the ecological, social and health load in compliance with the proposal of criteria and methodology for monitoring and evaluation of environmental problems, risks and threats (for a more detailed information, see VÚVA's research papers).

Table 7 – Number of Municipalities in the Area of the North-West Bohemia (in 1992) According to the Zones of Ecological, Social and Health Load

District	CH	SO	KV	CV	MO	TP	UL	LN	LT	DC	CL	LB	JN	Sum
Type of load														
Totally	39	39	53	49	33	41	27	65	105	52	59	60	35	657
low	31	14	33	19	6	6	0	40	29	23	45	46	29	321
high	7	13	18	20	11	15	18	23	56	23	14	13	5	236
very high	1	10	2	8	11	14	9	2	20	6	0	1	1	85
critical EL	0	2	0	2	5	6	0	0	0	0	0	0	0	15
very low	8	3	9	5	5	19	12	28	49	19	22	41	27	247
low	18	12	20	15	3	9	12	21	42	16	24	13	8	213
moderate	7	12	19	11	14	11	3	8	11	13	10	5	0	124
high SL	6	12	5	18	11	2	0	8	3	4	3	1	0	73
very low														0
moderate									105			60	35	200
high			53			41	27	65		52	59			297
critical HL	39	39		49	33									160

Districts on the territory of the North-West Bohemia (and their abbreviations) : Cheb – CH, Sokolov – SO, Karlovy Vary – KV, Chomutov – CV, Most – MO, Teplice – TP, Ústí nad Labem – UL, Louny – LN, Litoměřice – LT, Děčín – DC, Česká Lípa – CL, Liberec – LB, Jablonec nad Nisou – JN.

A further information is given in the attached maps (Fig. 2 – 5).

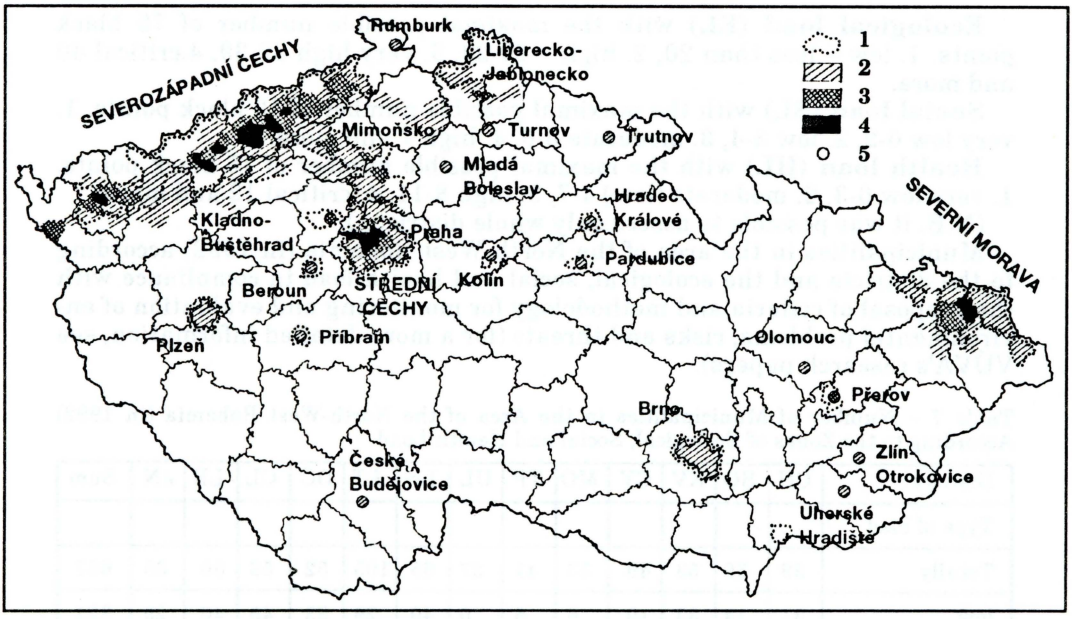

Fig. 2 – The Czech Republic: Ecologically Damaged Areas. Comparison with the "affected regions" according to the Czech Goverment's Regulation. 1 – Affected areas according to the Regulation of Czech Government from August 22, 1990. Ecological load (EL): 2 – high, 3 – very high, 4 – critical. 5 – towns with ecological load.
N.B. Municipalities and district areas on the attached maps correspond to the state in 1992.

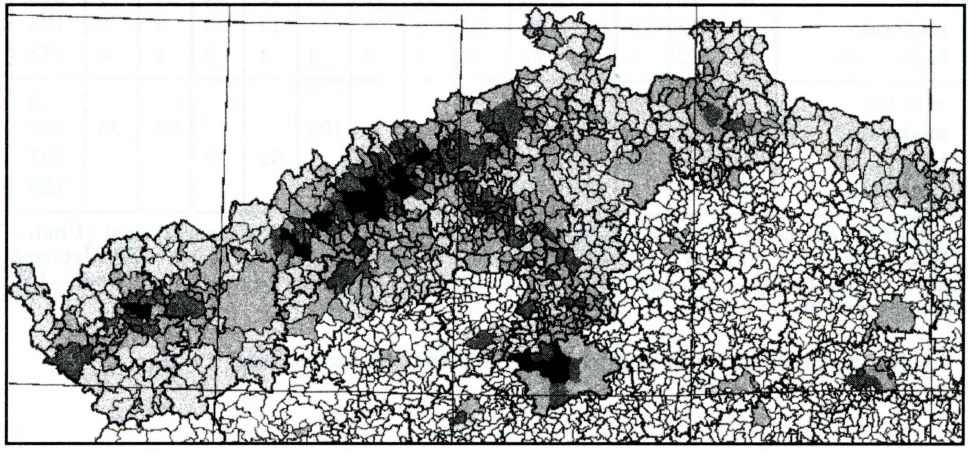

Fig. 3 – Ecological Load in the North-West Bohemia. Selected 1242 out of the total of 6098 municipalities were assessed. Degree of ecological load: white – not assessed, light grey – low, grey – high, dark grey – very high, black – critical.

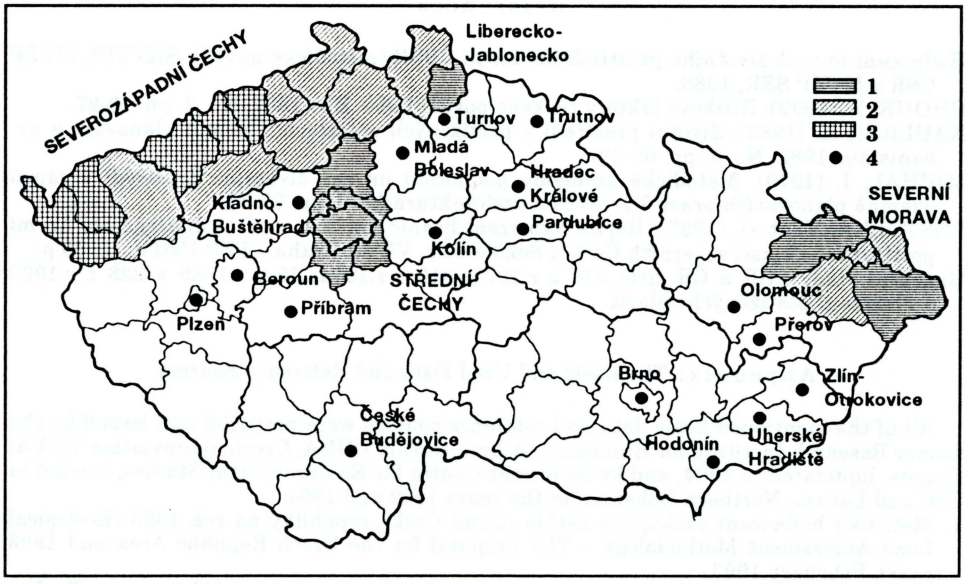

Fig. 4 – The Czech Republic: Health Load. On the district level (for all the 76 districts). Health load (HL): 1 – medium, 2 – high, 3 – very high. 4 – towns with ecological load.

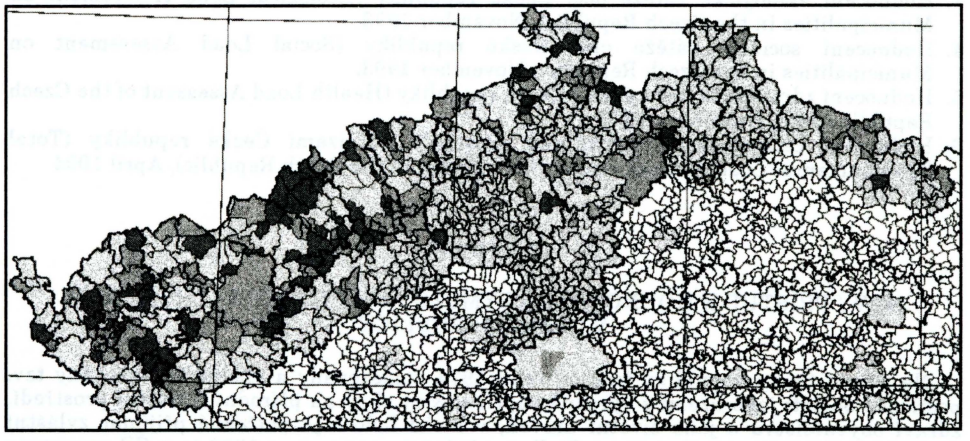

Fig. 5 – Social Load in the North-West Bohemia. Selected 1242 out of the total of 6098 municipalities were assessed. Degree of social load: white – not assessed, light grey0 – low, grey – medium, dark grey – high.

References:

Hodnocení úrovně životního prostředí na území ČSSR (metodický návod). SKVTIR, MVŽP ČSR a MVŽP SSR, 1988.
CHOUR, V. (1992): Rizikové faktory českého povodí Labe. Eko 1992, No. 3, pp. 18-27.
KAULICH, K. (1982): Životní prostředí v postižených oblastech. Územní plánování a urbanismus 1982, No. 9, pp. 60-62.
MÍCHAL, I. (1979): Metodické problémy hodnocení úrovně životního prostředí v rámci územně plánovacích prací. Výstavba a architektura 1979, pp. 22-33.
POŠTOLKA, V. et al. (1992): Revize vymezení hranic a návrh vnitřní diferenciace území postižených oblastí severních Čech a Sokolovska. VÚVA Praha – PŽP Ústí n. L., 30 p.
Usnesení vlády ČSR a ČR číslo 213 z r.1973, 315 z r.1974, 76 z r.1980 a 228 z r.1990 o vymezení postižených oblastí.

Appendix: The Basic and Used Data and Reference Sources

All of the mentioned basic data and reference sources were prepared and issued by the former Research Institute for Building and Architecture (RIBA, Czech abbreviation VÚVA) Prague, liquidated in 1994, and by its former Centre for Environmental Studies, located in Ústí nad Labem, Northern Bohemia, in the years 1992 and 1994.

1. Metodika hodnocení ekologické zátěže území České republiky na rok 1993 (Ecological Load Assessment Methodology – The Proposal for the Czech Republic Area and 1993 year), February 1993.
2. Metodika hodnocení ekologické zátěže na příkladu území okresů Liberec a Teplice (Ecological Load Assessment Methodology – Case Study based on the example of Liberec and Teplice District Areas), June 1993.
3. Hodnocení ekologické zátěže obcí České republiky (Ecological Load Assessment on Municipalities in the Czech Republic), November 1993.
4. Hodnocení sociální zátěže obcí České republiky (Social Load Assessment on Municipalities in the Czech Republic), November 1993.
5. Hodnocení zdravotní zátěže území České republiky (Health Load Assessent of the Czech Republic Area), November 1993.
6. Hodnocení celkové zátěže životního prostředí na území České republiky (Total Environmental Load Assessment on the territory of the Czech Republic), April 1994

Shrnutí

NOVÝ PŘÍSTUP K HODNOCENÍ A VYMEZOVÁNÍ POSTIŽENÝCH OBLASTÍ V ČESKÉ REPUBLICE

Na území České republiky jsou od roku 1974 vymezovány a vládou vyhlašovány tzv. postižené oblasti jako území s výrazně nepříznivými vlivy na přírodní a životní prostředí, zdraví obyvatelstva a jeho životní úroveň, v nichž bylo a je potřebné přijímat zvláštní ochranná a kompenzační opatření. Podle poslední úpravy v roce 1990 je v ČR vymezeno celkem 17 takových postižených oblastí – devět regionů a osm měst – na 10 % rozlohy a s 39 % obyvatelstva ČR.

Nový přístup k řešení problémů životního prostředí v ČR vyvolal na počátku 90. let mj. i požadavek na revizi jejich vymezení. Ministerstvo životního prostředí ČR zadalo vypracování "Kritérií a metodiky pro vymezování a vnitřní diferenciaci ekologicky poškozených území ČR" a jejich ověření na území severozápadních Čech. Úkolem byl pověřen Výzkumný ústav výstavby a architektury (VÚVA) a jeho bývalé Pracoviště pro životní prostředí v Ústí n. L.

Předkládaný příspěvek čerpá z výsledků prací dosažených za vedení jeho autora v průběhu let 1992 – 1994. Během relativně velmi krátké doby bylo nutné shromáždit, připravit a zpracovat velkou řadu údajů o stavu a vývoji životního prostředí v ČR a navrhnout nový způsob hodnocení a vymezování "postižených oblastí" včetně jejich vnější i vnitřní diferenciace.

Navrhovaný nový přístup k hodnocení úrovně životního prostředí spočívá v rozlišování, oddělování, ale i spojování tzv. ekologické, sociální a zdravotní zátěže území, a to pomocí

bodovací stupnice vybraných ukazatelů vypovídajících o rozsahu nebo stupni poškozování či ohrožování životního prostředí. Základní územní jednotkou pro hodnocení jsou zásadně celé obce (správní obvody), v některých případech a u větších měst to jsou však menší účelově vymezené části obcí.

Na základě četných diskusí a na základě ověřovacích testů na dvou modelových okresech byl navržen soubor 27 ukazatelů pro hodnocení tzv. celkové zátěže životního prostředí s bodovací stupnicí do maximálně 100 bodů. Z toho je určeno 14 ukazatelů a 75 bodů pro hodnocení tzv. ekologické, šest kritérií a 10 bodů pro sociální a sedm kritérií a 15 bodů pro zdravotní zátěž území. Pro každý z používaných ukazatelů byla vypracována vlastní hodnotící bodovací stupnice. Hlavní váhu v hodnocení získaly především faktory devastace povrchu a krajiny, znečištění ovzduší a vodních zdrojů.

Předložený příspěvek popisuje a hodnotí navrhovanou metodiku a vybrané ukazatele pro hodnocení uváděných typů zátěže území. Podle takto přijaté metodiky byla stanovena tzv. ekologická a sociální zátěž pro 1242 vybraných obcí ČR (z celkem 6100 obcí v r. 1992) včetně všech obcí SZ Čech a tzv. zdravotní zátěž pro všech 76 okresů ČR.

V další části příspěvku jsou uváděny hlavní výsledky tohoto hodnocení na území SZ Čech. Ty ukazují na mimořádně vysokou vnitřní diferenciaci mezi okresy a mezi obcemi. Na jedné straně tu nacházíme území s nejvyššími hodnotami zátěže – jako Most u ekologické, obec Rovná (okres Sokolov) u sociální a okres Cheb u zdravotní zátěže – ale i území s výrazně nízkými hodnotami zátěží. Z tohoto hlediska lze výsledky navrhovaného hodnocení považovat za velmi významné a důležité pro rozhodovací a plánovací činnost.

Podle výsledků použitého hodnocení lze více než 51 % celkového počtu obcí a plošné výměry a asi 83 % všech bydlících obyvatel na území SZ Čech označit za "ekologicky postižená území", která jsou dále navržena členit na tři stupně (na území s vysokou, velmi vysokou nebo kritickou zátěží). V kombinaci s výsledky hodnocení sociální a zdravotní zátěže lze vymezovat zóny různého typu a velikosti zátěže území.

Jedním z cílů uvedené metodiky a nového přístupu k hodnocení, vymezování a diferencování "postižených oblastí", jakkoliv je můžeme považovat za problematické a diskutabilní, je právě snaha přispět k objektivizovanému hodnocení a řešení problémů životního prostředí v nutně širším zájmovém prostoru naší republiky a tohoto regionu.

Obr. 1 – Indikátory pro hodnocení celkové zátěže životního prostředí a maximální možný počet bodů podle navrhované bodovací stupnice. Osa x – číslo indikátoru, osa y – počet bodů.

Obr. 2 – Ekologicky postižená území České republiky. Porovnání s "postiženými oblastmi" podle usnesení vlády ČR. 1 – postižené oblasti stanovené usnesením vlády ČSR č. 76/80. Ekologická zátěž: 2 – vysoká, 3 – velmi vysoká, 4 – kritická. 5 – města s ekologickou zátěží.

Obr. 3 – Ekologická zátěž území Severozápadních Čech. Hodnoceno vybraných 1242 z celkového počtu 6098 obcí. Stupeň ekologické zátěže: bílá – nehodnoceno, světle šedá – nízká, šedá – vysoká, tmavě šedá – velmi vysoká, černá – kritická.

Obr. 4 – Zdravotní zátěž území České republiky. Zdravotní zátěž na úrovni okresů (pro všech 76 okresů). Zdravotní zátěž: 1 – střední, 2 – vysoká, 3 – velmi vysoká. 4 – města s ekologickou zátěží.

Obr. 5 – Sociální zátěž území severozápadních Čech. Hodnoceno vybraných 1242 z celkového počtu 6098 obcí. Stupeň sociální zátěže: bílá – nehodnoceno, světle šedá – nízká, šedá – střední, tmavě šedá – vysoká.

Poznámka: Hranice obcí a okresů na přiložených mapách odpovídají roku 1992.

The proposed contribution is a part of the author's individual project, which has been done in the framework of the Global Security Fellows Initiative concerning the Black Triangle Focus Area, at the Faculty of Social and Political Sciences at the University of Cambridge (UK) in 1994 – 1995.

(Author is with Faculty of Environmental Studies, J. E. Purkyně University, Na okraji 1001, 400 01 Ústí nad Labem.)

Arrived to the editor's office on March 21, 1996
Recommended for publication by Ivan Bičík and Antonín Götz

GEOGRAFIE – SBORNÍK ČESKÉ GEOGRAFICKÉ SPOLEČNOSTI
ROK 1996 • ČÍSLO 2 • ROČNÍK 101

HANA KÜHNLOVÁ, KAREL KÜHNL

ENVIRONMENTAL EDUCATION AS PART OF GEOGRAPHICAL COURSES IN THE CZECH REPUBLIC – PROBLEMS, SUGGESTIONS, AND CHALLENGES

H. Kühnlová, K. Kühnl: *Environmental Education as Part of Geographical Courses in the Czech Republic – Problems, Suggestions, and Challenges.* – Geografie-Sborník ČGS, 101, 2, pp. 158 – 168 (1996). – Improvement of the environment is conditioned by a systematic environmental education. The role of geography in such an educational system is also crucial. As a result, geographical courses require changes. A sound knowledge of one's local region much contributes to the understanding of environment in the broad sense. Environmental education must include the historical development of natural and social elements as well as future prospects. The concept of eco-museum could bring much inspiration to this process. The article deals with the idea of eco-museum of Cental European importance which should primarily influence the environmental thinking of the population.
KEY WORDS: geographical education – social aspects of environment – eco-museum – environmental history.

Introduction

Czech Republic ranks among countries with the greatest extent of environmental damages. In most regions this damage includes not only various kinds of air, water, and soil pollution, as well as destroyed forests and other natural features. Moreover, damage of the social environment is equally or even more important since it brings long-lasting consequences and improvements are difficult. Increased morbidity and mortality (including infant mortality) are generally viewed as the best indicators of the overall damage of human environment. These indicators are, however, likely to be influenced to a lesser extent by pollution of air and other nature components and rather more by the lifestyle, attitudes towards one's health and by the health service[1)].

[1)] WHO (World Health Organization) claims that the quality of physical environment and lifestyle is by 80 % responsible for the health of population and the level and organization of the health service accounts just for 20 % (Dzúrová, D., 1993).

The international research project based in the Czech Republic "Teplice Programme" has come to similar results after 15 years of investigations. This project compares two regions: North-West Bohemia which has extremely damaged environment, and Prachatice District, South Bohemia, with high quality natural environment. So far, however, it has not been proved that damaged physical environment (especially air pollution) would influence the health of population more than improper lifestyle (bad nutritional habits, lack of physical activities, stress, smoking, impaired family relations, risky behaviour, etc.) (Rubeš, F., 1994).

Though the influence of damaged environment on human health is generally recognized, direct proofs that would support a close relation between the rate of environmental damage and mortality are rare (see Státní politika životního prostředí, Ministerstvo životního prostředí ČR, 1993).

It seems more and more likely that most health indicators of the human enivronment and its damage are conditioned by a broad array of circumstances. Apart from natural factors also psychological factors and the quality of social environment[2] play an important role. The quality of life, however, should not be reduced only to a reasonable state of health. It largely depends on other matters and facts many of which are closely related to space in general and contribute to the social climate (lifestyle, values, interpersonal relations, cultural level, attitudes towards traditions, leisure activities, etc.).

Such a complex approach towards the environmental issues and the quality of life should also be adopted in the environmental education and should become part of environmental awareness.

It is this awareness, however, which is on much lower level in Czechia compared with conditions in economically developed countries. The Communist regime banned many environmental information and provided no systematic environmental education. The roots of environmental degradation were not discussed or even hidden. Environmental issues received no official interest under Communism and the centrally planned economy postponed these problems to futere generations.

It will last long till environmental damages will be repaired and Czech population will again live in healthy conditions. Such a long-lasting process requires practical ecological provisions and also systematic environmental education. This education should stress intelligent and sensible approach towards natural and man-made structures. It also must encourage the role of behaviour and values that much contribute to the quality of social environment. Priority must be given to the concept of individual responsibility. Since environment is a complex concept, environmental education should be given a more important position in the framework of geographical education[3]. It is necessary to sort and process more information from other scientific branch-

---

[2] Social environment may be defined as the part of environment consisting of population itself, various population structures and interpersonal relations. Compared with the natural environment the social environment features material aspects (human beings) and also immaterial concepts as are language, culture, legal and ethic standards, traditions, values, etc. The quality of social environment is difficult to assess; it should be based on the complex quality of social indicators and social relations. The quality of social relations is influenced by the occurrence of negative social and demographic phenomena and features on one side and by progressive social facts on the other hand. As such, social relations indirectly indicate the quality of social environment (Illner, M. et al., 1989).

In the Czech Republic, many negative social attributes affecting the social environment occur in regions with the worst life conditions. These are typified by a high share of suicides, alcoholism and drugs, prostitution, children under threat, abortions, increased divorce rate, etc.

Social environment in the most devastated regions has been largely influenced by the degradation of countryside and the whole settlement structure. It included total clearance of many villages and towns, as well as negative changes of the urban landscapes (building of socialist-style housing estates). Ruthless approach towards cultural monuments was adopted and many were destroyed. All these aspects, however, occurred also in other Czech regions, though to a lesser extent.

[3] Environmental information and data were first included in Czech geography courses on primary and secondary levels as late as in the 1980s. Ironically, the importance of environmental education in Czechia has been even higher than in other countries. Apart from other reasons, the structure of geographical university education much contributed to such a delay. Environmental concepts were included into geographical courses at the university level later and to an incomparably lesser extent than in case of courses dealing primarily with

es. Apart from the traditional links with natural sciences (especially with ecology) geographical education is supposed to include sociological and economic data as well as information produced by physical and regional planning. Historical development of all environmental components should also be taken into account. It is most likely that geographical education enriched in the above mentioned way would occupy more significant position in the process of raising environmental awareness and improving the quality of life especially among the young generation. To achieve this goal, however, it is necessary to alter the contents of geographical education on primary and secondary levels. Also university courses that provide training for future geography teachers need changes.

Environmental Issues as Part of Geographical Education

The concept of landscape ecology and assessing of socioeconomic landscape components (including basic principles of regional planning) have received a great interest among school geographers, textbooks authors, and teachers in developed countries over the past decade. Human values, behaviour, and responsibility are viewed as part of the decision-making process. Moreover, the scope of education clearly tends towards the extension beyond geographical boundaries: students and pupils recieve a wide range of information based on interdisciplinary contexts. Currently there are two main directions. First, the education focuses on global problems and problem regions of the world. Second, deeper understanding of the domestic region, town, and place of residence is stressed; raising of environmental awareness is viewed as very important.

The above mentioned approach conforms the basic principles of the IGU International Charter of Geographical Education[4]. The Charter emphasizes the importance of geography for the environmental awareness of future generations.

The Czech educational system gradually adopts the general trends in geographical education and its contents. Sections on landscape and environment were first included in teaching programmes and geography textbooks on primary and secondary schools at the turn of 1970s and 1980s. Information on

---

biology, chemistry, agronomy, and even with some technical sciences. A general beleif that environmental issues have little to do with geographical education and research long prevailed among the Czech geographical community. As a result of this delayed and careful approach towards environemntal concepts, the geographical methodology of assessing the environmental quality received little attention. Geographers just described the state of environmental damage or the protection of natural components. A complex approach towards the environment was rarely adopted and concerned first of all only the natural sphere. Sociogeographical aspects of the environment are still taken into account only exceptionally, both in empirical research and in the framework of theory and methodology. Though synthesis is one of the basic geographical concepts, in the case of environmental issues this approach has not been adopted over many years. This fact is reflected also in the geographical education. Description still prevails and individual environmental components are just classified. Complex approach towards environmental issues based on solving problems is rare.

[4] The International Charter of Geographical Education was approved by the participants of the 27th IGU Congress in Washington D.C., 1992. The Charter calls for general attention to geographical education and to its key role in the process of shaping future generations responsible for this world (Haubrich, H., 1994).

nature protection and quality of life (perceived as the level of man-induced damage of natural environment), on the most damaged regions and partly on measures taken to improve the state of environment in Czechoslovakia and abroad received more and more interest in the course of 1980s. Before the political changes in 1989, however, the environmental "education" was limited just to partial information. Deeper investigations were not presented, the roots of topical problems were not discussed and little attention was given to possible solutions. Many facts were falsified or even tabooed and information misinterpreted. The regime did not encourage open discussions about the environmental devastation that included open pit mining, plants based on burning of low quality coal, and toxic waste in water and soil. As a result, sound and complex environmental training was not supported. The education was much focused just on the necessity to protect natural components against pollution.

Relatively important changes have been enforced over the past five years (1990 – 1995) in the field of general concept, contents and methodology of the environmental education in the Czech Republic. Above all, information on the state of the environment are not banned any more and real roots of the environmental problems are discussed and assessed. Environmental issues became integral part of many geographical courses and programmes. The improvement of environmental knowledge is now perceived as one of chief targets geographical education should be aimed at. Geographical textbooks released after 1989 also devote much more attention to environmental problems.

The application of recent educational trends much depends on teachers, their activity and scope of knowledge. The traditional educational concepts still much influences most teachers. The young generation, however, rapidly adopts new ways of thinking and the practical educational process gradually becomes to conform West European standards. The general prestige of geography as a subject is thus likely to be increased.

The environmental section of geographical education in the Czech Republic will be influenced by practical needs. It also will reflect foreign experience in this field. The main trends in foreseeable future should be based on the following ideas:

a) The knowledge of local region and municipality should be extended. Environmental and landscape changes in the past and resulting consequences must be stressed. It is necessary to devote more attention to future environmental development including desired changes of rural and urban landscapes, quality of housing, interpersonal relations, and generally the quality of life.

b) Geographical education should emphasize the activities and abilities needed for the environmentally responsible decision making (issues concerned with housing, new planning and landscape concepts, etc.). More attention should be devoted to activities, discussions, projects, and scenarios concerning the development of society within the environmental framework.

It is especially important to promote the idea of personal responsibility for sustainable development and generally raise the global environmental awareness.

a) To extend the knowlege of local region and place of residence is an efficient way how to link geographical education with environmental issues. It

also creates conditions for improving the human attitudes towards local area, especially among youngsters[5]. Deeper local knowledge enables comparison with other regions and creates a sound base for understanding the coexistence between society and environment. Theoretical statements and isolated pieces of information concerning environmental damages are thus replaced by a broader approach towards historical contexts of the state of local environment. The interconnection between the perception of local landcscape or local settlement and the general landscape development is especially important. The detailed scale also enables to observe the everyday life. If students would understand the current state based on the knowledge of the past, they would be more likely to adopt knowledgeable approach towards the future and undertake environmentally responsible decisions.

b) Observation of the local environment produces a diverse material for informal environmental education. Natural and social features can be described, sorted, and assessed in field classes. Some projects and scenarios aims to solve real (or simulated) problems. Activities focused on improving the local environment and on raising the environmental awareness of students' families should also be supported. Regular discussions on current issues of local, national, and global importance are important, too, as are round tables with invited guests of various professional background. Leisure time of youngsters should be enriched by activities concerned with environmental protection and sustainable development.

Generally, environmental education should be more future-oriented (in the sense of future space-time relations) and based on examples from familiar regions. To do so, it is necessary to combine the assessment of natural and social components and adopt integrated educational approaches.

The transition of geographical education aims to deepen the environmental thinking of Czech population. The basic approach towards environmental studies as part of geography, however, should be changed.

The Concept of Eco-Museum as a Method how to Extend Environmental Thinking and Enrich Geographical Education

Geography as a scientific discipline undergoes permanent changes. Environmental issues in the broad sense as well as historical contexts become increasingly important in current geography. The environmental aspects of historical development are devoted great attention in many developed countries. Taking such contexts into consideration could iniciate changes in contents and scope of Czech geographical education, too.

The environmental history ranks among the modern historiographic subdisciplines. It studies ecological aspects of historical events in the broad context. Related to the environmental history is the historical geography of environmental changes – discipline which has originated in Europe in mid-1980s. Environmental history is the history of nature and its changes as perceived by humans; the history of natural images reflected in ideas, culture, and art;

[5] The experience from geographical education in developed countries, for instance in Switzerland, has proved this fact (Aerni, K. et al., 1993). The same is true with foreign geographical courses, programmes, and textbooks in Germany, Austria, etc. (Geographie 1985, Lehrplan 1991).

the history of environmental politics. Environmental historians continue to emphasize the links with other scientific branches – with geography, ecology, sociology, philosophy, etc. Environmental history[6] has developed rapidly especially in the U.S.A. (Jeleček, L., 1993).

Neither Czech geographers, nor historians have systematically studied the environmental aspects of human history so far. The knowledge of history, however, could much contribute to the process of environmental repairs and to raising the environmental awareness.

The concept of eco-museum[7] is an example of the historico-geographical approach towards the environmental studies at a small regional scale. The eco-museum itself proves how important for geographical education are links with history, ecology and other branches as ethnology, urban planning, history of culture and architecture, sociology, technical sciences, economics, philosophy, etc.

G. H. Riviére, father of the eco-museum concept, conceived it in the end of 1970s as an integral image of nature and life on a relatively small area over a certain period of time. The idea of spacial development has thus been stressed. Riviére's ideal eco-museum would show human beings as part of dynamic bilateral relations between man and environment. Under the term "environment" he understood the entire space, the realm of nature and culture. Apart from the rural environment, often shown in vernacular architecture reserves, the Riviére's concept also includes the urban and industrial environment. A permanent exhibition shows the historical development and the character of respective region is documented in crucial stages of natural and human history up to the present. Future prospects are also included. Important realities that directly influence the future development are emphasized. Apart from the permanent historical exhibition the eco-museum also contains natural and cultural features in the open air that typify the area and contribute to the understanding of local environment. These include rural, urban, and industrial architecture, historical sites, archaeological findings, natural phenomena (geological freaks, habitats of unique animals and plants), typical man-induced structures, etc. Such objects are linked with introductory trails and provided with written information[8]. This idea, however, does not allow to place an eco-museum under one roof. In contrast to an eco-museum, a traditional museum is usually concerned with a larger region and the local population does not directly take part. On the contrary, the Riviére's eco-museum concept underlines the role of local people. Locals are

---

[6] Environmental history should be distinguished from historical ecology. The former deals with the development of nature-society relations and their positive and negative consequences on both sides. The latter studies namely negative aspects of human activities in the sphere of nature (Jeleček, L., 1993).

[7] To a certain extent, the idea of eco-museum in general has been influenced by the crisis of traditional museums. These do not reflect modern needs and new forms are looked for. Georges Henri Riviére, founder of the Museum of Folk Art and Traditions in Paris, first promoted the idea of eco-museum (Hinten, W., 1985, Riviere, G. H., 1985). The word "eco-museum" which reflects the special environmental concern has been first created by Huguesde Varine Bohan, Riviére's successor in the International Council of Museums. R. Poujad, French Minister for Environment, officially approved this term.

[8] The idea, aims, and practical forms of an eco-museum, however, differs significantly from museums in the open air, vernacular architecture reserves, and introductory trails that have more limited scope.

invited to cooperate according to one's abilities and interests. Since they are asked to contribute with their knowledge and experience and as such to influence the future development of their domicile, locals mostly take the creation of eco-museum seriously. Being co-authors, local people are also likely to take part in promotion and advertising[9].

France was the first country that has pioneered eco-museums since 1980s (Ecomusée de la Grande Lande de Gascogne, Ecomusée du Mont Lozere, Ecomusée de la communauté urbaine Le Creusot-Montceau-les-Mines, etc.). Other developed countries such as The Netherlands and Switzerland followed.

We take the structure and purpose of the Simplon Pass Eco-Museum, Switzerland, as an example.

The foundation that has built this museum in between 1991 and 1996 aims to provide visitors with a comprehensive picture of the economic and cultural life in the Simplon region. It is located on the important ancient trade route over the Alps in a unique natural environment. The Simplon Eco-Museum administration is housed in the rconstructed historical building at Simplon-Dorf. Permanent exhibition on local history opens there in July 1996. The main focus, however, is put on the reconstructed Stockalper Route that came into existence in the 17th century and followed the mediaevel route over the pass. The latter linked Northern Italy with French market places. Brig in the Rhône Valley and Gondo at the Italian border were important settlements at both sides of the pass. This trade route provided the source of living for local population over more than one hundred years and it brought prosperity to the whole region. The reconstruction aims to preserve the route for Swiss people and foreigners passing over Simplon. Selected natural and cultural objects scattered along the 35 km long section gradually become parts of the eco-museum. Apart from the reconstructed route itself these are former store houses, 17th century shelters and huts, mountain pub and chapel of the same period, etc. The eco-museum management also aspires to acquire some histrocally important monuments that would house various regional exhibitions (Kühnlová, H., 1993).

The concept of eco-museum is based on the study of local development and should result in a complex picture of the respective region. It is a picture of nature which has been gradually changed by humans and a picture of cultural and ecomomic activities that are largely influenced by the natural and social environments. Apart from the local context also relevant national and international circumstances are presented.

The eco-museum ensures the protection, restoration, and revitalization of natural landscape and man-made structures. It is also concerned with revival of traditions and conservation of cultural monuments.

Educational programmes and raising the public awareness are important issues, too. These include widening of interests among locals and enriching the tourist and recreational activities as well as the upgrading the knowledge on local region in the framework of general education.

---

[9] The organizational structure of and eco-museum is usually based on three committees with precisely specified tasks: scientific committee, users committee, and administrative committee.

Members of the scientific committee are mostly university scholars – experts in various branches. The selection is influenced by practical needs of the respective region. Generally, experts in geology, biology, geography, natural and social ecology, archaeology, general history, art history, ethnology, agronomy, and other branches take part.

Local people become members of the users committee. They are grouped into various supporting associations and clubs.

Institutions providing the financial support and management of the eco-museum have representatives in the administrative committee.

In general the eco-museum should contribute to upgrading the status of the respective region in people's minds and to enforcing local roots. All this is based on a deeper knowledge of local environment and local affairs. This improved knowledge and changes in behaviour that include accepting more responsibility in decision making are part of the local patriotism and pride.

The stimulative ideas on which eco-museums are based could be well applied in the Czech Republic, too. Czechs are mostly educated people and the country boasts old cultural traditions. Many Czech citizens have a wide range of interests including reading, regular trips, visits to museums, monuments, and introductory trails. These activities are especially frequent among young families. Since the standard of living in Czechia is expected to rise under new conditions, it is likely that based on the long-time experience new introductory trails will come into existence and also eco-museums might be built.

The coal mining region in North-West Bohemia would be an ideal setting for such an eco-museum. This area suffers from high air-borne pollution and severe devastation that rank among the worst of all Europe.

The landcapes of North-West Bohemia have been devastated by the ruthless opencast coal mining and by high concentration of coal-fired plants. Some parts really resemble a lunar landscape: giant open pits, huge heaps of useless waste, polluted underground water, hazardous dumps, and devastated forests.

This region was inhabited by Germans and Czechs side by side over many centuries. Thus, it was a setting of unique historical development. Fifty years ago, however, an important population change ocurred there: Germans were expelled and the region has been resettled by people from various parts of Czechoslovakia. North-West Bohemia suffered from a large migration turnover also under the following "socialist" period. The stability of local population remained low over a long time. The border regions show a large population instability even now.

High level of social pathology is typical for North-West Bohemia. The local population is by Czech standards less educated. The relatively high proportion of Gypsies (Romanies) makes a lot of problems, too, since many do not accept the general social standards. Certain diseases are more frequent due to the unhealthy way of living that also contributes to higher divorce rate, criminality, and dependence on narcotic drugs.

The historical part of North-West Bohemian eco-museum would focus on main stages of development from the ancient times up to the present. The gradual environmental devastation resulting in a total damage would be demonstrated at the background of social development. The settlement history, population composition, as well as the destruction of social environment under Communism would be shown.

Typical natural and cultural phenomena of this region – witnesses of the landscape degradation – would form parts of the eco-museum, too. There would be examples of reclamation and forest revitalization. Devastated cultural monuments as well as those that escaped damage would be shown (Most, Jezeří Castle), and also the prefabricated "socialist" architecture. Some urban sites are ideal candidates to become parts of the eco-museum, too: Kadaň (historic town), Duchcov (historically important town where the urban structure has been recently deformed), and Teplice (the spa district). Other routes could direct visitors to the attractive recreational areas outside the coal mining region, as are Děčínské stěny (Děčín Rocks), and České Středohoří (Bohemian Highlands). Some environmentally friendly establishments could be linked to a separate exhibition focused on the changing environment in North-West Bohemia. These could include an ecological dump site, coal-fired plant, industrial factory, or a residential area. The issue of through truck traffic should be demonstrated, too. The exhibition itself should be located in a carefully selected place where examples of the recent damage would be seen. Ideally, it would become an important centre for environmental education.

Creation of such an eco-museum in the coal mining district of North-West Bohemia would inevitably bring many problems to cope with. Compared to the existing eco-museums throughout Europe it would be interspersed on quite a large region (approx. 1,500 km^2) which does not attract much tourism and recreation in the traditional sense.

The eco-museum, however, should become a touristic destination, too. Moreover, the area of interest will continue to face complicated technical, economic, environmental, and social problems. Nevertheless, putting the eco-museum idea in action would much contribute to upgrading the environmental education. Regarding the size and scope it would become a unique project in the European context.

North-West Bohemia would take benefits from the eco-museum, too. It would undoubtly increase the local environmental awareness and contribute to the improvement of social climate which is a crucial condition in the process of environmental upgrading[10].

The concept of eco-museum gives a complex picture of the environmental conditions in a selected region. It proves that complex landscape studies make sense. The historical approach is crucial in the process of making oneself familiar with the respective region which is an essential condition for understanding the past development and current problems and for future considerations. This broad approach towards the environment could much enrich the environmental education and also improve the level of courses on regional geography in the modern sense.

Conclusions

Environmental awareness and environmental thinking must be upgraded if the environment in the Czech Republic should be improved. Geographical education that encompasses both the natural and social aspects of the environment should in future become more concerned with environmental knowledge and activities. Practical education should ever more be focused on the environmental responsibility as a message for future generations and on encouraging values necessary for a better quality of life. Such a shift, however, reguires reformes in the essence of teaching geography. The traditional descriptive form and separate assessment of individual geographical aspects should be replaced by an integrated environmental concept. In order to successfully make this difficult transition of geographical education, geography as a science needs structural and conceptual changes, too.

Eco-museums are institutions that trace the environmental history of small regions from the ancient times to the present and suggest how the future trends could be like. Eco-museums effectively contribute to raising the environmental awareness and encourage the environmental concept as part of geographical education. Since the Czech environment is infamous and ranks among the worst in Europe, the authors take the opportunity to suggest the project of eco-museum in the coal mining region of North-West Bohemia. This proposed eco-museum would have brilliant prospects to become an important Central European centre for environmental education.

[10] There are many other Czech districts where an eco-museum – if properly managed – would contribute to protection of cultural monuments and to nature conservation. Let us mention the National Parks: Krkonoše (Giant Mountains), Šumava (Bohemian Forest), and Podyjí. The early industrial regions (Kladno, Ostrava, Liberec-Jablonec) would also provide a suitable setting, as would the spa district in West Bohemia, the Třeboň region dotted with lakes and cultural monuments, Valašsko (East Moravia), and others.

References:

AERNI, K., ENZEN, P., KAUFMANN, U. (1993): Landschaften der Schweiz. Geographica Bernensia, Bern. Band I, 115 s., Band II, 549 p.
BAUER, L. (1986): Erdkunde für Gymnasien in Bayern 11. Schroedel, Berlin, 144 p.
BOYLAN, P. J. (1982): The New Role of a Regional Museum Service in Environmental. In: Museums Journal, The Museums Association, vol. 82, No. 1, London, pp. 21-23.
HAUBRICH, H., ed. (1994): International Charter on Geographical Education. Commission on Geographical Education IGU, Freiburg.
Das Museum auf Wanderschaft (1993). Beilage zum Walliser Bote vom 25. September 1993.
DZÚROVÁ, D. (1993): Zdravotní stav obyvatel a kvalita životního prostředí. Regionální souvislosti. Kandidátská disertační práce, UK Praha, 136 p.
Geographie und Wirtschaftskunde. Lehrplan-Service. Kommentarheft 1, 2. Österreichischer Bundesverlag, Wien 1985, 145 p.
HINTEN, W. (1985): Zur Konzeption des Ecomusée in Frankreich. In: Kulturgeschichte und Sozialgeschichte im Freilichtmuseum. Museumsdorf Cloppenburg, p. 88-101.
ILLNER, M. et al. (1989): Regionální problémy sociálního rozvoje ČSSR. Expertizní studie. Ústav pro filozofii a sociologii ČSAV, Praha, 88 p.
JELEČEK, L. (1994): Nová historiografie? Environmentální dějiny v USA: vývoj, metodologie, výsledky. Český časopis historický, 92, No. 3, Praha, pp. 510-540,
KROSS, E. (1991): "Global denken – lokal handeln" – Eine zentrale Aufgabe der Geographie-Unterrichts. In: Geographie heute 12, H.93, pp. 40-45.
KÜHNLOVÁ, H. (1994): Simplonský průsmyk – historická dopravní trasa a projekt ekomuzea. Geografické rozhledy, 4, No. 4, Praha, pp. 98-101.
KÜHNLOVÁ, H. (1995): Zeměpis pro život. Pracovní učebnice. Nakladatelství ČGS, Praha.
Lehrplan für das bayerische Gymnasium. Fachlehrplan für Erdkunde. Amtsblatt des Bayerischen Staatsministeriums für Unterricht, Kultus, Wissenschaft und Kunst. Teil 1. München 1991, pp. 1325-1380.
LOB, R. E. (1995): Schulgeographie und Umwelterziehung vor neuen Aufgaben. In: Praxis Geographie 7-8, pp. 74-76.
MAUDE, A. (1992): Integrating Human and Physical Geography? Teaching a First Year Course in Environmental Geography. In: Journal of Geography in higher Education. Vol. 16 (2 issues).
MYERSON, G., RYDIN, Y. (1994): "Environment" and planning: a tale of the mundane and the sublime. In: Environment and Planning D: Society and Space 1994, vol.12, pp. 437-452.
RIVIÈRE, G. H. (1985): Définition évolutive de l écomusée. In: Museum, UNESCO, Paris, n. 148 (v. 37, n. 4).
RUBEŠ, F. (1994): Zdravotní program Teplice. Geografické rozhledy, 4, No. 2, Praha, p. 59.
SCHLAPPI, CH., BADILATTI, M. (1995): Unser Quartier. Ein Unterrichtsmittel über Quartierentwicklung und Ortsbildpflege am Beispiel des Thuner Westquartiers. Berner Heimatschutz, Bern, 80 p.

Shrnutí

ENVIRONMENTÁLNÍ VÝCHOVA JAKO SOUČÁST GEOGRAFICKÉHO VZDĚLÁVÁNÍ V ČESKÉ REPUBLICE – PROBLÉMY, NÁMĚTY A VÝZVY

Česká republika patří mezi země s nejrozsáhlejším poškozením životního prostředí. Ve většině postižených území však nejde jen o různé stupně a projevy poškození přírodních složek krajiny. Stejně významné, a mnohdy významnější ve smyslu dlouhodobých důsledků a obtížnosti náprav, je narušení sociálního prostředí.

Zvýšená nemocnost a úmrtnost obyvatelstva, které jsou nejčastěji považovány za nejprůkaznější indikátory celkové narušenosti životního prostředí člověka, jsou pravděpodobně menším dílem způsobeny poškozením ovzduší a ostatních přírodních složek prostředí a spíše větším dílem celkovým životním stylem, postojem a chováním lidí k vlastnímu zdraví a úrovní zdravotní péče. Prokazuje se, že úroveň zdravotních indikátorů narušenosti životního prostředí je důsledkem působení podstatně širšího okruhu faktorů, mezi nimiž kromě faktorů přírodního charakteru zaujímají významné místo také faktory psychologické a kvalita sociálního prostředí. Sociální prostředí má na rozdíl od přírodního prostředí nejen svou materiální složku, ale i složku nemateriální (způsob života, kulturní vyspělost

obyvatelstva, právní a morální normativy, hierarchie životních hodnot, mezilidské vztahy, vztah k tradicím, využití volného času atd.). Kvalita sociálního prostředí je těžko měřitelnou veličinou, kterou je nutno odvozovat od kvality komplexu sociálních znaků a vztahů obyvatelstva. Na základě intenzity výskytu sociálně patologických, negativních demografických a naopak sociálně progresivních jevů lze hodnotit různou kvalitu sociálních vztahů a indikovat tak nepřímo i kvalitu sociálního prostředí.

Chápání životního prostředí a kvality života v tomto širším kontextu je nezbytné postupně promítat do celkového environmentálního uvědomění obyvatelstva, které je jedním z nezbytných předpokladů pro zkvalitnění životního prostředí v České republice. Je proto zapotřebí prohloubit environmentální výchovu ve všeobecném vzdělávání a v jeho rámci pak podstatně zkvalitnit environmentální složky geografického vzdělávání.

Nižší úroveň environmentálního uvědomění obyvatelstva České republiky ve srovnání s obyvatelstvem nejvyspělejších zemí je důsledek záměrné neinformovanosti a chybějící soustavné environmentální výchovy v období minulého režimu.

S odvoláním na soudobé světové trendy ve vývoji obsahu geografického vzdělávání zaměřující se stále více na životní prostředí a kvalitu života se v článku konstatuje naléhavá potřeba přestavby platných učebních osnov zeměpisu na všeobecně vzdělávací škole. Tato transformace však není myslitelná bez určité proměny v přístupech ke studiu životního prostředí v geografii jako vědním oboru, z něhož školská geografie vychází.

Do výuky zeměpisu na obou stupních všeobecně vzdělávací školy v České republice se širší informace o životním prostředí dostaly teprve v 80. letech. Jednou z příčin opožděného nástupu k této problematice, jejíž důležitost a naléhavost vystupovala v České republice ještě výrazněji oproti jiným zemím, byla také skutečnost, že česká univerzitní geografie se začala ekologickou tematikou systematičtěji zabývat podstatně později a v nesrovnatelně menším měřítku než jiné vědní disciplíny (biologie, chemie, agronomie a některé další technické obory).

V úvodu kapitoly o zaměření obsahu geografického vzdělávání na životní prostředí jsou stručně shrnuty hlavní směry zájmů školských geografů ve vyspělých evropských zemích.

Po shrnujícím přehledu vývoje pojetí a obsahu výuky o krajině a životním prostředí v České republice a po informaci o hlavních koncepčních změnách po roce 1989 jsou uvedeny dva důležité a dosud opomíjené úkoly rozvoje koncepce environmentálních složek geografického vzdělávání:

a) Prohloubit poznávání místního regionu a obce se zaměřením na dějinné souvislosti proměny krajiny a vývoje životního prostředí.

b) Výrazněji orientovat výuku zeměpisu na činnosti a na dovednosti rozhodovat se s ohledem na životní prostředí (např. v rámci bydlení, při diskusích o plánovaných změnách v sídelních útvarech i v krajině apod.), věnovat více prostoru činnostem, diskusím, projektům a scénářům zaměřeným na vývoj společnosti v prostředí.

Autoři článku dále doporučují širší a integrovaný přístup při poznávání životního prostředí místního regionu obohacený o historický a také futurologický pohled na vývoj přírodní i sociální složky krajiny. Za myšlenku podnětnou pro pojetí geografie menší oblasti i pro posílení environmentální výchovy obecně je autory považována koncepce ekomuzea.

Ekomuzeum je chápáno jako interpretace přírodní i sociální složky menšího krajinného celku prostřednictvím historické expozice v centrální budově muzea a na ni navazujících přírodních i kulturních objektů přímo v krajině, které představují reprezentativní prvky dokládající koexistenci člověka a prostředí v dějinném vývoji. Tvorba ekomuzea založená na výzkumu vývoje regionu směřuje k vytvoření komplexního obrazu oblasti – obrazu přírodního prostředí měnícího se postupně pod vlivem člověka a obrazu kulturní a hospodářské činnosti člověka ovlivňované přírodním i sociálním prostředím, a to nejen v měřítku místním, ale i v širších regionálních souvislostech národních i nadnárodních.

Stať obsahuje námět na vybudování ekomuzea středoevropského významu, a to v pánevním prostoru severozápadních Čech, který v rámci Evropy patří k oblastem s největším znečištěním ovzduší, s rozsáhlou devastací krajiny a s narušeným sociálním prostředím.

Článek je výzvou k přestavbě pojetí a obsahu geografického vzdělávání, které by se v budoucnu mělo podstatně významněji podílet na ovlivňování environmentálního myšlení obyvatelstva.

(Authors are with Dpt. of Social Geography and Regional Development, Faculty of Science, Charles University, Albertov 6, 128 43 Praha 2.)

Arrived to the editor's office on February 6, 1996
Recommended for publication sby Ivan Bičík and Karel Pivnička

MARTIN BRANIŠ

ENVIRONMENT IN THE CZECH REPUBLIC: STATE OF THE ART AND RECENT DEVELOPMENT UNDER ECONOMIC AND POLITICAL TRANSITION

M. Braniš: *Environment in the Czech Republic: State of the Art and Recent Development Under Economic and Political Transition.* – Geografie-Sborník ČGS, 101, 2, pp. 169 – 179 (1996). – Environmental protection in the Czech Republic has undergone crucial changes since 1989. The initial improvement of environmental quality, however, should be viewed to a great extent as a passive consequence of the inevitable economic restructuring. It is especially the case of chief airborne pollutants that were much reduced since coal mining and the use of fertilizers has been restricted. On the other hand the lower production and use of ozone-destructive chemicals as well as investments into desulphurization of plants are examples of environmental improvements by purpose. The transition towards market economy brings also some negative effects. The amount of municipal waste has risen and public transportation has lost its previous importance. In spite of current positive trends in the environmental protection this branch will require a lot of money. The share of environmental expenses on GDP in the Czech Republic is at the moment two to four times higher than in many EU countries.
KEY WORDS: Czech Republic – environment – economic transition.

1. Introduction

The first detailed report on the state of the environment was compiled in 1983 by members of the Czechoslovak Biological Society, Academy of Science (Moldan, B et al., 1983). Since this report confirmed the catastrophic state of natural environment in early 1980s – fears shared by experts and general public – it evoked negative responses within the official Establishment. The stubborn effort of the Communist government to keep pace with the economic development in the West at any expense was the source of evil. Expenses included unlimited exploitation of natural resources, landsacape devastation, deteriorated environment mainly in cities and towns, around giant plants and industrial establishments.

Though many authors of the above mentioned report were oppressed or even prosecuted, five years later the Biological Society again prepared an analysis of the environment in Czechoslovakia (Vavroušek, J., Moldan, B., 1989). The latter report was a detailed one and had much broader scope. It was no longer just a topic of conspiratory discussions among Society members. It was a basis for the complex and respectable publication known as "Blue Book" (Moldan, B., 1990). The Blue Book was among the first documents on the state of the environment readily available to experts, state administration, and the public after 1989. It came into existence sooner than all economic and political analyses and served as a reliable base for constructive environmental activity immediately after the political change of 1989.

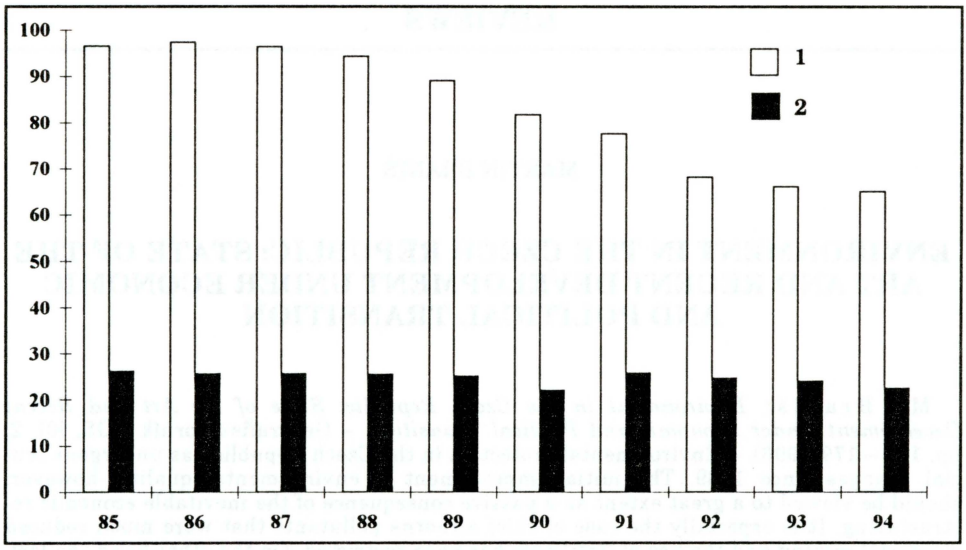

Fig. 1 – Coal Production in the Czech Republic (million of tonnes per year); 1 – brown coal, 2 – black coal

The environmental situation in the Czech Republic at the turn of 1980s and 1990s was a genuine disaster by European standards. The immense amount of coal production (almost 100 million tons per year in the period 1984 – 1987; see Figure 1), exploitation of raw materials and consequent air and water pollution, soil degradation due to heavy agricultural machines and excessive use of fertilizers especially in infertile mountainous areas – all this exceeded reasonable environmental limits. The unsatisfactory state of general health mainly in mining and industrial areas, as well as in big cities, was also perceived as being related to the polluted environment.

"Diagnosis has been identified". For the sake of environmental improvement in the beginning of 1990 there was no urgent need for more environmental experts who would carry out more and more detailed analyses. The monitoring network was also satisfactory. Even raising public awareness did not belong among the chief priorities. Many foreign experts were amazed by the activities of NGOs and by public knowledge about the environment. What really was urgently needed in Czechoslovakia of early 1990s, however, could not be provided by general public and NGOs: it was the legal and institutional framework for environmental protection and conservation.

2. Environmental Development Since 1990 – Causes and Trends

Industrial restructuring, privatization, controlled and sometimes also spontaneous disintegration of huge companies have brought significant – yet often unplanned – environmental improvements. Industrial decline (first of all decrease of heavy industries) and especially decline of brown coal production, stone, sand and gravel mining, and the gradual decrease of uranium industry has resulted in radical decrease of airborne, water, soil, and rock pollution (Figure 2).

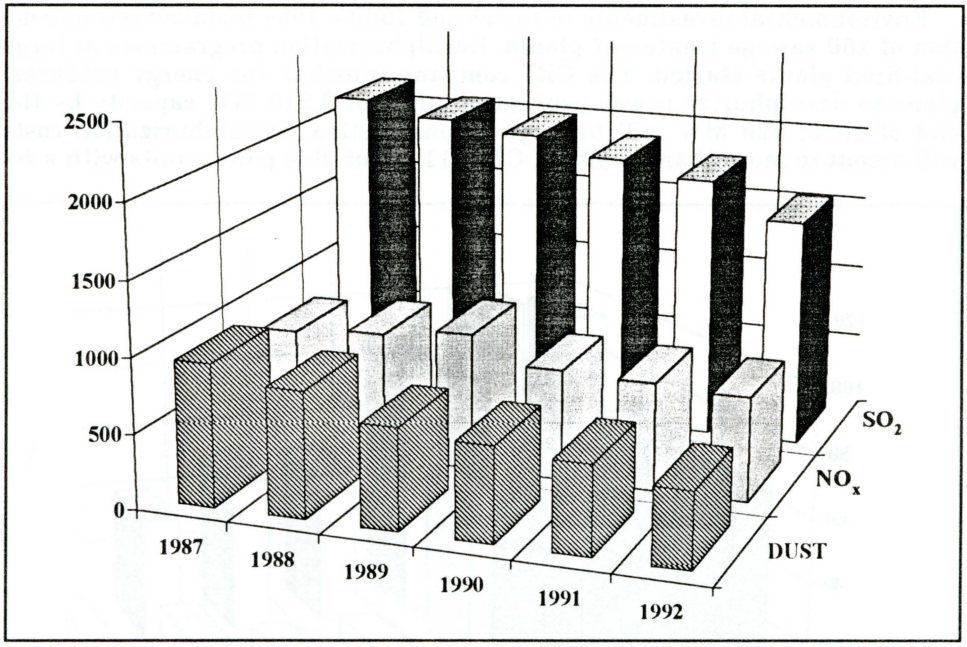

Fig. 2 – Total Emissions of Main Airborne Pollutants in the Czech Republic (thousands of tons per year)

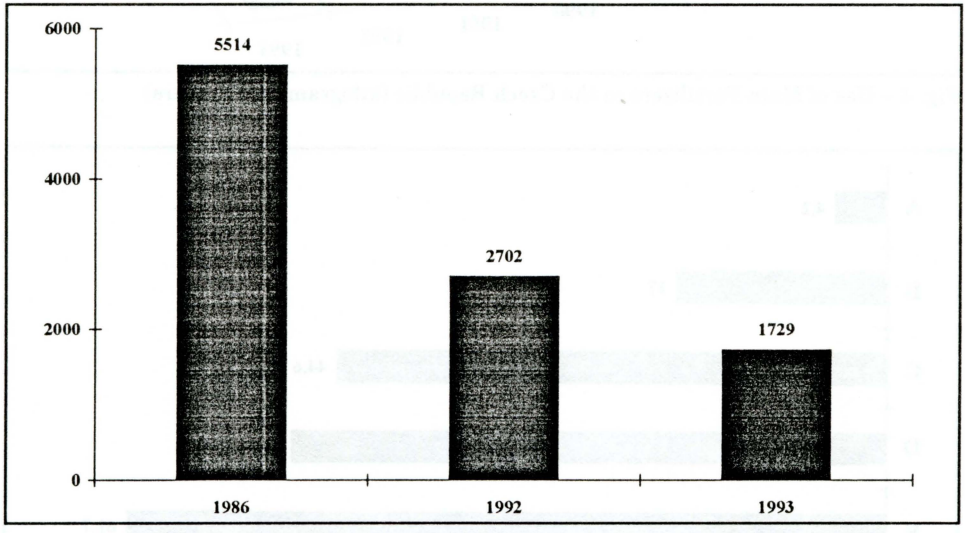

Fig. 3 – Consumption of CFC (11, 12, 113, and 115) in the Czech Republic (tons per year)

Chief airborne pollutants have been reduced by 20 % or even more. Harmless fuels (natural gas) became more frequent and exports of electrical energy declined. Production and consumption of ozone-destructive chemicals has much decreased, too (Figure 3).

Environmental investments in the period 1990 – 1994 included reconstruction of 150 sewage treatment plants. Desulphurization programmes at large coal-fired plants started. The ČEZ company (number one energy producer) plans to desulphurize power generating units of 3,610 MW capacity by the end of 1996; 220 MW will undergo reconstruction. Desulphurization costs will amout to more than 10 billion CZK. 11 unsuitable power units with a to-

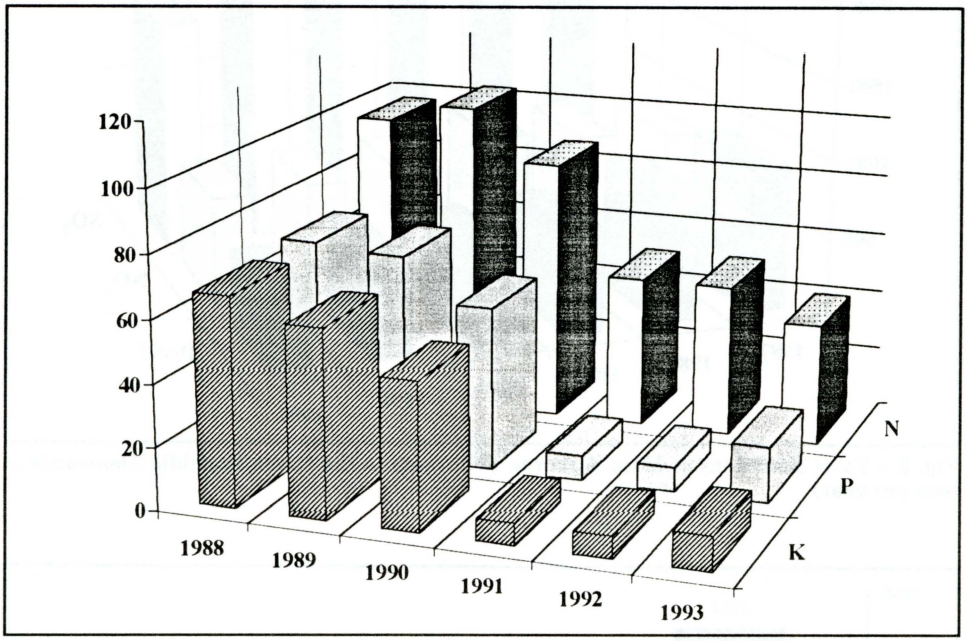

Fig. 4 – Use of Main Fertilizers in the Czech Republic (kilograms per hectare)

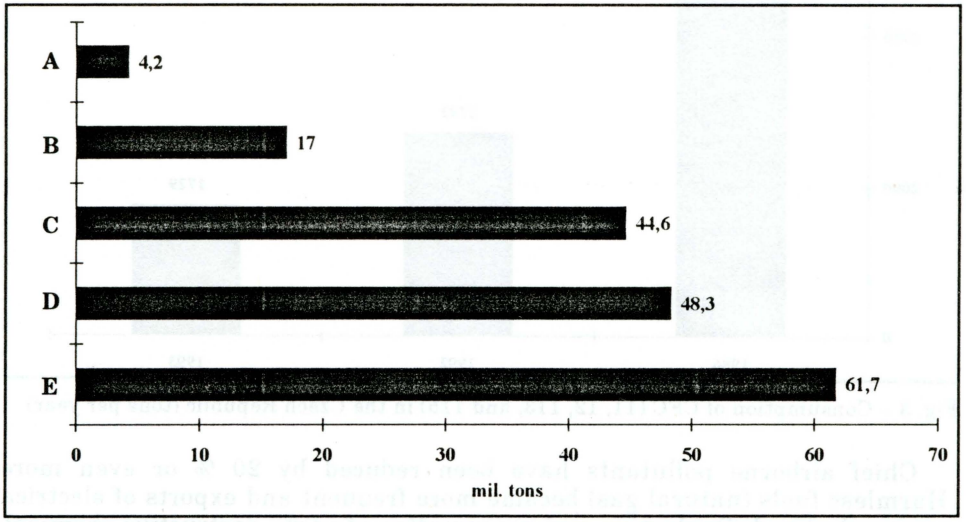

Fig. 5 – Production of Waste in the Czech Republic (OECD classification; total production in 1992 = 187 million tons); A – municipal, B – energy production, C – industrial, D – other

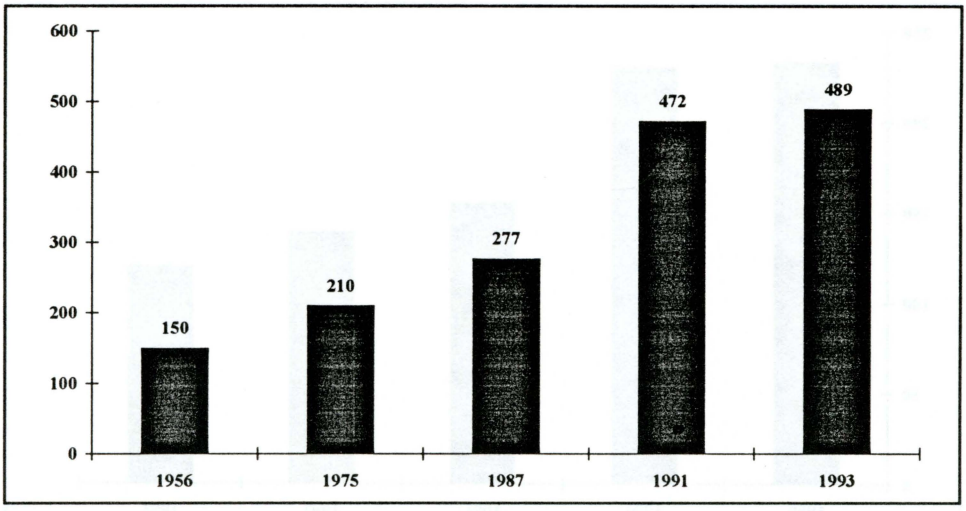

Fig. 6 – Production of Municipal Waste in the Czech Republic (kilograms per capita)

tal capacity of 1,225 MW were closed by the beginning of 1995 and this process continues. Altogether 1,504 MW will come to a halt.

Agricultural production has also declined as the industry did. The extent of arable land has been reduced by 2.5 %. This happened mostly in regions with unsuitable climate and poor soils. Some arable land, often of good quality, ceased to exist due to building activities around cities and towns. The use of nitrogenous and phosphoric fertilizers as well as pesticides has declined (Figure 4). These changes, however, can not be viewed as a consequence of planned activities aimed at reducing the environmental load. They were just passive results of cuts in state agricultural subsidies.

No improvements were recorded in the field of waste management (Figure 5). Recent analyses (Ministry of Environment, 1994; Braniš, M., Poncová, M., 1995) have proved that the total waste production does not tend to decrease. The amount of municipal waste has risen tremendously (Figure 6). The investigations of waste production, however, bring unreliable results: neither crude data nor data processing are accurate. (The legal definition of "waste" is vague and to some extent allows manipulation with data.) There were 1,511 dump sites in the Czech Republic in the beginning of 1995; only 280 of them met required standards. Less than 40 incinerators out of 210 conformed to the environmental laws.

Transportation also shows environmentally unfriendly trends. The amount of freight transported on railways has much decreased (Figure 7) and less coal is shipped on the Elbe. On the other hand the intensity and capacity of truck transport has increased. Instead of trains and buses, private cars are used more and more. The number of motor vehicles has been gradually increasing over the period 1991 – 1994 (Figure 8). On the contrary lead emissions have decreased by 75 % since more cars (ca. 8 % of all) have catalytic converters now. The content of lead in gasoline has been much reduced to just 0.15 g per litre. This figure is comparable to EU countries with the most strict standards (Germany, the Netherlands).[1)]

[1)] The same legal limit in France is 0.5 g and in UK 0.4 g per one litre of leaded gasoline.

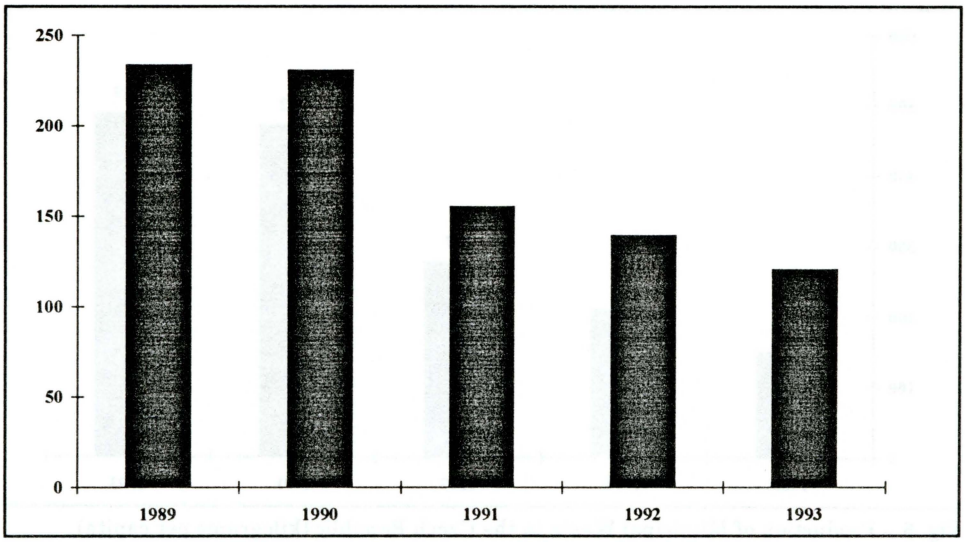

Fig. 7 – Railway Freight in the Czech Republic (million of tons per year)

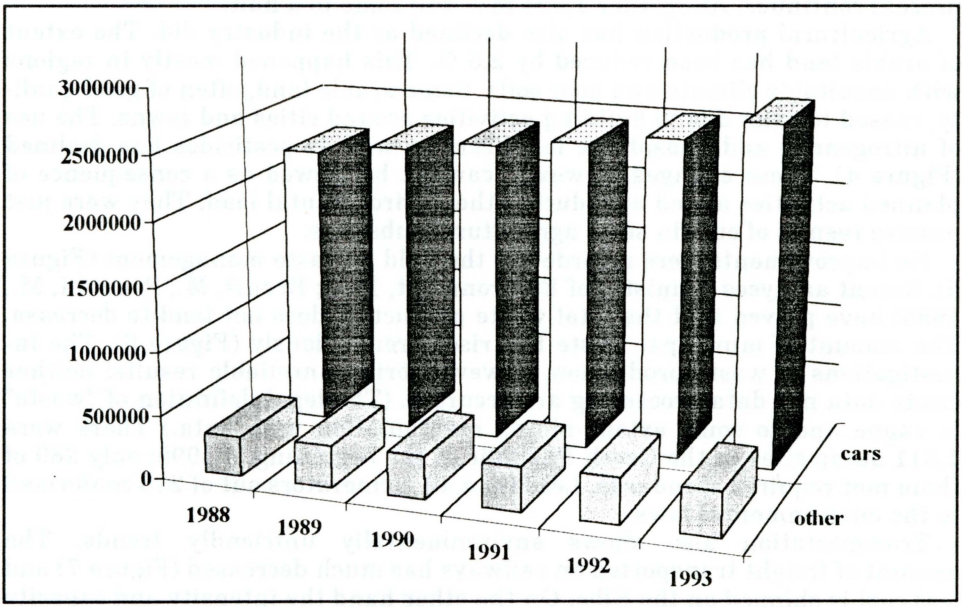

Fig. 8 – Number of Cars and Other Vehicles (vans, lorries, buses, and special vehicles) in the Czech Republic (in million); A – cars, B – other vehicles

The so-called old environmental loads remain a long-term problem that could hardly be found anywhere in Western Europe. The centrally planned economy, namely industry, had almost no legal limits and resulted in long-term environmental pollution and devastation. The former state-owned enterprises were often not forced to conform to the existing laws. As a result loads of toxic chemicals were depositied around factories and plants; the total

amount has not yet been specified. The presence of Russian occupation troops had similar consequences (especially as regards soil and underground water pollution) as had leaks from landfills. The uranium mining is a special case of an "old" environmental load: in order to obtain uranium ore different acids were injected underground and the uranium solution was subsequently pumped up. 4.4 million tons of sulphuric acid, nitrogenous acid and other chemicals penetrated into the Cenoman uranium strata close to Stráž pod Ralskem (North Bohemia) by 1993. This method of uranium extraction has later been reduced and finally terminated. The devastated area is estimated at ca 30 km^2 and 188 million m^3 of water is expected to be contaminated.

Decontamination that would remove the old environmental loads is estimated at 10 billions USD. The work will take ca 30 years; decontamination of the uranium district, however, will last 70-100 years. The Czech Government decided to stop the uranium mining by this drastic method on March 6, 1996.

3. Environmental Laws and Economic Tools

Passage and enforcement of environmental laws have much contributed to the environmental protection in the Czech Republic. Over 50 environmental laws and decrees of great importance have been approved since 1990! The fundamental law on the environmental protection has been passed and the outdated law on nature and landscape conservation has been thoroughly redone. Laws concerning waste management, air pollution, etc. were also enforced. The essential Environmental Impacts Assessment Act (EIA) has become part of the Czech environmental legal system. Though there are many imperfections in this Act (Braniš, M., Kružíková, E., 1994) it remains an invaluable tool that helps to protect nature, resources, and human health under the current conditons of a building boom and new technological processes.

Controversy, however, has ocurred recently within the Government and Parliament when implementation of more strict environmental standards was discussed. It reflects the clashes between the strong industrial lobby and hard-line environmentalists. Water protection (especially consumption of surface and underground water), forest management (conflict between the economic and non-economic functions of forests), and agricultural land (namely trends encouraging the conversion of agricultural land into building plots, industrial areas, and transportation lines) were among the hot topics. Industrial enterprises have also raised objections against the strict Air Pollution Law that imposes high penalties and fines for production of ozone-destructive chemicals and common harmful substances.

Many environmental laws include charges for releasing dangerous chemicals up to a legal limit and also fines and compensations if these limits are exceeded. Tax reliefs are still unsatisfactory (though some exist) and no taxes have been imposed so far on environmentally hazardous activities (i.e. carbon dioxide tax, energy consumption tax, etc.). Labelling of environmentally friendly products is a sort of economic tool, too, but it lacks better promotion.

4. Environmental Budget and Finances

It has been estimated that some 3.5 % of Czech GDP was spent on environmental protection and conservation in 1995 (detailed data are not yet avail-

Table 1 – Environmental Budget/Expenses in the Czech Republic (million CZK)

Year	State Budget	State Environmental Fund	Other sources	Total	% GDP
1990	3,300	1,400	1,300	6,000	1.0
1991	7,800	1,100	500	9,400	1.3
1992	10,800	1,500	4,600	16,900	2.1
1993	8,200	3,400	8,400	20,000	2.2
1994	8,300	3,600	16,400	28,300	2.7
1995	8,500	4,900	N.A.	N.A.	3.5

able). 8.5 billion CZK came from the state budget (Ministry of Environment, 1995); moreover the State Environmental Fund contributed a significant portion, too (Table 1).

The Fund is fed by charges for air pollution (818 million CZK in 1993; 1,587 million CZK in 1995!), waste water release, waste disposal, extraction of underground water, conversion of agricultural land, and extraction of raw materials. Fines imposed on excessive pollution also come to the Fund. The Fund received 4,960 million CZK in 1995 and almost all this money (nearly 4,900 million) was used to support ecological programmes. Both the state budget sources and Fund money are invested into preventive or corrective projects that include extending the natural gas network, sewage plants, drinking water supply, dumps and incinerators, trolley buses, fish programme, vegetation revitalization, research activities, etc. In 1995 the Fund spent 40 % more money than in 1994 and 73 % more compared with 1993 (State Environmental Fund, 1996).

Apart from the above mentioned financial sources environmental projects were also backed by large sums of private money. These were mainly used for direct ecological investments in industrial businesses such as desulphurization, dust reducing programmes, etc. Reduction of the old environmental loads was in case of privatized companies partly financed by the National Property Fund (NPF). The NPF environmental money amounted to 2 billion CZK in 1995. The PHARE subsidies should also be mentioned. PHARE money (ca. 25 million ECU), however, could not be spent on direct investments. This should be changed in the future (Ministry of Environment, 1995).

Measured by the share of GDP the amount of money invested in environmental protection in the Czech Republic seems to be much higher than in other European countries (in 1995 this share was twice as high as in the UK, Germany, and Switzerland). Nevertheless, Czech environmental expenditures should not be cut. The seemingly high share on GDP is counterbalanced by the actual necessity of high environmental investments. Such needs do not exist in EU countries that have been investing into environmental protection ca. 1.5 % of GDP over many decades. The estimated costs for cleaning up the Czech Republic amount to ca 400 billion CZK and it would take 20-30 years. This process, however, should be by no means paid for by state money only. Private firms are expected to contribute a lot and gradual implementation of preventive arrangements should bring results, too. The state money saved could be spent on reducing the "old environmental loads", on reducing the devastating production of uranium ore and coal, and also on implementing environmentally friendly technological processes.

5. Social Responses

A number of environmental groups exists in the Czech Republic. Apart from well-known international ones – e.g. Greenpeace – there are also domestic groups. Some were already active under Communism, others came into existence soon after the political change of 1989. Dozens of environmental educational centres that now play an important role in raising the public awareness have emerged suddenly after 1989. Ecological and environmental issues gradually have become part of education at all levels. Environmental courses are currently lectured at most universities that provide training in natural, technical, social, and medical sciences. A number of environmental textbooks and other sources of knowledge is available. In spite of some imperfections the above mentioned facts must be treated as a real success. Only two university institutes provided environmental courses before 1989 (Braniš, M., 1993). Environmental issues at primary and secondary schools received either very little or no attention at all. Today, environmental knowledge now is part of many existing subjects or even new courses (Braniš, M., 1995). However, nothing like a unified system of environmental education that would include syllabi, methodical suggestions, legal and institutional framework exists in the Czech Republic so far.

One can observe a similar "green boom" also in public media although environmental information is sometimes presented in an unreliable way. The Ministry of Environment should devote more attention to raising the public awareness. This kind of environmental "education" enjoys less interest at the moment than it did between 1989 and 1992.

The current public availability of environmental information and data differs much from the situation under Communism. The Ministry of Environment runs several monitoring systems (air, water, etc.). Data are processed at a regular base, published, and available to everyone. Environmental Yearbooks are released in Czech and English. The 1993/1994 Yearbook already includes OECD and EU standards and criteria and can be used for international comparisons.

6. Conclusions

The early 1990 opinion polls revealed that the devastated environment belonged among the most pressing problems. 83 % of questioned Czech citizens in 1990 perceived environmental issues as "one of problems to be discussed by the Government as early as possible" (Moldan, B., 1990). Six years later most of the public interest is devoted to financial affairs, safety, and public security; environment is not any more number one problem. The first post-1989 environmental ministers and their staffs successfully raised the public awareness and general interest in environmental problems. Though the current Ministry is often criticized for being weak and having given up environmental concepts in favour of the free market ideas, the Ministry remains an integrated part of the Establishment. This fact should be treated as a positive one even if it is true mainly due to the systematic conceptual, legal, and public activities of the former Federal Committee for Environment and the Czech Ministry of Environment (1990 – 1992).

The Czech Government approved the State Environmental Policy on August 23, 1995 (Ministry of Environment, 1995). This date might be treated as a turning point in the first phase of implementing environmental concepts

into the society. It also is a result of social stabilization after the post-1989 transition. The proclamation does not include the concept of sustainable development and the relations between economic, energy, and health policies on the one hand and the environmental policy on the other hand is not mentioned. As such it does not fit ideas of hard line environmentalists. Given the fact, however, that the proclamation was approved under conditions of strong pressure from technocratic and market-oriented lobby interested in exploitation of natural sources at any price, it is a success.

References:

BRADÁČ, J., UNZEITIG, M. (1993): Současný stav sanačních prací na uranovém ložisku Stráž pod Ralskem. In: Reichmann, F. (ed.): Přehled ekologicky zaměřených geologických výzkumných prací v roce 1993. Ministerstvo životního prostředí, Praha, 60 p.

BRANIŠ, M. (1993): Environmental Management Curriculum – an Example from the Charles University. In: Environmental Science and Management Studies Yearbook '93 .VIDE Publishers, Riga, 298 p.

BRANIŠ, M. (1995): Jak dál v ekologické výchově. Geografické rozhledy, 4, No. 4, Praha, pp. 113-114.

BRANIŠ, M., KRUŽÍKOVÁ, E. (1994): The Environmental Impact Assessment Act in the Czech Republic: Origins, Introduction and Implementation Issues. Environ. Impact Assess. Rev. 14, No. 2, pp. 193-199.

BRANIŠ, M., PONCOVÁ, M. (1995): Produkce komunálních odpadů v České republice (manuscript).

MOLDAN, B. (ed.) et al. (1983): Analýza stavu životního prostředí v ČSSR. Ekologická sekce Československé biologické společnosti při ČSAV (manuscript).

MOLDAN, B. (ed.) (1990): Environment of the Czech Republic, Parts I., II., III. Academia, Praha.

MŽP (1994): Environmental Year-book of Czech Republic. Czech Environmental Institute, Praha, 240 p.

MŽP (1995): State Environmental Policy (document approved by the government of the Czech Republic on August 23, 1995). Official authorised version of the Ministry of Environment of the Czech Republic.

SFŽP (1996): Hospodaření SFŽP v roce 1995. Informační bulletin SFŽP. Vol. II, No.5, March 1996.

VAVROUŠEK, J., MOLDAN, B. (1989): Stav a vývoj životního prostředí v Československu. Ekologická sekce Československé biologické společnosti při ČSAV, 146 p.

Shrnutí

STAV A VÝVOJ ŽIVOTNÍHO PROSTŘEDÍ ČESKÉ REPUBLIKY V OBDOBÍ EKONOMICKÉ A POLITICKÉ TRANSFORMACE

Rok 1989 byl v ČR významným předělem nejen pro sféru politickou a hospodářskou, ale také pro oblast zahrnující ochranu životního prostředí. Stav životního prostředí ČR na přelomu 80. a 90. let byl totiž v evropských měřítkách hodnocen jako katastrofální a občané žádali rychlou kvalitativní změnu. Nadměrná těžba energetického uhlí (v letech 1984 až 1987 dosahovalo množství vytěženého uhlí téměř 100 mil. t/rok, obr. 1), těžba surovin, následné znečištění ovzduší a vody i postupující degradace půdy těžkou technikou a nadměrným používáním strojených hnojiv pro zvýšení fertility málo úrodné půdy v podhorských oblastech překračovaly meze nosné kapacity prostředí. Do spojitosti se špatným prostředím byl také dáván neuspokojivý zdravotní stav populace, především v těžařských a průmyslových regionech. Hlavním úkolem tehdejší státní administrativy však nebyly další analýzy stavu prostředí, ale spíše příprava a realizace potřebného legislativního a institucionálního rámce pro ochranu životního prostředí.

V první fázi politické a ekonomické transformace bylo zlepšování stavu dosaženo spíše pasivními cestami. Snížení průmyslové produkce, těžby hnědého energetického uhlí, stavebního kamene, útlum těžby uranu a pokles výroby polotovarů těžkého průmyslu znamenaly výrazné snížení emisí škodlivých látek do ovzduší, vody i horninového prostředí. Následkem omezení dotací do zemědělství se také výrazně snížila spotřeba dusíkatých a fosforečných hnojiv i pesticidů.

Zlepšení stavu prostředí však není možno zaznamenat v oblasti produkce odpadů. Celková produkce odpadů od roku 1987 neklesla. Enormní vzrůst je patrný především u komunálního odpadu. K 1.1. 1995 bylo na území České republiky 1511 skládek, z nichž pouze 280 vyhovělo daným předpisům. Z 210 spaloven odpadů necelých 40 splňovalo emisní limity dané zákonem. Environmentálně nepříznivá situace se vyvíjí i v sektoru dopravy. Výrazně poklesl objem i tonáž dopravovaného nákladu na železnici, byla omezena doprava energetického uhlí po Labi a zvýšila se nákladní automobilová doprava. Postupně je zaznamenáván stálý nárůst soukromé automobilové dopravy, především na úkor železnice a autobusů.

Stálým a dlouhodobým problémem jsou tzv. staré ekologické zátěže. Jedná se o dlouhodobé poškozování prostředí centrálně plánovanou a velmi málo omezovanou průmyslovou výrobou (dříve platné zákony nemusely mnohdy státní podniky vůbec respektovat). Podobný dopad na prostředí (především půdu, a podzemní rezervoáry vody) měla i přítomnost sovětských okupačních armád, průsaky z nezajištěných a mnohdy nekontrolovaných skládek smíšeného odpadu a také těžba uranu pomocí vtláčení kyselin do podzemí. Do roku 1993, kdy bylo vtláčení výrazně omezeno a následně i zastaveno, bylo v oblasti Stráže pod Ralskem vpraveno do cenomanského ložiska uranu asi 4,4 mil. tun kyseliny sírové, dusičné a dalších chemikálií. V současné době je odhadována plocha postiženého rezervoáru na 30 km^2 a množství kontaminované vody na 188 mil. m^3.

Zásadním prvkem cílených změn kvality prostředí byla příprava a uplatňování řady nových vyhlášek a zákonů. Od roku 1990 bylo postupně uvedeno do praxe více než 50 (!) nových zákonů a vyhlášek zásadního dosahu. Byla připravena základní právní norma o ochraně životního prostředí, zcela byl přepracován již nevyhovující zákon o ochraně přírody a krajiny. V účinnost vešly i zákony o odpadech, ochraně ovzduší a další. Od roku 1992 obsahuje česká environmentální legistativa i zásadní zákon o posuzování vlivů na životní prostředí – EIA. Uplatňování těchto zákonů je možno považovat za hlavní tlak na potenciální znečišťovatele životního prostředí.

Zlepšení stavu prostředí lze také přičíst poměrně značnému objemu financí, které jsou do této sféry vkládány. Na ochranu životního prostředí věnovala Česká republika v roce 1995 okolo 3,5 % hrubého národního produktu. Kromě státního rozpočtu, který na sféru ochrany životního prostředí přispíval v roce 1995 celkovou částkou 8 500 mil. Kč, byl dalším hlavním zdrojem Státní fond životního prostředí (celkem 4 960 mil. Kč).

I přes některé přetrvávající problémy je možno označit období prvních 5 let existence svobodného státu (ČSFR a pak ČR) za období zlepšení stavu prostředí, příslušné legislativy i respektu k institucím zabývajících se ochranou životního prostředí. Významným mezníkem pak bylo přijetí oficiální státní ekologické politiky na sklonku roku 1995.

Obr. 1 – Produkce uhlí v České republice. Osa x – roky, osa y – produkce v mil. tun; 1 – hnědé uhlí, 2 – černé uhlí
Obr. 2 – Celkové emise hlavních atmosférických polutantů v České republice (v tis. t za rok)
Obr. 3 – Spotřeba freonů 11, 12, 113 a 115 v České republice (v tunách)
Obr. 4 – Trendy ve využívání hlavních druhů hnojiv v České republice (v kg na ha)
Obr. 5 – Produkce odpadů v České republice podle klasifikace OECD (v roce 1992 celkem 187 mil. t); A – komunální, B – z výroby energie, C – průmyslové, D – zemědělské, E – ostatní
Obr. 6 – Produkce komunálních odpadů v České republice (kg na obyvatele)
Obr. 7 – Železniční doprava v České republice (v mil. tun za rok)
Obr. 8 – Počet osobních automobilů ve srovnání s ostatními druhy vozidel (nákladní automobily, mikrobusy, autobusy, speciální vozidla) v České republice (v milionech); A – osobní automobily, B – ostatní druhy vozidel

(Author is with Institut for Environmental Studies, Faculty of Science, Charles University, Benátská 2, 128 01 Praha 2.)

Arrived to the editor's office on March 14, 1996
Recommended for publication by Zdeněk Lipský and Václav Přibyl

GEOGRAFIE – SBORNÍK ČESKÉ GEOGRAFICKÉ SPOLEČNOSTI
ROK 1996 • ČÍSLO 2 • ROČNÍK 101

MARTIN ČIHAŘ

NATURE CONSERVATION AND LANDSCAPE PROTECTION IN THE CZECH REPUBLIC

M. Čihař: *Nature Conservation and Landscape Protection in the Czech Republic.* – Geografie-Sborník ČGS, 101, 2, pp. 180 – 189 (1996). – The article deals with the historical aspects and current trends in nature conservation and landscape protection in the Czech Republic. The internal structure of this branch is described as are some societal and economic contexts. The legal framework of environmental protection and basic legal terms are mentioned. The current trends are shown on four sub-branches: protection of species, protection of dispersed greenery, regional protection, and geological protection. The analysis of concrete data allows to judge the state environmental policy and its negative and positive impacts on the nature conservation and landscape protection.
KEY WORDS: nature conservation and landscape protection – environmental legislation – historical aspects and current state of the environmental policy.

1. Introduction

The nature conservation and landscape protection in the Czech Republic are integral parts of the environmental sphere. This branch is a specific one and in many aspects stands close to the geographical perception of the reality. As such it undoubtly deserves attention.

The current legislation defines the protection of nature and landscape as "the care of wild animals, plants, and habitats, of minerals and rocks, palaeontological finds, geological units, the care of ecosystems and landscape features as well as the care of accessibility and aesthetic aspects of the landscape. This care is provided by the state, individuals, and companies." Conservation and environmental efforts mostly focus on the natural balance, on the reconstruction of biological diversity, natural features and beauties, and on the reasonable management of natural resources.

2. History and Present

Some historical data will be mentioned first.

The *Maiestas Carolina* decree, issued by the Czech King and Roman Emperor Charles IV, is probably the earliest written document that deals with environmental issues. It came into existence in the 14th century and concerned the forest management and protection. Hojná Voda and Žofínský prales, two virgin forests, were proclaimed nature reserves – among the first in Central Europe – by the far-seeing Count of Buquoy as early as 1838. Later, some more protected areas came into existence in Bohemia and Moravia under the Austro-Hungarian Empire. There were also associations focused on nature protection and raising the public awareness.

Things changed after 1918 when the independent Czechoslovak Republic emerged. Nature protection was institutionalized. Mr. Rudolf Maximovič became the head of Czechoslovak nature protection. 142 protected areas were proclaimed by 1939. The Act No. 40 of 1956 was the result of long-time efforts: it first officially sanctioned the responsibility of state for nature protection. The first large-scale protected area (Český ráj; 125 km^2) had been proclaimed one year earlier. The first Czech National Park (Krkonoše; 385 km^2) came to existence in 1963.

The Czechoslovakia of that time, however, has been since 1948 part of the Soviet sphere. The Soviet dominance has influenced all fields of human activity including the environmental protection. Though many new protected area have been proclaimed (see further text), the above mentioned No. 40 Act was approved and environmemtnal protection received the institutional framework, the disperities between oral proclamations and actual state of the art of the environment became more and more apparent. Real environmental data, however, could be publicized only after the political changes of 1989. Most of them were rather unpleasant. It became publicly known that 80 % of the Czech Republic suffered from degradation of all environmental components, including the natural environment (Figure 1). Most of dispersed greenery in agricultural regions has vanished and over one half of all forests was damaged by airborne pollution (Moldan, B. et al., 1990). The biological diversity has been much reduced in whole Czechoslovakia. Some 50 % of fish ranked among endangered species; the same was true with 72 % amphibians, 77 % of reptiles, 62 % of birds, and 65 % of mammals (Juláková, J. et al., 1991). Reparation of such a damage, of course, will take a long time – maybe generations.

The period of environmental enthusiasm lasted two years. Most of the environmental laws that are still effective were enacted during that time. The Czech Ministry of Environment and other important bodies were established, new environmental projects were launched, two National Parks plus four

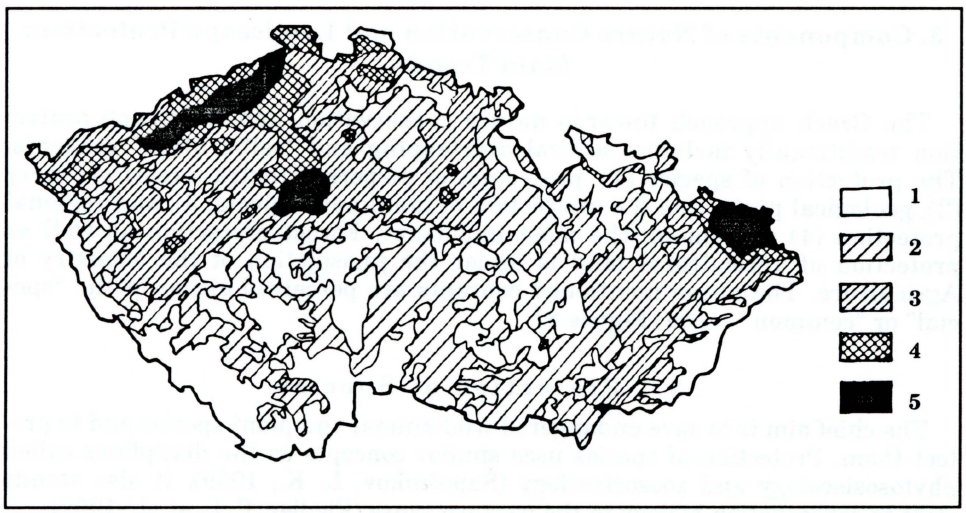

Fig. 1 – Quality of environment (Moldan, B. et al., 1990). Evaluation of the quality: 1 – high (class I), 2 – acceptable (class II), 3 – disturbed (class III), 4 – strongly disturbed (class IV), 5 – extremly disturbed (class V)

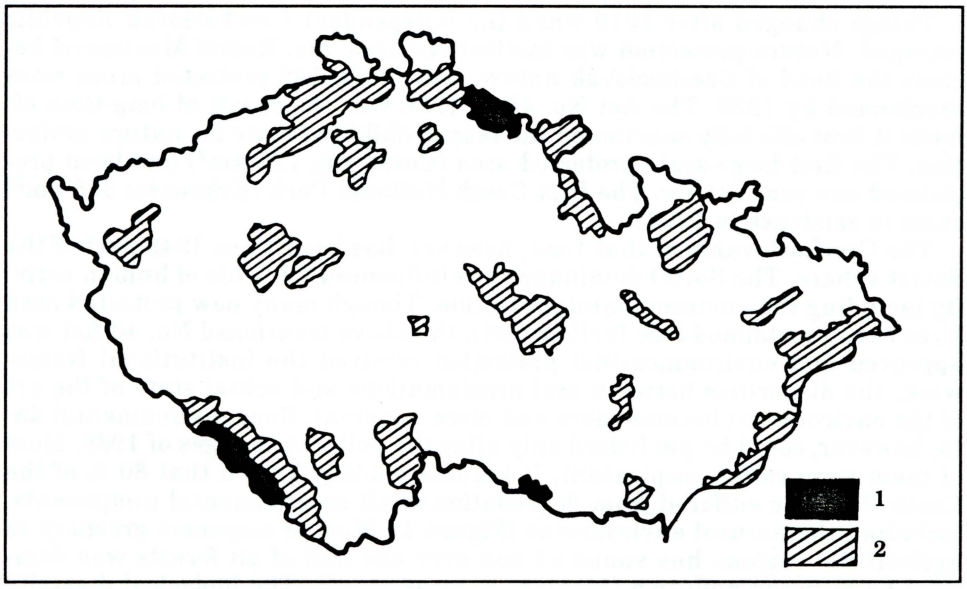

Fig. 2 – National Parks and Protected Landscape Areas in the Czech Republic: 1 – National Parks, 2 – Protected Landscape Areas

Protected Landscape Areas were proclaimed. Czechoslovakia became a member of world and European environmental organizations and signed international environmental conventions.

Environmentally less friendly trends, however, were gradually becoming apparent. Their character is defined by the unbalanced stress put on the economic aspects of transition and on the concept of sustainable development.

3. Components of Nature Conservation and Landscape Protection: Main Trends

The Czech approach towards nature conservation and landscape protection traditionally includes several overlapping and "self-centred" concepts. The protection of species (1), protection of dispersed (extra-forest) greenery (2), geological protection (i.e. protection of inanimate objects; 3), and regional protection (4) are among the most important. Forest protection as well as protection of agricultural land is under the jurisdiction of the Ministry of Agriculture. The above mentioned concepts are perceived either in the "special" or "common" sense (Figure 3).

3.1 Protection of Species

The chief aim is to save endangered wild animal and plant species and to protect them. Protection of species uses similar concepts as the disciplines called phytososiecology and zoososiecology (Šapošnikov, L. K., 1969). It also stands close to conservation biology in the western sense (Fiedler, P. L. et al., 1992).

The number of animal species in former Czechoslovakia has been estimated at 41,000 (99 % are invertebrates). There are some 3,000 of multicellular plants.

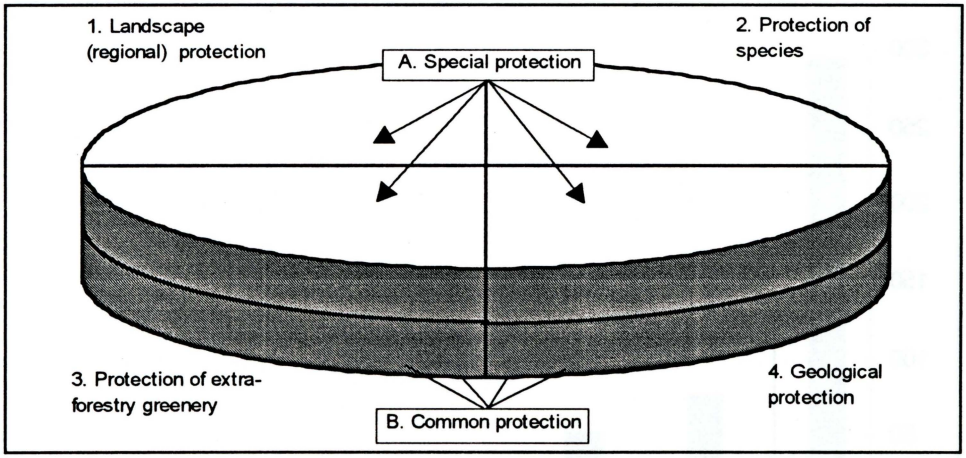

Fig. 3 – Nature protection in the Czech Republic: A – special protection, B – common protection; 1 – landscape (regional) protection, 2 – protection of species, 3 – protection of extraforestry greenery, 4 – geological protection

The biological diversity has been much reduced in Bohemia and Moravia mainly due to degradation and destruction of habitats, excessive exploitation of some wild plants and animals, introduction of alien species, and to some extent also due to extinction by purpose. Among the systemic measures taken by the bodies concerned with protection of species have been the so-called Red Books and Red Lists, appropriate legislation, cooperation with regional conservation bodies (see further text) and also special conservational tools such as rescue programmes, species reintroduction, habitat reconstruction, etc. It also includes growing and breeding of endangered species *ex situ*, and – last but not least – purposive ecological education (Čeřovský, J. et al., 1988).

At the moment the "Red List" includes an overwhelming majority of all endangered species in the Czech Republic. Three Red Books out of five planned have already been published (Sedláček, K. et al., 1988, Baruš, V. et al. 1989, Škapec, L. et al., 1992). The Red Book of non-flowering plants will soon be released in Slovakia; the volume dealing with flowering plants, however, is still missing.

There has been a lot of progress in the legislative field recently. The out-of-date laws were replaced by new ones. This was the case of Act No. 40/1956 on the state environmental protection and related regulationes that were substituted by the Act No. 114/1992 (nature conservation and landscape protection) and by the Czechoslovak Ministry of Environment Regulation No. 395/1992. The latter lists among others also all specifically protected plant and animal species. As regards the quantity, there is a clear progress in terms of numbers: 526 plant species are legally protected now instead of previous 108; 293 animal species instead of 174. The so-called general protection of species became part of the legislative system: all wild plants and animals are automatically protected unless a legal exception is made. The category of "specifically protected species" has replaced "protected species". Species are grouped into three subcategories according to the level of endangerment (endangered, specially endangered, and critically endangered species). The protection of species should be more closely linked to the regional protection and both should become more effective.

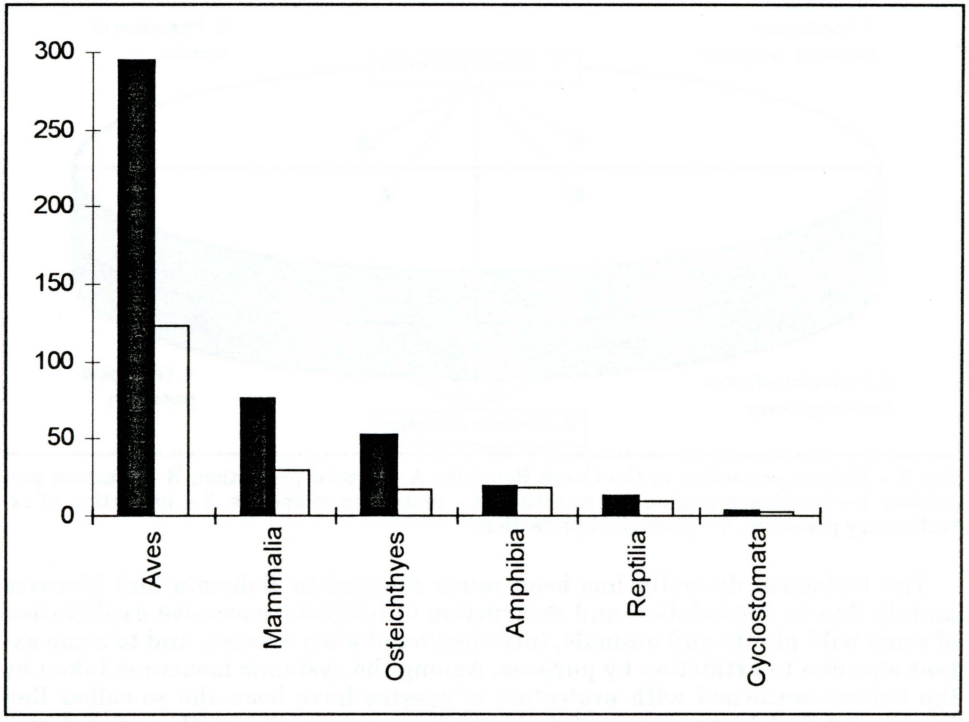

Fig. 4 – Number of Czech and Slovak vertebrates and number of endangered vertebrates (Czech Ministry of Environment Decree No. 395/1992). 1 – total number, 2 – number of enagered species

Let us mention some successful programmes managed by the species protection bodies. These include protection of oligotrophic river courses and the populations of pearl-oyster *(Margaritifera margaritifera)*, and *Formica* programmes. Several animals have been reintroduced: beavers *(Castor fiber)* in Central Moravia, lynx *(Lynx lynx)* in the Šumava Mts., and eagle *(Heliaetus albicilla)* in South Bohemia.

3.2 Protection of Dispersed Greenery

Dispersed (extra-forest) greenery includes all autotrophic plants, namely trees and shrubs that grow outside forests. A long-time and well-founded tradition of dispersed greenery protection in the Czech Republic exists: the Czech landscape has been intensively exploited over centuries and man-induced hazards are high. However, 240,000 hectares of grassy field boundaries, 20 % of meadows and pastures, 4,000 km of ribbon greenery, and 3,600 hectares of dispersed greenery have disappeared from the agricultural regions over the past few decades. This has happened mostly due to the amalgamation of fields and other "rationalizing" measures taken by the socialist agricultural policy. The old Act No. 40/1956 was too weak to reverse these trends; moreover it was most probably not intended to do so. The Regulation No. 142/1980 (concerning "details of protection of trees growing outside forests") could bring a partial help only. It had to be corrected by the Czech Ministry of Culture short time later by a special recommendation.

The current legislation concerning the protection of dispersed greenery is based on the obligatory protection and care of trees by all landowners. Clearance is prohibited unless a precisely defined exception is issued. A new category of "monumental trees" came into existence. These trees are officially recorded by conservational bodies and their protection zone is defined.

The protection of dispersed greenery should be separated neither from the protection of species nor from the regional protection (see further text). Among the species enjoying special protection are for instance the critically endangered mountain ash *(Sorbus sudetica)*, five types of willows (*Salix* sp.), and the almond tree *(Amygdalus nana)*.

3.3 Geological Protection

The Czech Republic has extremely varied geological and geomorphological conditions. The country is bisected by the boundary separating old Hercynian formations from the more recent Alpine structures. In more detailed terms this line divides the Czech Massif from the Carpathian Mountains. The complicated natural history has resulted in a remarkable diversity of rock types as well as in a diversity of surface and underground formations. The central part of the Czech Massif is the oldest region within the Czech Hercynian area. It contains the Moldanubicum and the Barrandien-Iron Mountains Zone internationally known for rich fossils finds. The latter has been named after Joachim Barrande, French geologist who thoroughly researched this area in the 19th century. The international boundary between Silurian and Devonian rocks has been determined there.

Geological protection has naturally much to do with the regional environmental protection. Most valuable parts of the inanimate nature enjoy legal protection. Various degrees of protection exist within the whole network of such protected areas. Under the old legislative system these small-scale areas were called Protected Natural Elements. At the time being there are Natural Monuments and National Natural Monuments (see further text).

Geological protection in the Czech Republic has two basic levels. First, it is the above mentioned network of protected areas focused on the inanimate nature. Second, the permanent and complex care of inorganic structures is also important. Especially the latter is much determined by the quality of environmental legislation and standards and also by some efforts that are often contradictory to environmental concerns (Mining Act No. 44/1988, etc.).

Though the general geological protection lacked precise standards in the past, at the present time there are two groups of inorganic structures that are legally protected everywhere with no exceptions. These include all palaeontological finds and natural caves and underground hollows. As regards the specialized geological protection (Act No. 114.1992), a list of protected minerals is expected to be compiled. Such a list would be an analogy to the specially protected animal and plant species (see Protection of Species); however, it has not been published so far. There are even no signs of preraratory works.

3.4 Regional Protection

As noted above the regional protection of nature and landscape needs to be complex, effective, and the system must make sense. The traditions of Czech regional environmental protection have been also already mentioned. By Central European standards the current state of regional environmental pro-

Table 1 – National Parks (NP) and Protected Landscape Areas (PLO) in the Czech Republic

Name of area	IUCN management category	Status	Area (ha)	Year notified
Český ráj	V	PLA	8646	1955
Moravský kras	V	PLA	8545	1956
Krkonoše	V	NP	36300	1963
Šumava	V	PLA	99752	1963
Jizerské hory	V	PLA	35002	1967
Jeseníky	V	PLA	73689	1969
Orlické hory	V	PLA	20410	1969
Žďárské vrchy	V	PLA	70881	1970
Český kras	V	PLA	12458	1972
Labské pískovce	V	PLA	32474	1972
Beskydy	V	PLA	117319	1973
Slavkovský les	V	PLA	61896	1974
Kokořínsko	V	PLA	26726	1976
Křivoklátsko	V	PLA	63346	1978
Podyjí	V	PLA	10300	1978
Třeboňsko	V	PLA	70695	1979
Bílé Karpaty	V	PLA	71291	1980
Blaník	V	PLA	4057	1981
Blanský les	V	PLA	21235	1989
Litovelské Pomoraví	V	PLA	9600	1990
Broumovsko	V	PLA	41000	1991
Podyjí*)	II	NP	6300	1991
Poodří	V	PLA	8150	1991
Šumava*)	II	NP	68520	1991
Železné hory	V	PLA	38000	1991
total			1016592	
average			40663,7	1976,36

*) inside PLA area

tection in the Czech Republic can be judged as an average or under-average one though some quantitative data show high values (Čihař, M., 1995 a, b). One has to keep in mind, however, the vast devastation of the natural and living environment (Figure 1). The effects of current rapid economic development and the consequences of land privatization have been so far often negative. Many protected areas are under threat of the mining activities (Protected Landscape Areas České Středohoří and Český ráj). In most protected areas there are actual or potential conflicts with recreational functions.

The new legislation has brought several new aspects into the regional environmental protection. First, the concept and tools of general regional protection of nature have been defined; second, the existing network of specially protected areas (so-called special regional protection of nature) has been restructured and rules have been clarified.

The Regional Ecological Stability Systems (RESS; Czech analogy to the West European ECONET – Míchal, I. et al., 1991) became effective tools of the general regional protection. In the future REBSs are expected to become

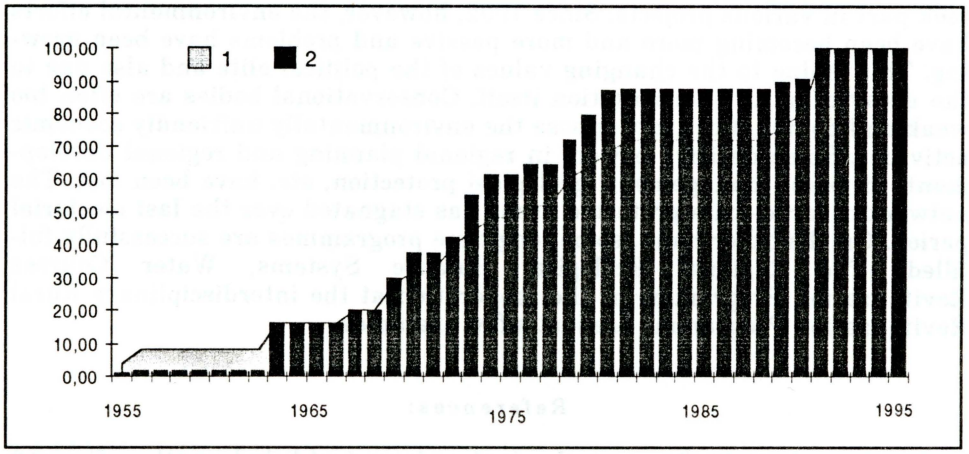

Fig. 5 – Relative number and area of National Parks and Protected Landscape Areas; axis x – year notified, axis y – % of actually value; 1 – number, 2 – area

an obligatory part of all planning documents at all levels. The system of "Important Landscape Components" (ILC) also enjoys legal protection. ILCs are either protected automatically on the basis of the Nature and Landscape Protection Act (forests, bogs, water courses, etc.) or are registered by the respective conservational bodies. The latter case includes the "landscape character", natural parks, and temporary protected areas.

The legal tools in the field of general regional protection are appropriately complemented by some complex and long-termed environmental projects such as the Water Courses Revitalization Programme or Rural Revitalization Programme. These projects are mostly backed by the state and by the State Environmental Fund.

There have also been changes in the field of special regional protection. Eight categories of protected areas existed in the past (National Parks, Protected Landscape Areas, State Natural Reserves, Protected Finding Places, Protected Parks and Gardens, Protected Scientific Areas, Protected Natural Features, and Protected Natural Monuments). These have been substituted by a simplified system consisting of six types of so-called specially protected areas. National Parks and Protected Landscape Areas have survived as typical large-scale protected areas (Table 1, Figure 5). Apart from these there are four types of small-scale protected areas in the time being: National Natural Reserves (113), Natural Reserves (99), National Natural Monuments (454), and Natural Monuments (988). In spite of large numbers, the total extent of small-scale protected areas makes up less than 1 % of the Czech Republic.

4. Conclusions

The Czech nature conservation and landscape protection won a number of important victories soon after the political change of 1989. New environmental bodies were created, many environmental laws became effective, two Natural Parks were proclaimed, the Czech Republic became a member of important international organizations, signed international conventions and

took part in various projects. Since 1992, however, the environmental efforts have been becoming more and more passive and problems have been growing. This is due to the changing values of the political elite and also due to the decay of nature conservation itself. Conservational bodies are often too weak and do not effectively oppose the environmentally unfriendly economic activities. Some decisive powers in regional planning and regional development, in forest management, geological protection, etc. have been lost. The network of large-scale protected areas has stagnated over the last electorial period. On the other hand, some long-time programmes are successfully fulfilled. The Regional Ecological Balance Systems, Water Courses Revitalization Programme or the cooperation at the interdisciplinary Rural Revitalization Programme are just a few examples.

References:

BARUŠ, V. et al. (1989): Červená kniha ohrožených a vzácných druhů rostlin a živočichů ČSSR, 2. SZN, Praha, 133 p.

ČEŘOVSKÝ, J. et al. (1988): Rukověť ochránce přírody, 3., SZN, Praha, 400 p.

ČIHAŘ, M. (1995): Speciální územní ochrana přírody v Evropě a v České republice I. Planeta, 3, No. 9/10, pp. 41-45.

ČIHAŘ, M. (1995): Speciální územní ochrana přírody v Evropě a v České republice II. Planeta, 3, No. 11/12, pp. 48-52.

FIEDLER, P. L. et al. (1992): Conservation Biology. Chapman and Hall, New York and London, 507 p.

JULÁKOVÁ, J. et al. (1991): Zpráva o stavu životního prostředí v ČSFR. FVŽP, Vesmír, Praha, 123 p.

MOLDAN, B. et al. (1990): Životní prostředí České republiky. Academia, Praha, 281 p.

MÍCHAL, I., et.al. (1991): Územní zabezpečování ekologické stability, teorie a praxe. Ministerstvo životního prostředí ČR, 150 p.

SEDLÁČEK, K. et al. (1988): Červená kniha ohrožených a vzácných druhů rostlin a živočichů ČSSR, 1. SZN, Praha, 177 p.

ŠAPOŠNIKOV, L. K. (1969): Zapovjedniki i nacionalnyje parki mira. Nauka, Moskva, 238 p.

ŠKAPEC, L. et al. (1992): Červená kniha ohrožených a vzácných druhů rostlin a živočichů ČSFR, 3. Príroda, Bratislava, 155 p.

Shrnutí

OCHRANA PŘÍRODY A KRAJINY V ČESKÉ REPUBLICE

Ochrana přírody a krajiny má v České republice mnohaletou tradici. Po metodologické, odborné i legislativní stránce patří k dobře zajištěným součástem environmentální sféry. Mnohé ukazatele a charakteristiky jejího aktuálního stavu odpovídají standardům aplikovaným ve státech západní Evropy, v řadě případů se blíží požadavkům trvale udržitelného rozvoje.

V důsledku zásadních politicko-hospodářských přeměn po druhé světové válce a pak na přelomu osmdesátých a devadesátých let (pád „železné opony" mezi Východem a Západem) docházelo a dochází k významným pnutím mezi potřebami hospodářského rozvoje a prioritami citlivého přístupu k přírodě a krajině. To se muselo nutně projevit na kvalitě celkové environmentální situace státu, ochranu přírody a krajiny nevyjímaje (Moldan, B. et al., 1990).

K nesporným pozitivům posledních několika let patří vlastní etablování environmentálního rezortu, jehož je dnes ochrana přírody a krajiny nedílnou částí. Dále připomeňme přijetí progresivních legislativních norem, uskutečňování celoplošných programů tzv. územních systémů ekologické stability, revitalizace říčních toků, program „obnovy vesnice", péče o krajinu nebo řadu drobnějších a vesměs lokálně nebo regionálně úspěšných projektů na

ochranu a rozvoj biologické diverzity. Z širšího pohledu jsou pro českou ochranu přírody velkým pozitivem veškerá zlepšení, vykazovaná v ostatních složkách životního prostředí, například v ochraně ovzduší, ochraně podzemních a povrchových vod nebo v odpadovém hospodářství.

Kriticky lze hodnotit liknavost, nepružnost a nedůslednost některých přijímaných opatření a postupů na nejrůznějších správních úrovních, podobně tak i omezenou schopnost kompetentních orgánů a struktur při jejich prosazování. Bolestná byla zejména ztráta některých klíčových kompetencí (např. územní plán). Právě ve složitých transformačních podmínkách mohou taková "zaváhání" přinášet negativní a často nezvratný efekt.

Obr. 1 – Kvalita životního prostředí (Moldan, B. a kol., 1990). Životní prostředí: 1 – vysoké kvality (třída I), 2 – přijatelné kvality (třída II), 3 – porušené (třída III), 4 – silně porušené (třída IV), 5 – extrémně porušené

Obr. 2 – Národní parky a chráněné krajinné oblasti v České republice: 1 – národní parky, 2 – chráněné krajinné oblasti

Obr. 3 – Ochrana přírody v České republice: A – speciální ochrana, B – obecná ochrana; 1 – ochrana území, 2 – druhová ochrana, 3 – ochrana mimolesní zeleně, 4 – geologická ochrana

Obr. 4 – Počty taxonů českých a slovenských obratlovců a počty zvláště chráněných taxonů obratlovců podle vyhlášky MŽP ČR č. 395/1992 Sb. 1 – celkový počet, 2 – počet zvláště chráněných druhů

Obr. 5 – Relativní počty a relativní rozlohy velkoplošných chráněných území v České republice; osa x – roky, osa y – hodnoty v %; 1 – počet, 2 – rozloha

(Author is with Institut for Environmental Studies, Faculty of Science, Charles University, Benátská 2, 128 01 Praha 2.)

Arrived to the editor's office on March 14, 1996
Recommended for publication by Zdeněk Lipský and Václav Přibyl

Foreign Cooperation of Czech Geographical Departments

Department of Social Geography and Regional Development, Faculty of Science, Charles University, Prague is the most numerous of all geographical departments and institutes in Czechia. Seven academics – former members of the Geographical Institute at the Czech Academy of Science – reinforced the departmental staff in 1992. This enlargement allowed to extend and intensify geographical courses and research activities as well as to extend international contacts.

The current international cooperation consists of traditional and new contacts. There is a long-time collaboration with the Warsaw University (Poland). As many as eleven Polish-Czech Geographical Colloquia have already been organized; the last one was held in 1995. The ongoing joint research projects on recreation and second housing in the hinterland of big cities have been started more than ten years ago. Various aspects of social and economic transition in both countries are also studied. Collaboration with the Universities in Lodz and Wroclaw, and with the PAN Geographical Institute is based on regular exchange of lecturers and scientists.

Traditional contacts with some Russian institutes have been recently revived. This is the case of Lomonosov University, Moscow, and University of Sankt Petersburg. Exchange of small students groups are realized at present and topics of common scientific interest are studied. The Department also participated at the international colloquium on the agricultural transition and land tenure organized at the University of Riga (Latvia).

Cooperation with the University of Paris IV-Sorbonne (France) has a long tradition, too. It includes lecture visits and joint colloquia on population and settlement geography. Students and lecturers exchange programmes were jointly organized with the Geographical Institute, Humboldt University, Berlin (Germany). At the moment focus is on the short-term visits of academics.

The Tempus Programme (1992 – 1994) has much helped to extend international contacts. It was chiefly aimed at upgrading geographical knowledge (namely in social geography and demography). Both academics and geography students participated in Tempus; universities in Amsterdam, Dublin, London, Madrid, Manchester, and Paris were among the partner institutes. The 1994 IGU Regional Conference has been organized by the Faculty of Science, Charles Unversity in Prague. Many new personal and official contacts have been established during the Conference. Only the most important ones will be mentioned in the further text.

Three publications have been published as a result of the joint project with the Department of Geography, University of Amsterdam focused on the social geographic transition in Czechia.

London School of Economics and Political Sciences organized specialized courses on regional and local administration in 1993 and 1994 in cooperation with the Department. These courses were labelled as one of the best British Council programmes in Czechia. A long-time agreement on mutual cooperation has been concluded with the Berne University (Switzerland). It is aimed at education of futute teachers and upgrading teachers' geographic knowledge. This cooperation includes exchange of experts, students, and teachers, as well as articles in specialized journals. The American/Czechoslovak colloquium on the transtition of society and environment held in 1991 in Prague has opened the collaboration with Dartmouth College, New Hampshire, U.S.A. The "American Term" for Dartmouth students has been organized at the faculty of Science, Prague already third time in early 1996. The American students spent 70 days in Czechia and attended various lectures and excursions.

The Department participates in various international projects. The brain drain problems are researched in cooperation with the University of Leuven (Belgium); moreover there are projects on the transformation of retail services and housing in Prague, refugees problems, and foreign workforce. Land-use and land cover changes plus the regional aspects of the changing nature/society relations are researched in cooperation with US and Polish experts. The Czech Grant Agency helps to finance various joint projects with Czech experts from other institutes (regionalization, changing patterns of urbanization). As a result, Czech experts can participate in international conferences and colloquia and establish contacts with research institutes in the EU countries.

The Department has organized scientific field trips for various partner universities (Amsterdam, Berne, Bonn, Dublin, Strasbourg, Warsaw) over the past few years. These trips have been complemented by lectures on topical spatial processes in the Czech Republic.

650 years anniversary of Charles University will be celebrated since autumn next year. Colloquium focused on the regional aspects of the societal and economic transition will be held in Septmeber 1997 as part of the celebrations. Slovak and Polish experts are expected to participate so that the transition in Czechia, Poland, and Slovakia could be compared. Whole issue of the university journal Acta Universitatis Carolinae (AUC) will be devoted to this colloquium. Such thematic issues have already been published on similar occassions (US/Slovak issue in 1992, Czech/Irish in 1993, Czech/Polish in 1994).

Ivan Bičík

Department of Physical Geography and Geoecology, Faculty of Science, Charles University, Prague. At present the departmental staff consists of 12 scholars. The scientific activity includes basic and applied research and covers all branches of physical geography: Quaternary geomorphology and paleogeography, climatology, meteorology, hydrography, hydrology, pedogeography, pedology, biogeography, as well as geoecology – a modern synthetic subdiscipline.

The pre-1989 international cooperation focused on intensive contacts with the Moscow State University, Russia. It included regular students' excursions and lecture visits. These traditional links were weakened after 1989; at present, however, are being revitalized.

There is an ongoing expert cooperation with the Warsaw University, Poland. Geographers from Warsaw and Prague attend regular meeting and exchange information on research work at both universities.

Contacts with various West European universities have been much intensified since 1989. A number of departmental teachers and students have visited universities in Amsterdam and Madrid as part of the TEMPUS programme. Four theses have been compiled at host universities.

The successful participation in the international project "Elbe" as part of the cooperation with the University of Hamburg, Germany, has been started in 1991. A number of theses on hydrology compiled by Czech and German students became also part of the project as well as four doctors' theses. Results of the joint research have been published under the title "Biologische Effekte von Schadstoffen und toxisches Potential von Wasser und Sediment in Elbe und Nordsee." Three students' excursions have already been organized in cooperation with the Hamburg University.

Intensive contacts with the Berne Univerity, Switzerland, have brought exceptionally good results. Swiss geographers have made three field-trips to Czechia and Czech geographers went once to Switzerland. This collaboration resulted in three publications released in Berne. At present there is an ongoing close cooperation with teachers from the Geographical Institute, Berne, in the field of hydrology and regional geography. Joint Czech/Swiss expedition to the Baikal Lake, Russia, will be organized in summer 1996.

The Department participates in the international project "Dynamic Geomorphology of Tectonically Active Zones" which is coordinated by the IGU Natural Hazard Studies working group. In the framework of this project the Department mostly cooperates with experts from Manchester, Strasbourg, and Heidelberg.

Similar topics have been researched in the Cordillera Blanca Range, Peru. Hazardous geomorphological and hydrological processes have been studied in cooperation with Peruvian institutes (Univesidad Nacional Mayor de San Marcos, Lima; Elektroperu).

Thriving contact exist with physical geographers at the Mainz University, Germany. Apart from students' excursions a joint research focused on habitat mapping in the National Park Šumava has been organized. At present there is a cooperation in the field of ecology and revitalization of water courses.

The Department also maintains contacts with universities in Passau and Munich (Germany) and with the University of Vienna, Austria.

Bohumír Janský

Department of Demography and Geodemography, Faculty of Science, Charles University, Prague was founded in 1990. The Department provides courses on demography, geography, and related subjects. It belongs among leading Czech institutes in the field

of social research. The departmental staff consists of nine full-time university teachers.

The Department boasts a long tradition of collaboration with foreign research institutions and universities. Contacts with French institutes were among the earliest. Cooperation with the National Institute of Demographic Studies (INED) in Paris dates back to the 1960s. (The present-day Department was part of the former Dpt. of Economic Geography at that time). The Czech version of R. Pressat's textbook *L'analyse démographique* (1968) was one of the first results of this successfull collaboration. Contacts with the French demographic school has later become the cornerstone of research and teaching activities at the Department. Currently, there are joint publications with INED as well as exchange programmes. Conferences on various demographic topics are also being held in cooperation with French colleagues. These meetings are organized in the framework of the agreement with the University of Paris I Pantheón-Sorbonne and take place alternatively in Prague and Paris. The last one was held in 1994 and focused on households and families. Family policies will be discussed at the next meeting in May 1996. Of the other French-speaking countries the Department maintains close contacts with the Catholic University of Louvain-la-Neuve (Belgium).

Contacts with the Netherlands Interdisciplinary Demographic Institute (NIDI) in The Hague and with the Istituto di ricerche sulla popolazione (IRP) in Rome have intensified since the early 1990s. In both cases the collaboration is part of the comparative research on population climate in developed European countries.

The Department has become a co-founder of the European Observatory for Population Education and Information. A number of European demographic institutes are grouped in this organization under the UNESCO auspicies. It focuses on raising the public awareness in demographic issues. Close contacts between the Department and the René Descartes University, Paris V have been established through this network.

The German Institute for Population Studies, Wiesbaden, is the number-one partner within the German-speaking countries. This cooperation consists mostly of students exchange programmes and information exchange. Members of the Department also regularly take part at the meetings organized by the Humboldt University, Berlin.

The international contacts, however, are not exclusively focused on West European countries. There are traditional links with Russian and Hungarian demographers. The collaboration with the Institute of Statistics and Demography at the Warsaw School of Economics has much intensified recently.

The most important international activity of the Department, however, is the International Summer School in Demography and Geodemography organized annually in the Czech Republic. It is attended by foreign university students who intend to improve their demographic knowledge. Lectures on all basic demographic issues delivered by renowned demographers from all over the world, including the United Kingdom and the U.S.A., form the core of the Summer School. The 7th Summer School will be organized in 1996.

Jiřina Kocourková, Libor Strouhal

Department of Cartography and Geoinformatics, Faculty of Science, Charles University, Prague focuses on theoretical cartography, cartographic informatics, cartographic modelling, digital technologies, geographical information systems, cartographic expert systems, and remote sensing applications.

The Department actively participates in the Commission for National and Regional Atlases affiliated to the International Cartographic Association. The Commission consists of full-time members and members-correspondents from 37 countries. The Commission assembles once a year; the last meeting was held in Barcelona, Spain in 1995. The next annual meeting will take place in Prague (July 31-August 3) under the patronage of the Department. The Commission coordinates publishing of national and regional atlases, accumulates relevant data and provides exchange of information. Development of atlas information systems and creation of multimedia atlases has recently become part of the intersert range, too. The Department has an official representative in the Commission for National and Regional Atlases. One member of the Department is a honorary member of The Planetary Society, USA.

The Department collaborates with Ruprecht-Karls-Universität, Heidelberg (Germany), Ludwig-Maxmilians-Universität, München (Germany), University of Manchester (GB), Uniwersytet Warszawski (Poland), Österreichisches Ost– und Südosteuropa Institut, Wien (Austria), and Institut für Länderkunde, Leipzig (Germany).

Tomáš Beránek

Department of Geography, Faculty of Science, Masaryk University, Brno.
Grants with international co-operation: Production of GIS in the CR. (Contemporary conditions of optimal development and of applications in international context.) – The grant state of art of data standarts and data interoperability in the both government and local level for geographic information systems (GIS), it also deals with conditions and barriers influencing optimal development of GIS in the Czech Republic (foreign partner: Dpt. of Geography, Lab. on Geoinformatics, University of Vienna).

– Changes in the energy balance and in the UV-radiation intensity and their influence on natural ecosystems in Antarctica. Main solution problem investigating of quantitative formulated influences of radition and heat balance components in south polar summer on the existence of primitive plants and plant communities from point of view of their physiological functions and dynamic of development (foreign partner: Dpt. of Antarctic Biology PAS, Warsaw).

– Reference climatic year. Oriented on climatological definition of reference climatic year and its use in modelling of heat and humidity behaviour of building objects and constructions and their optimalisation in climate conditions of Moravia (foreign partner: Technical University Lyngby, Denmark).

Other international contacts and cooperations: Cartography and GIS: Dpt. of Geography, Lab. on Geoinformatics, University of Vienna (capture and maintenance of digital data and its implementation into regional and municipal geographic information system); Institut of Geosciences, University of Bochum (digital mapping, spatial fundaments for data collection and analyses, environmental evalution of landscape using GIS and remote sensing); Laboratory S.I.T., J. Curie University Paris (object-oriented GIS, HBDS methodology for geographical knowledge structuring, GIS databases); US Census Bureau Washington (global databases, information superhighway, geoinformation communication, data standards for GIS); Japan Map Centre Tokyo (thematic cartography and digital mapping, visualisation of geographic data); Dpt. of Geography, University of Illinois (role of map in GIS and remote sensing, visualisation as a modern tool for cartography); Dpt. of Cartography, University of Utrecht (education, training courses in cartography, digital mapping, GIS and remote sensing, visualisation and Internet); Dept. of Physical Geography, University of Wroclaw (geomorphologic processes with special focus on weathering and climate, mapping in geomorphology).

Climatology: Slovak Hydrometeorological Institute, Bratislava – Central Institute for Meteorology and Geodynamics, Vienna – Croatian Hydrometeorological Institute Zagreb – Hungarian Meteorological Service, Budapest – Institute for Meteorology and Water Management, Cracow – Paul Scherrer Institute, Villigen – Hydrometeorological Institute, Ljubljana – National Institute of Meteorology and Hydrology, Sofia (short-term and long-term fluctuations of maximum and minimum temperatures as well of the daily temperature range were studied in central Europe and Bulgaria during 20th century); Slovak Hydrometeorological Institute, Bratislava – Central Institute for Meteorology and Geodynamics, Vienna – Croatian Hydrometeorological Institute Zagreb – Paul Scherrer Institute, Villigen (short-term and long-term fluctuations of maximum and minimum temperatures as well of the daily temperature range were investigated for the mountain regions in central Europe with special contrentration on the Alps); Institute of History, University of Bern – Institute of Geography, University of Würzburg (Collaboration is oriented on the reconstruction of climate patterns of the 16th century and their impacts in Europe. Collaboration is based on the regional temperature and precipitation indices and daily weather records.); Slovak Hydrometeorological Institute, Bratislava (fluctuations of climatic characteristics of selected meteorological elements in the mountain stations in the Czech and Slovak Republic during 1941-1995 are studied) – Dpt. of Antarctic Biology PAS, Warsaw; Institute of Polar Ecology, Christian-Albrechts-University Kiel; Hungarian Meteorological Service, Budapest, Institute for Atmospheric Physics.

Geomorphology: Dpt. of Physical Geography, University of Wroclaw (The comparison of granite landforms, geomorphic development in the border regions of the Czech Republic and Poland. Rock structure and neotectonic movements are to be assessed to recognise their influence on the landforms history.).

Landscape Ecology: Institute of Landscape Ecology, SAS Bratislava (landscape ecological research).

Social Geography: Equipe P.A.R.I.S., CNRS Paris (investigation of internal structure of some European countries by the studying of migration flows and transportation ones).

Didactic Geography: Dpt. of Geography, University of Vienna (geographical education, geographical curriculum, field work education, teaching and learning as a management process) – Open University, Milton Keynes, Great Britain (environmental policy in an international context, environmental education, tutorials). *Pavel Prošek*

Department of Geography, Faculty of Science, Palacký University, Olomouc provides training for future geography teachers in combination with various other subjects.

Most international contacts of the Department have recently focused on the complex studies of natural components, and on the long-time exchange programmes. The latter aimed to introduce modern geographical methods into the educational system, especially geographical information systems and remote sensing. The Department participated in the International Expedition Putorana'90 (Russia). Members of the Department have lectured on universities in Japan, Canada, The Netherlands, Poland, Austria, and the U.S.A.

Members of the Department participated in a number of international conferences on geomorphology, geographical information systems, and remote sensing. These participations were often co-sponsored by cooperating foreign institutions. Members of the Department also work in organizational committees of international conferences. As a result, Olomouc gradually becomes a conference centre.

The most important cooperating universities and institutes are: Uniwersytet Marii Curie Sklodowskiej, Lublin (Poland); Uniwersytet Adama Mickiewicza, Poznan (Poland); Geographische Institut, Universität Wien (Austria); Österreichisches Ost– und Südosteuropa Institut, Wien (Austria), branch office Brno; Joanneum Research – Institute for Image Processing and Computer Graphics, Graz (Austria); Agricultural University Wageningen (The Netherlands); Hebrew University of Jerusalem (Israel); Birbeck College, University of London (UK); Coventry University (UK), and GEOPS B. V. Arnhem (The Netherlands).

Contacts with Uniwersytet Marii Curie Sklodowskiej, Lublin (Poland) and with Geographische Institut, Universität Wien (Austria) enabled annual excursions of geography students to the respective countries.

Miroslav Vysoudil

Department of Social Geography and Regional Development, Faculty of Science, Ostrava University has come into existence in September 1995 when the former Department of Geography and Geoecology has been divided in two separate departments. The departmental staff numbers nine University teachers.

The Department provides training for future geography teachers as well as specialized five years M. A. courses focused on social geography and regional development.

As regards international contacts, an active cooperation with the following Polish institutes exists: Wydzial Nauk o Ziemi Uniwersytetu Slaskiego, Sosnowiec; Instytut Slaski w Opolu; Uniwersytet w Opolu; Department of Political Geography and Regional Studies, University of Lodz.

There is also a traditional and long-time cooperation with the Department of Geography and Landscape Ecology, Faculty of Science, Matej Bel University, Banská Bystrice (Slovakia).

Extensive research contacts are maintained with the Austrian Institute for Eastern and South-Eastern Europe, Vienna (Austria). Agreement on mutual cooperation has been signed with the Catholic University of Eichstätt (Germany). The former contacts with geographical institutes in Erfurt and Dresden (Germany) have been resurrected recently.

Agreements on mutual cooperation with Slovenian geographical institutes in Ljubljana and Maribor as well as with the University of Graz (Austria) are being prepared.

Several university scholars from Czechia and foreign countries have lectured at the Department in 1995. There have been lecturers from the University of Bonn (Germany), University of Amsterdam (The Netherlands), the Austrian Institute for Eastern and South-Eastern Europe, Vienna (Austria), Zagreb University (Croatia), University of Ljubljana (Slovenia), etc. Host programmes were sponsored by the Czech University Development Fund.

The Department will maintain the above mentioned contacts in future.

Petr Šindler

Department of Geography, Pedagogical Faculty, J. E. Purkyně University, Ústí nad Labem has signed an agreement on mutual cooperation with the Geographical Institute, Technische Universität Dresden (Germany) in July 1995. The Dresden colleagues offered participation in the research programme "Geographical Education at the Beginning of the 21st Century". Members of the Department also participate in the joint programme "Euroregion Elbe-Labe". Dresden academics delivered lectures on the spatial distribution of economic activities in former East Germany at the Department in 1996. Members of the Department participate in geographical colloquia in Dresden. There is also

a students exchange programme; the Department organizes geographical field trips for Dresden students and Czech students practise field work in Saxony.

Based on the contacts from the Communist era, extensive contacts with Russian institutes exist. Head of the Department became an external member of the scientific committee at the Geographical Faculty, Russian Free University. He takes part once a year at the Faculty meetings and deliveres lectures. Contacts with other leading Russian geographical departments and institutes are also maintained. As an example, head of the Department had a lecture on regionalism in small countries at the Russian Symposium on Regional Studies in Nizhny Novgorod in June 1994.

One member of the Department visited the Department of Geography, Algemene Hogeschool, Amsterdam (The Netherlands) in 1993. Consequently the Dutch academics have organized an educational week course at Ústí nad Labem for Northern Bohemian teachers as part of the "Teaching the Teachers" programme.

The Department participates in the Euroregion Nisa activities, namely through the contacts with Akademia Ekonomiczna Wroclaw and its branch institute in Jelenia Gora (Poland). There is also an ongoing collaboration with the Hamburg University (Germany). Field trips for the Osnabrück University students (Germany) are organized on a regular base. There is a draft for cooperation with Suny Cortland University (USA) that would focus on geographical information systems, regionalization, and environmental education.

Jiří Anděl, Ladislav Skokan

Department of Geography, West Bohemian University, Plzeň maintains international contacts mostly with German, Polish, and Slovakian institutes and departments. The cooperation includes participation in international conferences, joint geographical research, students and lecturers exchange programmes, field work, consulting doctor's theses, and joint publications.

There is an ongoing collaboration with Lehrstuhl für Wirtschaftsgeographie und Regionalplanung, Universität Bayreuth (Germany). Both departments participated in a joint project on privatization in Czechia (case study Pilsen). Results have been published and presentations dealing with privatization were delivered at conferences in Pilsen and Bayreuth.

The Department has also thriving contacts with Lehrstuhl für Sozial- und Wirtschaftsgeographie, Technische Universität Chemnitz-Zwickau (Germany). Scholars from both departments have delivered lectures at conferences in Pilsen and Marktredwitz. Articles on the development of Euro-regions, urban geography, and cross-boundary cooperation in Euroregio Egrensis were published in Pilsen, Chemnitz, and Zwickau.

The collaboration with Widzial transportu i lacznosti, Uniwersytet Szczecinski (Poland) focuses on participation in joint conferences.

The Department co-organized the 5th meeting of the German/Czech/Slovak Society (Academy for Spatial Studies and Regional Planning) held in 1995. This meeting focused on regional planning concepts as part of cross-boundary cooperation in Czechia.

The conference in Teplá (West Bohemia) on the landscape potential and revitalization of the Slavkovský les Mts. has also been organized by the Department as part of the collaboration with Euroregio Egrensis.

Stanislav Mirvald

The Czech Geographic Society Publishing House. The publishing house bearing the name of the Czech Geographic Society (ČGS) has come into existence in 1992 in view to help the geographical education by compilation of new schoolbooks of geography. Since that time, the publishing house is a private enterprise whose financial backing of the ČGS sensibly helps the Society to carry on its activities.

Besides the financial backing, the activities of the Czech Geographic Society Publishing House are connected with the ČGS mainly by using the large base of the ČGS members. A good professional quality of published books is due to the participation of leading geographers from universities, secondary and elementary schools as authors or readers of schoolbooks and other publications. Between the co-workers we can find not only university teachers, but also a number of geography teachers from different types of schools from different parts of the Czech Republic. They co-operate as readers of manuscripts, some of them as co-authors of some publications.

The five-year existence of the ČGS Publishing House is characterized, besides the backing of the ČGS's activities, by rich editing activities which sensibly contribute to the quality of ge-

ography teaching at Czech schools. At first, the publishing house has compiled a basic series of textbooks for secondary schools which, at that time, totally lacked acceptable textbooks of geography. A series including six modern and richly illustrated schoolbooks covering all the main themes of the curriculum have been progressively published. At present, they are used at the majority of grammar schools, as well as at some other secondary schools in the Czech Republic. Most of them have been published in two or three new editions and progressively completed and adapted to the development in the world and in the Czech Republic.

This series has been soon completed by a new one destined to elementary schools. It includes six workbooks oriented at main themes of the geography curriculum of elementary school's higher classes. These workbooks, too, have been published in further modified editions, as the publishing house aims to have its publications constantly developed and perfected. This series includes also a workbook for the 9th class pupils which are more numerous since the introduction of the compulsory nine-year education.

The third series, which has been already entirely completed, is the edition of the so-called blind or contour maps usable at schools of all levels and types, including universities.

The secondary school textbooks are progressively completed by a series of different manuals. The first one published is a set of questions and projects destined to secondary school teachers and pupils. It has been followed by a geographical view on environmental problems, destined not only to geography teachers for they could master this important theme, but also to a large public. In the same time, it is used as textbook at some specialized secondary schools. The secondary school textbooks are completed by a small dictionary explaining the scientific expressions contained in the textbooks mainly to students, but in the same time helping teachers in their work. The for the present last publication of that series is the Geography sketch-book including simple sketches for the needs of geography teachers.

This year the ČGS Publishing House has started to compile a new series of textbooks of geography for elementary schools. They have a new two-level conception, clearly (graphically) distinguishing the basic and the complementary matter. This presentation of textbooks allows their universal usage both at elementary and select schools. Two first volumes of this series have been up to now published, the five others will be published in 1996 and 1997.

In the future, the publishing house intends to enlarge its activities to publishing of textbooks of some other school matters, mainly of biology.

However, the activities of the publishing house are not limited to schoolbooks. At the occasion of the ČGS's centenary, it published a volume on the 100 years of its activities. Further more, two volumes of a road guide through the busiest routes in the Czech Republic, as well as the up-to-now only book in English "The Czech Republic in brief", have been published. The latter one is destined to foreigners wishing to get briefly acquainted with the natural, social and economic situation of the Czech Republic, as well as with the main tourist attractions it offers to foreign visitors.

Anybody who would be interested in a more detailed information about this publishing house activities, or in individual published volumes (all of them being constantly disposable), can address the Nakladatelství České geografické společnosti, Prostřední 10, 141 00 Praha 4, phone: 02-61223607, fax: 02-496477.

Milan Holeček

Expedition Peru'1995. The Expedition Peru'1995 has been organized in the framework of the 75th anniversary of the Faculty of Science, Charles University, Prague. It also aimed to pay honour to the victims of the giant earthquake in the Huascaran region which happened on May 31, 1970. That time, the whole Czech mountaineering expedition appeared among 67,000 victims.

The Expedition Peru'1995 consisted of 13 members (mostly Faculty of Science students and graduates) under the leadership of Prof. B. Janský. Prof. Janský has lectured at Universities of Lima and Cuzco in 1990; regional geography of Latin America is his main scientific focus. The group has travelled almost 6,000 km in Peru in between June 27 and September 11, using various means of transport - buses, off-road vehicles, planes, boats, motor boats, canoes, horses and hinnies, moutain bikes and own feet.

The quotation of Gacilaso de la Vega, Incas chronicler, that has been repeated by Alexander von Humboldt during the first European scientific expedition to South America, became our motto: "The journey from Peruvian Sea over the snow-capped Andes to the Amazon resembles a voyage from equator towards poles; one passes through all landscape types." Being true geographers, a visit to all three major landscape regions of Peru was a must for us:

the coast (*Costa*), the mountainous region of Andes (*Sierra*), and the tropical rain forest (*Selva*). We have studied outstanding natural features as well as unique monuments of past civilizations. Current political and economical affairs were also within our interest range, as were the social and cultural conditions with a special focus to environmental protection.

Our chief aim was to make a series of films that would document the incomparable natural variety, most important historical monuments and current life of local people. To do so, we used the equipment of KF, Jiří Trnka Studio, Barrandov. The group has been accompanied by cameraman.

The Expedition first travelled north to the highest promontory of Andes called Cordillera Blanca. We have visited the area that suffered from the earthquake of May 31, 1970 (strength 7.8 of Richter scale). The earthquake was immediately followed by a giant landslide from Nevado de Huascarán. Six metres thick layer of rock, snow, and clay covered the town of Yungay having killed its inhabitants. The Czech mountaineering expedition was smashed in the base camp at Lake Llanganuco (altitude 3,850 m). To commemorate the memory of Czech mountaineers, 4 members of our group cycled from the tragic place up to the pass Portachuelo de Llanganuco (4,767 m) and futher down to Yungay.

A rather difficult section followed. We travelled along the Río Santa River towards the coast, having passed through a series of hairpin bends between Huaylas and Huallanca. Journey through the dry region of Cordillera Negra and along the Pacific Coast took two days. Then we reached Pucala near Chiclaya - place which is over 40 years home to Czech Dušan Honke-Houfek. The story of his life is an interesting one: having experienced the partisan war in Yugoslavia, he dramatically fled Czechoslovakia in 1950s and finally became a leading person in the sugar industry in Peru. He has founded and managed over many years the sugar refinery cooperative in Pucala. We spent an interesting week there having studied various kinds of sugar cane production. The Expedition has also been shown the functioning and internal structure of this co-op that has its own school, hospital, transport, and retail facilities.

Then we travelled south on the Panamerican Highway along the coast. Our interest was mostly focused on the unique monuments from the pre-Inca era. The Expedition visited the Lambayeque District (Master of Sipan Grave), and region close to Trujillo (Chan-chan, the largest ruined town from the Chimú period; Huaca de Sol and Huaca de la Luna Pyramids from the Mochica period).

Visit to the Lachay National Park, 100 km north of Lima, was an exotic one. The typical vegetation cover called *lomas* exists there thanks to frequent thermic inversions above the cool Humboldt Stream and the misty stratum *garúa* in the altitude 700-1,00 metres. After saying good-bye to Lima we moved southwards up to the Paracas Peninsula. We studied the abundant marine fauna in the local nature reserve. This area is cooled by the Humboldt Stream; the deep cold water surface here and brings a lot of nutriments. Regarding the biological variety, the region is one of the richest parts of the ocean. Canoeing along the rugged cliffs of Islas Ballestas and Isla San Gallán belonged among the most memorable experiences.

Arequipa, the second city of Peru, is known as "Ciudad Blanca" (White City). The Expedition used it as a base for further explorations. Arequipa has been built from white volcanic tuffs and resembles Andalusian towns. We travelled from Arequipa on a difficult track over deep canyons and elevated plateaus towards the mountain ranges of Cordillera de Chilca in Southern Peruvian Andes. This is an area of recemt volcanic activity. First, the Expedition visited the world's deepest canyon - Cotahuasi Canyon (depth 3,550 m), having used horses and hinnies in the final part of this journey. Afterwards, we climbed up from the bottom to the plateau at the foot of the extint volcano Nudo Coropuna (6,615 m) and descended to Valle de los Volcanos. This is a valley with innumerable volcanic cones including many that are just tens of metres high. Then the Expedition moved towards the origins of Apurímac - the upper course of Amazon, the world's longest river. After a difficult journey in an off-road vehicle we spent a very cold night (temperature -10^{o}C) and underwent a long hike in order to reach the foot of Nevado de Mismi (5,597 m). The longest river of all originates in this swampy area, 7,025 from the Atlantic Ocean. We then went on to the 3,200 m deep Colca Valley which is a region with unique pre-Inca irrigation complexes. Seven Expedition members climbed Peak Fatima (6,012 m) in Nevado Chachani Range on the way back to Arequipa.

Having used a night train, the Expedition travelled through the Crucero Alto Pass (4,471 m) and reached Puna at the shore of Lake Titicaca. One Expedition member then surfed across the Lake among the reedy islands Islas Uros, Isla Taquile, Isla Amantani, and Isla de Soto to the eastern shore and back; altogether it was a 130 km long adventure in the altitude of 3,812 m.

The way to Cuzco (former capital of the Inca Empire) took a full day on a train and included a passage through the elevated plateau Altiplano de Qollao and La Raya Pass (4,318 m). From Cuzco we set out to the Sacred Inca Valley along the Urubamba River with many pre-colonial monuments. Machu Picchu, the mysterious Inca fortress placed on a rocky cliff above Urubamba, was devoted a lot of attention. We also visited some other Inca monuments: the Cuzco itself and Sacsahuaman Fortress at Cuzco outskirts.

The Expedition explored the tropical rain forest in two regions: in the Madre de Dios catchment and in the surroundings of Iquitos. First, we travelled on a small truck up to the

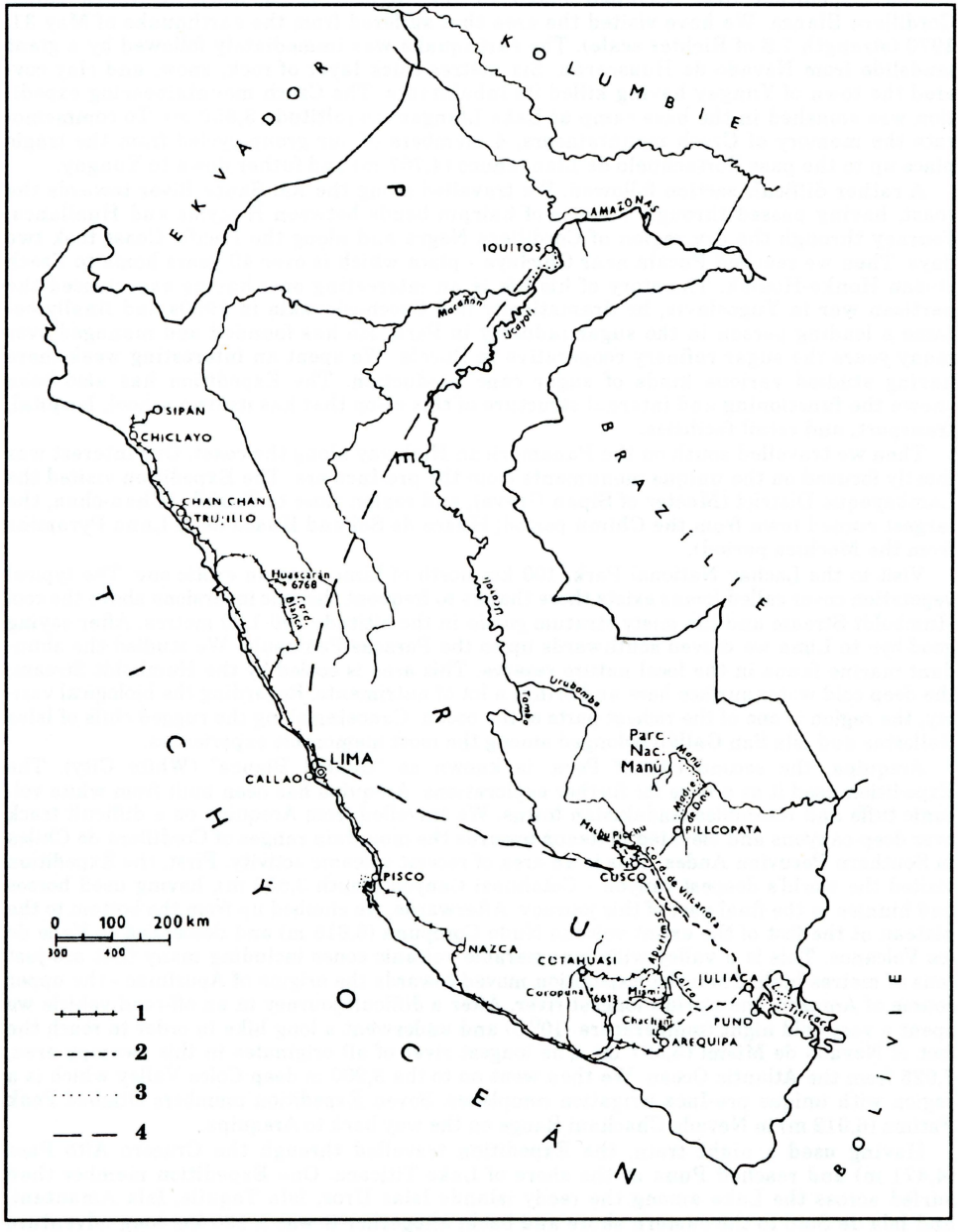

Fig. 1 - The route of Expedition Peru'1995; 1 - by car, 2 - by train, 3 - by boat, 4 - by plane.

Eastern Cordillera Range (4,200 m) and afterwards descended through all vegetation zones to Madre de Dios River (450 m). The Expedition canoed downstrem on a narrow, 14-metres long canoe until the confluence with Manu and then upstream to the core part of Mana Biospheric Reserve. Typical rain forest species including varied flora, caymans, turtles and many birds were observed there. Our visit, however, proved to be too short to become really familiar with the rain forest which contains an unsurpassed biological diversity there. Our picture of Amazon has been completed in Iquitos, the uppermost port serving large freight ships. The city is 3,600 km far from the Atlantic coast and ships pass across the whole Brazilian Amazon. Four Expedition members sailed from Iquitos upstream to the confluence of two major streams that form the Amazon River: Marañon and Ucayali.

Final part of the whole voyage was centered to Lima - city with population of 8 million. We have observed all problems of the immense urban growth. Lima grows faster than most other cities in Latin America; almost half of its citizens, however, live in shanty towns called *pueblos jóvenes* with no public utilities and in conditions of heart-wrenching poverty.

Bohumír Janský

Geographical Departments and Institutes at Czech Universities

(for Head of Department See the Brackets)

Faculty of Science, Charles University, Prague
Department of Social Geography and Regional Development (*Ivan Bičík*)
Přírodovědecká fakulta Univerzity Karlovy
Katedra sociální geografie a regionálního rozvoje
Albertov 6, 128 43 Praha 2
tel.: 42-2/21952416; fax: 42-2/296025

Faculty of Science, Charles University, Prague
Department of Physical Geography and Geoecology (*Jan Votýpka*)
Přírodovědecká fakulta Univerzity Karlovy
Katedra fyzické geografie a geoekologie
Albertov 6, 128 43 Praha 2
tel.: 42-2/21952424; fax: 42-2/21952341

Faculty of Science, Charles University, Prague
Department of Demography and Geodemography (*Zdeněk Pavlík*)
Přírodovědecká fakulta Univerzity Karlovy
Katedra demografie a geodemografie
Albertov 6, 128 43 Praha 2
tel.: 42-2/21952423; fax: 42-2/296084

Faculty of Science, Charles University, Prague
Department of Cartography and Geoinformatics (*Dalibor Moravec*)
Přírodovědecká fakulta Univerzity Karlovy
Katedra kartografie a geoinformatiky
Albertov 6, 128 43 Praha 2
tel.: 42-2/21952440; fax: 42-2/21952341

Faculty of Science, Masaryk University, Brno
Department of Geography (*Pavel Prošek*)
Přírodovědecká fakulta Masarykovy univerzity
Katedra geografie
Žerotínovo nám. 9, 601 37 Brno
tel.: 42-5/42128111; fax: 42-5/42128300

Faculty of Science, Palacký University, Olomouc
Department of Geography and Didacticism of Geography (*Miroslav Vysoudil*)
Přírodovědecká fakulta Univerzity Palackého
Katedra geografie a didaktiky geografie
tř. Svobody 26, 771 26 Olomouc
tel.: 42-68/5222451-6; fax: 42-68/5228047

Faculty of Science, Ostrava University, Ostrava
Department of Social Geography and Regional Development (*Petr Šindler*)
Přírodovědecká fakulta Ostravské univerzity
Katedra sociální geografie a regionálního rozvoje
Hladnovská 9, 710 00 Slezská Ostrava
tel.: 42-69/6216960, 42-69/6226300; fax: 42-69/6222803

Faculty of Science, Ostrava University, Ostrava
Department of Physical Geography and Geoecology (*Vladimír Kříž*)
Přírodovědecká fakulta Ostravské univerzity
Katedra fyzické geografie a geoekologie
Bráfova 7, 701 03 Ostrava
tel.: 42-69/6222808; fax: 42-69/6222803

Pedagogical Faculty, J. E. Purkyně University, Ústí nad Labem
Department of Geography (*Ladislav Skokan*)
Pedagogická fakulta UJEP
Katedra geografie
České mládeže 8, 400 96 Ústí nad Labem
tel.: 42-47/5214417; fax: 42-47/5212053

Pedagogical Faculty, West Bohemian University, Plzeň
Department of Geography (*Stanislav Mirvald*)
Pedagogická fakulta Západočeské univerzity
Katedra geografie
Sedláčkova 38, 306 19 Plzeň
tel.: 42-19/7237951-5; fax: 42-19/7235522

Pedagogical Faculty, Masaryk University, Brno
Department of Geography (*Petr Chalupa*)
Pedagogická fakulta Masarykovy univerzity
Katedra geografie
Poříčí 7, 603 00 Brno
tel.: 42-5/43321216; fax: 42-5/43211103

Pedagogical Faculty, South Bohemian University, České Budějovice
Department of Geography (*Jan Kubeš*)
Pedagogická fakulta Jihočeské univerzity
Katedra geografie
Jeronýmova 10, 371 15 České Budějovice
tel.: 42-38/55801-3, 42-38/55709; fax: 42-38/58684

Institute of Geonics, Brno (*Antonín Vaishar*)
Ústav geoniky AV ČR
Drobného 28, 602 00 Brno
tel.: 42-5/576076, 42-5/573108; fax: 42-5/578031

ZPRÁVY - REPORTS

GEOGRAFIE

SBORNÍK ČESKÉ GEOGRAFICKÉ SPOLEČNOSTI

Ročník 101, číslo 2, vyšlo v červnu 1996

Vydává Česká geografická společnost. Redakce: Na Slupi 14, 128 00 Praha 2. Rozšiřuje, informace podává, jednotlivá čísla prodává a objednávky vyřizuje Nakladatelství České geografické společnosti, Prostřední 10, 141 00 Praha 4, tel. 02/42 22 88. - Tisk: tiskárna Sprint, Pšenčíkova 675, Praha 4. Sazba: PE-SET-PA, Fišerova 3325, Praha 4. - Vychází 4krát ročně. Cena jednotlivého sešitu Kč 25,-, celoroční předplatné pro rok 1996 Kč 100,- (sleva pro členy ČGS Kč 80,-). - Podávání novinových zásilek povoleno Ředitelstvím pošt Praha, č.j. 1149/92-NP ze dne 8.10.1992. - Rukopis tohoto čísla byl odevzdán k sazbě dne 29. 4. 1996.

47 303

ISSN 1210-115X

Cena 25,- Kč

POKYNY PRO AUTORY

Rukopis příspěvků předkládá autor v originále (u hlavních článků a rozhledů s 1 kopií), věcně a jazykově správný. Může být psán na stroji (strana nesmí mít více než 30 řádek průměrně s 60 úhozy) nebo na počítači ve stejné úpravě. Redakce vítá souběžné dodání textu na disketě v textovém editoru T602 (disketu redakce vrací). Rukopis musí být úplný, tj. se seznamem literatury, obrázky, texty pod obrázky, u hlavních článků a rozhledů s anglickým abstraktem a shrnutím. Zveřejnění v jiném jazyce než českém nebo slovenském podléhá schválení redakční rady.

Rozsah rukopisů se u hlavních článků a rozhledů pohybuje mezi 10 – 15 stranami, jen výjimečně může být se souhlasem redakční rady větší. Pro ostatní rubriky se přijímají příspěvky v rozsahu do 3 stran, výjimečně ve zdůvodněných případech do 5 stran rukopisu.

Shrnutí a abstrakt (včetně klíčových slov) v angličtině připojí autor k příspěvkům pro rubriku Hlavní články a Rozhledy. Abstrakt má celkový rozsah max. 10 řádek strojem, shrnutí minimálně 1,5 strany, maximálně 3 strany včetně překladu textů pod obrázky. Text abstraktu a shrnutí dodá autor současně s rukopisem, a to v anglickém i českém znění. Redakce si vyhrazuje právo podrobit anglické texty jazykové revizi.

Seznam literatury musí být připojen k původním i referativním příspěvkům. Použité prameny seřazené abecedně podle příjmení autorů musí být úplné a přesné. Bibliografické citace musí odpovídat následujícím vzorům:

Citace z časopisu:

HÄUFLER, V. (1985): K socioekonomické typologii zemí a geografické regionalizaci Země. Sborník ČSGS, 90, č. 3, Academia, Praha, s. 135-143.

Citace knihy:

VITÁSEK, F. (1958): Fysický zeměpis. II. díl, Nakl. ČSAV, Praha, 603 str.

Citace z editovaného sborníku:

KORČÁK, J. (1985): Geografické aspekty ekologických problémů. In: Vystoupil, J. (ed.): Sborník prací k 90. narozeninám prof. Korčáka. GGÚ ČSAV, Brno, s. 29-46.

Odkaz v textu na jinou práci se provede uvedením autora a v závorce roku, kdy byla publikována. Např.: Vymezováním migračních regionů se zabýval Korčák (1961), později na něho navázali jiní (Hampl a kol. 1978).

Perokresby musí být kresleny černou tuší na kladívkovém nebo pauzovacím papíru na formátu nepřesahujícím výsledný formát po reprodukci o více než o třetinu. Předlohy větších formátů než A4 redakce nepřijímá. Xeroxové kopie lze použít jen při zachování zcela ostré černé kresby.

Fotografie formátu min. 13 × 18 cm a max. 18 × 24 cm musí být technicky dokonalé na lesklém papíru.

Texty pod obrázky musí obsahovat jejich původ (jméno autora, odkud byly převzaty apod.).

Údaje o autorovi (event. spoluautorech) připojí autor k rukopisu. Požaduje se udání pracoviště, adresy bydliště včetně PSČ a rodného čísla.

Honorář se poukazuje autorům po vyjití příslušného čísla. Redakce má právo z autorského honoráře odečíst případné náklady za přepis nedokonalého rukopisu, jazykovou úpravu shrnutí nebo úpravu obrázků.

Autorský výtisk se posílá autorům hlavních článků a rozhledů po vyjití příslušného čísla.

Separáty se zhotovují pouze z hlavních článků a rozhledů pouze na základě písemné objednávky autora. Separáty se proplácejí dobírkou.

Příspěvky se zasílají na adresu: Redakce Geografie – Sborník ČGS, Na Slupi 14, 128 00 Praha 2.

Prosíme autory, aby se řídili těmito pokyny.