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Landscape and Urban Planning 84 (2008) 38–51

LANDSCAPE
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URBAN PLANNING

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Biosphere reserves—An attempt to form sustainable landscapes

A case study of three biosphere reserves in the Czech Republic

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Received 7 November 2006; received in revised form 18 June 2007; accepted 26 June 2007

Available online 22 August 2007

Abstract

Established under the UNESCO's Man and the Biosphere (MAB) Programme, biosphere reserves represent protected areas intended to demonstrate well-balanced relationship between conservation of biodiversity and an appropriate local development. They can be thus considered as an attempt to form sustainable landscape. As sustainable development is a human-centred concept the article contributes primarily to the discussion on social part of the nature–social relationship, namely on quality of life of local population and problems of social acceptance of biodiversity conservation measures. Triangulation approach was applied as a fundamental frame for empirical data analysis, combining analysis of official statistical data, content analysis of regional media, semi-standardized interviews with key personalities and extensive questionnaire survey. Three Czech biosphere reserves were used as model areas. Based on results gained it is possible to state that the concept of biosphere reserve itself can be used as a model when we try to implement ideas of sustainable landscape in practice. However, while quality of life did not seem to be much affected by the fact that people lived in protected areas, full harmonization of biodiversity protection and socio-economic development were hindered by constraints of formal and legislative nature.

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Keywords: Biosphere reserve; Nature protection; Socio-economic development; Sustainable landscape; Triangulation

1. Introduction

In their editorial to one of the latest issues of *Journal of Landscape and Urban Planning*, Potschin and Haines-Young (2006) state that landscape issues are frequently discussed in the context of sustainability, and raise the question on the role landscape ecology, as a branch of science, can play in the general debate on sustainability. They refer, among others, to the concept of sustainable landscape that is discussed and questioned by (Antrop, 2006) in the same issue. Though we can agree with the argument that the whole notion of sustainable landscape development may involve some contradictions, merging landscape and sustainability may yield at least two positive results. Discussion

on sustainability acquires spatial dimension (e.g. Price, 2002); on the other hand, the theoretical concept of cultural landscape (Antrop, 2001; Naveh, 2001; Palang et al., 2005) is “translated” into the more or less effective political scheme, suitable as a basis for practical decision making. In this context, sustainable landscape can be considered as a landscape where trade-offs between nature protection and socio-economic aspirations of local communities are expected to be well balanced. In economic terms it presumes balancing three types of capital—natural, social and cultural (e.g. Farina, 2000; Garrod et al., 2006). In the rhetoric of sustainable development these capitals play the role of the internal potential of a particular region (Jehle, 1998), the potential that can be realised when it meets an appropriate external context (e.g. Kušová et al., 1999; Těšitel et al., 1999).

Nature protection has evolved over time, gradually stressing special themes—the progress can be seen from those starting with protection of particular species to protection of ecosystems until today, when an appropriate management of large scale landscape areas has become a focal point. The focus

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on landscape scale has brought about also a shift in the role local communities are expected to play in this type of nature protection—satisfaction of their socio-economic aspirations has begun to be perceived as an inevitable part of management of protected areas. Such a tendency is evident in Central Europe, where areas having a status of being protected cannot be considered pristine landscapes (Getzner and Jungmeier, 2000; Paavola and Adger, 2005). On the contrary, they are permanently populated cultural landscapes having passed century long transformation by human activities (Boucníková and Kučera, 2005). As a result modern nature protection measures counts with needs of local population in order not to make areas under protection a priori disadvantaged from socio-economic viewpoint (Těšitel et al., 2006a,b). Very important in this context is a definition of nature protection as it has been formulated by IUCN in its World Conservation Strategy. In fact it was anthropocentric in its nature as it considered nature protection to be a management of air, water, soil, mineral resources and living systems, including man, aimed at achieving sustainable quality of life (IUCN, 1980). Later on, the strategic shift has been reflected by the concept of biosphere reserves as it was articulated at the Man and the Biosphere Conference in Seville in 1995 and reinforced by the Seville + 5 Declaration. The concept presumes that biosphere reserves, besides being instruments for conservation of biological diversity, research and educational activities, should be treated as model areas to test the idea of sustainable development. As stated in the Seville Strategy, the link between conservation of biodiversity and the development needs of local communities – a central component of the biosphere reserve approach – has been recognized as a key feature of the successful management of most national parks, nature reserves and other protected areas (e.g. Jeník et al., 1996; UNESCO, 1996, 2001, 2002). Viewed from this perspective, practical implementation of the concept of biosphere reserves can be considered as an attempt to form sustainable landscape.

The search for sustainable balance between sometimes conflicting goals of conserving biological diversity, promoting economic development and maintaining associated cultural values should be handled as a platform for democratic discussion in which all relevant stakeholders are involved. Therefore, key questions on biosphere reserves management, namely provision of local benefits and cooperation and conflicts between representatives of nature protection and other local stakeholders became the focal point of our research. As the article is build on the research results, it tries to contribute primarily to the discussion on social part of the nature–social relationship, namely on quality of life of local population and problems of social acceptance of biodiversity conservation measures.

2. Model areas and methods used

2.1. Model areas

Within the project titled “Participative management of protected areas—a key to minimize conflict between biodiversity protection and socio-economic development of local communities”, relevant data were collected in three model areas –

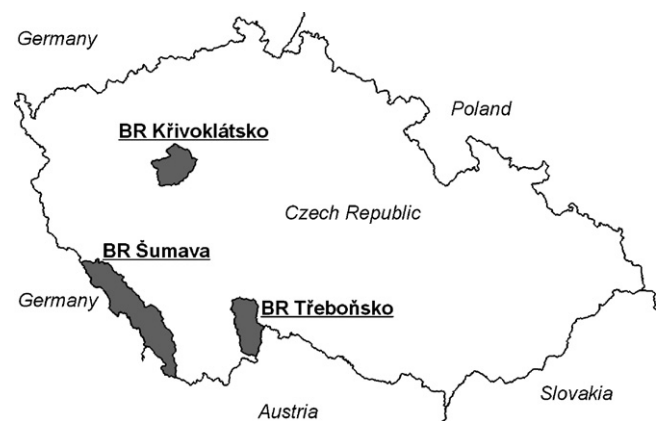


Fig. 1. Model areas—three Czech Biosphere Reserves.

protected landscape areas (PLA) recognized internationally as biosphere reserves (BR) – Šumava, Třeboňsko and Křivoklátsko (Fig. 1). They vary in their natural parameters as well as in their latest socio-economic history, representing thus a relatively broad array of aspects to be taken into consideration when assessing the way nature protection is viewed by local communities (e.g. Bičík et al., 2002).

2.1.1. BR Šumava (<http://www.npsumava.cz>)

The Šumava Mountains represent the least damaged and best preserved mountain forest ecosystems and peat bogs in Central Europe. In the course of the 20th century this area was peripheral and the main economic activities were agriculture and forestry. The post-1948 period was characterized by the presence of the “Iron Curtain” and establishment of a military training area which made the area almost inaccessible for 50 years. Marginality of the region has helped to sustain natural attractions, and led to the designation of the Šumava Protected landscape area in 1963 and the Šumava National park in 1991 (Fig. 2). The biosphere reserve was declared in 1990, and includes the National Park and the Šumava PLA, the total area being 1671 km². Thanks to its geomorphological characteristics and mainly glacial relics, the Šumava Mountains area is listed in the IUCN Red Book of Ecosystems and Šumava wetlands are on the list of Ramsar Convention. Since 2004 most of the territory has become part of the European network Natura 2000.

2.1.2. BR Třeboňsko (<http://www.trebonsko.ochranaprirody.cz/>)

This area was declared biosphere reserve in 1977, 2 years before Třeboňsko PLA was proclaimed. The area of 700 km² of drained lake basin includes a mosaic of varied wetlands as well as dry biotopes with significant diversity of animal and plant species. The dominant landscape phenomenon consists in 465 fishponds, more than 500 pools and old meanders of the rivers Lužnice and Nežárka. This area has been under intense human management roughly since the 12th century but reached secondary biological balance (Fig. 3). This fact allows for unique close coexistence of internationally significant wetlands protected by Ramsar Convention (Třeboň ponds and Třeboň peat bogs), and typical keeping of traditional carp as well as other



Fig. 2. Šumava Mts. scenic view.

economic activities (extraction of raw materials, agriculture, building construction). Since 2004 most of the area belongs to the European network Natura 2000.

2.1.3. BR Křivoklátsko

(<http://www.krivoklatsko.ochranaprirody.cz/>)

The area of 628 km² was named after the royal castle of Křivoklát, which dominates over the valley of the Berounka river. Even nowadays, thanks to the fact that the territory belonged to the Czech crown till the 17th century and was thus used mainly for hunting, large deciduous and mixed forests thrive in this area. Steep slopes of the deep Berounka valley

(Fig. 4) are covered with natural vegetation of different communities, with sporadic rock outcomes hosting xerothermic fauna and flora. Many localities host beautiful meadows of different types, which occurred in the place of original forests and which represent an important part of landscape due to their richness of species. The castle and game park in Lány, a residence of the president, is connected with modern history of the Czech Republic. The factor influencing the land use in the biosphere reserve is the vicinity of the capital city, Prague. Due to its qualities, Křivoklátsko area has been listed among UNESCO biosphere reserves since the Czechoslovak proposal was accepted on March 1, 1977. One year later the area was



Fig. 3. Fishponds—typical feature of the Třeboňsko area.



Fig. 4. Berounka river valley.

proclaimed PLA with its own administration. Since 2004 most of the area belongs to the European network Natura 2000.

2.2. Methods used

Having in mind that sustainable development is a human-centred concept, quality of life was applied as the general frame of interpretation. It can be expressed as physical, mental and social wellness and wholesomeness, referring as well to the theory of subjective well-being (Massam, 2002). Empiric research tried to find out how practical implementation of nature protection measures in the three concrete biosphere reserves have affected the nine respective aspects of quality of life of local population (physical well-being, mental well-being, value system, place they live in, human relations, availability of services, everyday activities, free-time activities, their career).

When quality of life is discussed, double optics can be applied—the objective and subjective ones. The distinction between the two perspectives is evident. The former reflects social consensus or political will, while the latter is based on evaluation of personal experience and aspirations of individual people. All that can be extended to include spatial dimension, as there are not only individual people but whole regions that can be considered rich or poor (Mareš, 1999).

With the aim to grasp both the aspects properly, triangulation approach (Fig. 5) was applied—a combination of methods and dates in order to get several viewpoints upon a topic to be studied (e.g. Olsen, 2004). Following the triangulation research scheme, we analysed objective data provided by official statistics (Kušová et al., 2005a,b). Identification of “media image” of the three protected areas also became one of the conducted tasks, mainly the medially presented cases of successful cooperation or, on the other hand, of possible conflicts between the administration of the protected area and the communities (Kušová et

al., 2005a,b). In parallel, subjective data gained by questionnaire survey and interviews represented a picture on how local people themselves perceive their situations (Těšitel et al., 2005a,b).

2.2.1. Analysis of official statistical data

Data provided by the Czech Statistical Institute were used to describe the status of quality of life objectively. We tested question asking if areas being under special regime of management due to nature protection do differ significantly from the surrounding areas, as to socio-economic milieu concerns. For the purpose of the analysis, model areas were extended to include also municipalities that form their surroundings. It consisted of a stripe around studied protected areas having width of 20 km. Municipalities of interest formed then three groups—lying completely within the protected areas; being in between, i.e. intersected by borders of protected areas; and those having its cadastres completely out of protected areas (Fig. 6).

Different approaches can be traced in pertinent professional literature on how to measure unevenness between regions by use of objective statistical data. In order to identify poor regions in

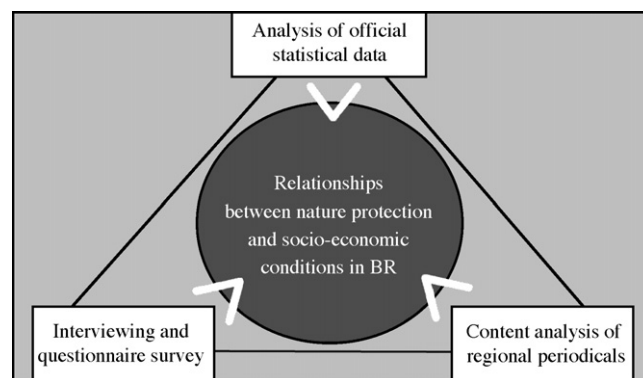


Fig. 5. Scheme of the triangulation approach.

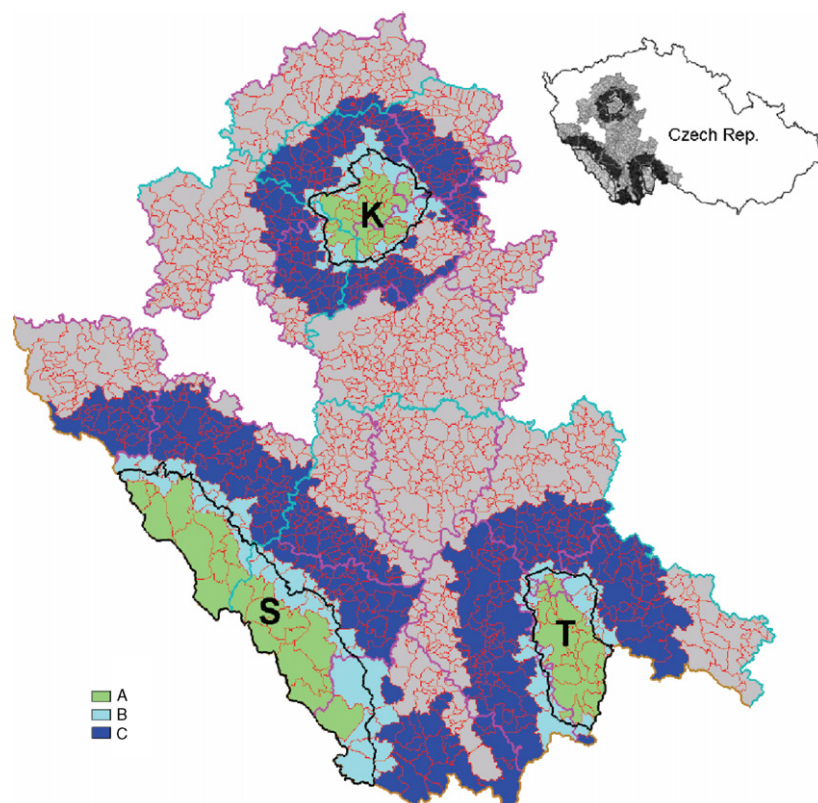


Fig. 6. Model areas for analysis of official statistical data. K-protected landscape area Křivoklátsko; S-National park and protected landscape area Šumava; T-protected landscape area Třeboňsko; protected areas are marked by black lines. Municipalities were divided into three groups according to border of the protected area (A-completely within the area; B-on the border; C-surrounding of the area).

Britain, for example, eight indicators were used (Mareš, 1999). Townsend (1987) refers to another approach. It is based on measuring of degree of poverty of regions as a degree of material deprivation, by use of five criteria. Analogically, Jarman (1984) designs score of unprivileged regions by assigning individual indicators of deprivation by their specific weights.

Two sets of objective data describing our three biosphere reserves as well as their surrounding were used. The first set was made of 10 variables describing type of land use, expressed in terms of share of particular land-use categories within basic statistical unit. The other set characterized socio-economic milieu in the territory by use of basic demographic data, data describing material well-being of inhabitants as well as data on availability of infrastructure and services. All the data were related to municipality level as the basic statistical unit. Individual municipalities were twice processed by use of principal component analysis (PCA)—according to the data on land use and according to the relative socio-economic parameters. Based on results of both ordinations a new parameter “normalized socio-economic status” of municipalities was derived. It was used to test differences between landscape protected areas and their surroundings. All results were visualized by use of GIS technology.

2.2.2. Content analysis of regional periodicals

Taking media as an information source, we followed the general presumption that the press is a part of mass commu-

nication supporting the spread and exchange of information as well as the symbolic concepts addressed to the general public (e.g. MacLuhan, 1991; DeFleur and Ball-Rokeach, 1996). In this perspective, the press was supposed to represent a reflection of the expected interest of the public in concrete problems.

We applied content analysis as a standard sociological technique for studying documents in the same way as it is commonly used in landscape ecological research (e.g. Antrop, 2001; Chipeniuk, 1999). The aim was to reveal medial reflection of concrete examples depicting mutual co-existence of nature protection bodies and locals. Quantitative analysis was complemented by qualitative content analysis that offered a more detailed interpretation of the process in which media constructed reality in relation to problems at hand (Disman, 1993). By use of this technique, comparative monitoring of the pertinent regional press was carried out. The period of monitoring was almost 7 years, from January 1998 to September 2004, and the main aim consisted in documenting “the medial presentation of the relationship between nature protection and communal development”. It was made operable by use of the following key words: Třeboňsko PLA; Křivoklátsko PLA; Šumava PLA; Šumava NP; biosphere reserve; communities; enterprise; cooperation; support; coexistence and conflict. As recorded units; entire articles were used that contained the name of a particular PLA or NP together with at least one of the other key words.

2.2.3. Interviewing and questionnaire survey

In order to get information on how people subjectively reflect quality of their life as well as on what is their relationship to nature protection interviewing of key informants and extensive questionnaire survey were undertaken in all the three model areas in 2004.

Altogether 20 key informants were addressed in each model area by use of semi-standardized interview, being staff members of protected areas administration, mayors of local municipalities, key local entrepreneurs as well as experts in nature protection and regional development. While in general, the interviews focused on their years lasting experiences with practical implementation of all the four basic functions biosphere reserve is expected to fulfil—nature protection, research, education and promotion of sustainable development, main attention was paid to the last function. The fact that management of biosphere reserves in the Czech Republic is institutionally associated with administration of protected landscape areas allowed us to interpret the role of BR to be promoter of sustainable development in terms of participation of the administration of protected landscape areas in the life of local community. In more practical terms it opened the question on what is the role administration of PLA plays in projects aimed at supporting local socio-economic

development, i.e. in projects primarily not aimed at nature conservation.

The questionnaire survey technique was used to map the opinions of local population related to their everyday life and reveal their attitude to the administration of protected areas and, consequently to nature protection in general. Adult people over 15 permanently living in the model areas formed the basic set. The sample was then derived by use of the combination of quota and random sampling, the quota being based on the size of municipality. Altogether, 1150 respondents were addressed. The share of the sample in the basic set was 1, 86%, which made the sample representative enough for our purposes. Data was processed by use of SPSS 12.01 for Windows and graphical outputs were produced by Excel 2000 for Windows.

3. Results

3.1. Analysis of official statistical data

Analysis of land use was done by use of PCA ordination (Fig. 7). The first two ordination axes (PCA₁ and PCA₂) were used. These axes account for 41% of variability of the data set. Two new parameters were calculated—“degree of

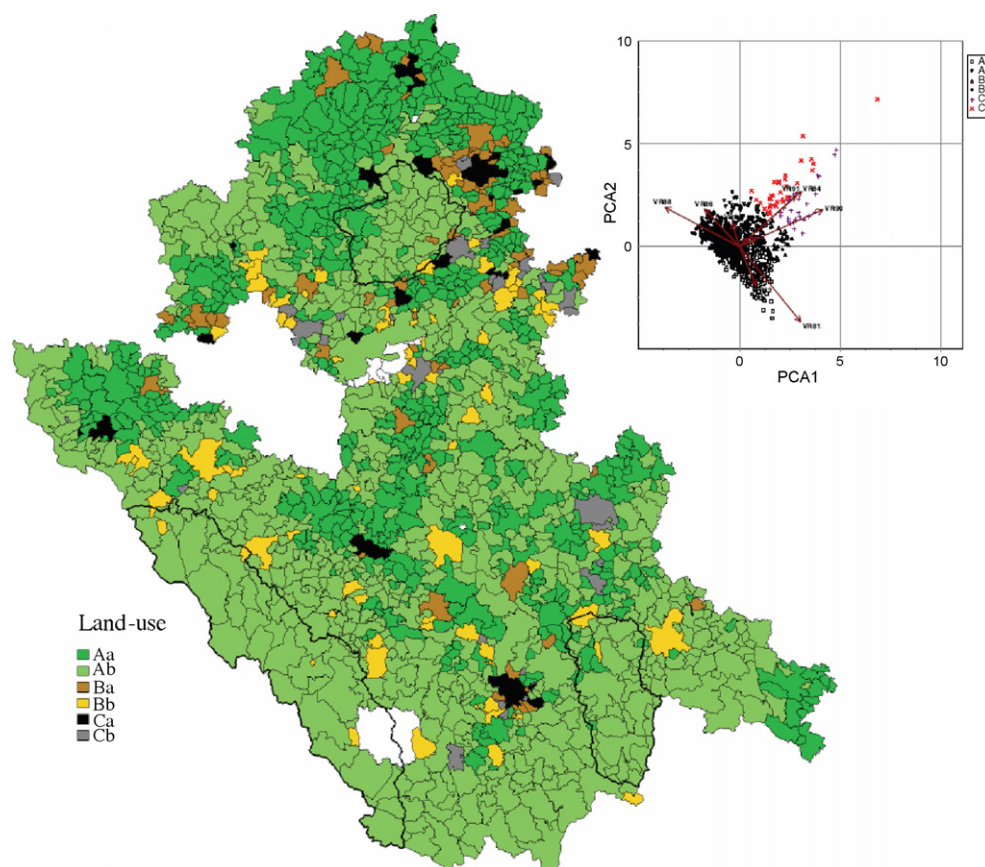


Fig. 7. Classification of municipalities on the basis of principal component analysis (PCA) of land-use data. Combined classes consist of first uppercase character for municipalities within rural landscape (A), intermediate landscape (B) and urbanized landscape (C)—classes are derived from degree of urbanization. Lowercase character represents agricultural land type (a) or forest land type (b). Accompanying figure shows ordination biplot of first two PCA axes based on data (Czech Statistical Institute, municipality statistic database, 2002): share of arable land (vr81), hop gardens (vr82), vineyard (vr83), gardens (vr84), orchards (vr85), grasslands (vr86), forests (vr88), waters (vr89), build-up areas (vr90), other plots (vr91). Not filled units, white colour: Data not available (military training area).

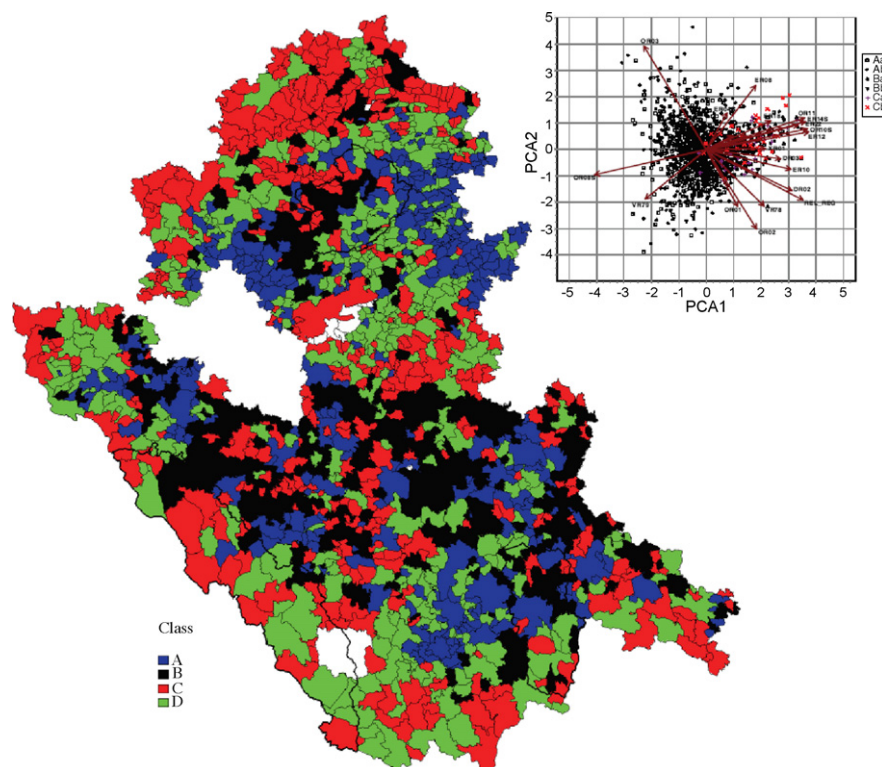


Fig. 8. Classification of municipalities on the basis of principal component analysis (PCA) of socio-economic data. Municipalities are divided into classes A—with standard human population ($PCA_1 \geq 0$, $PCA_2 \geq 0$); B—with aging population ($PCA_1 < 0$, $PCA_2 \geq 0$); C—with young low-qualified population ($PCA_1 < 0$, $PCA_2 < 0$); D—with growing “perspective” population ($PCA_1 \geq 0$, $PCA_2 < 0$). Accompanying figure shows ordination biplot of first two PCA axes based on relative data (original data, Czech Statistical Institute, Census 2001). Calculated out of total number of houses: permanently inhabited houses (dr02), houses owned by physical person (dr03). Calculated out of total population size: number of persons having a car in the family (er04s), having a phone line in a family (er08), having a mobile phone in the family (er10), having phone or mobile in the family (er12), having a personal computer in the family (er14s), with recreational house ownership in the family (er18), with possibility to use some recreational building (er20s), “well appointed” persons (er22), youngs of 0–14 years old (or01), adults (or02), seniors above 64 years old (or03), peoples without secondary level education (or08s), peoples reached second level education (or10s), university graduates (or11), students commuting for a school (xr02). Relative change in inhabitants number per year within period 1960–2000 (REL_REG). Calculated out of adult population size: economically active peoples (vr78), unemployed peoples searching for job (vr79), peoples commuting for a job (xr01), commuting at a long distance—out of the district (xr07s). Not filled units, white colour: data not available (military training area).

urbanization”, $URBA = PCA_1 + PCA_2$ (it describes a gradient from rural to urbanized areas) and “share of agriculture” $AGRI = PCA_1 - PCA_2$ (it quantifies the position on gradient between prevailing forested areas to prevailing agricultural land). An arbitrary division of the space of these variables was used as a basis for municipality classification.

The socio-economic data were processed in an analogical way (Fig. 8). It emerged that almost one third of data variability was described by the first ordination axes (PCA_1), while the second one (PCA_2) accounted for the next 11%. Further decline is smooth and continuous. Two factors proved to become evidently responsible for the position of a municipality in ordination space formed by two first axes—level of education and age structure. It yielded four basic arbitrary classes. The first class can be characterized as “normal” municipalities with population living in relatively well equipped local urban centres. The second one represents municipalities with an aging population, in some case “dying out spots”. In municipalities of the third class live relatively young people. They are, however, not educated and suffer from unemployment. The fourth class is made up of municipalities with young educated and growing population.

As land-use practices differ in individual model areas and in their surroundings, it proved to be incorrect to compare the socio-economic conditions in and out of the model territories directly, but only when they were adjusted to landscape and local environmental features. Comparison without such an adjustment would lead to revealing of differences in natural conditions and type of settlements instead of those in socio-economic milieu.

The relationship between land use and socio-economic parameters was searched for by use of correlations among several first axes for both mentioned PCA ordinations. Thanks to the fact that statistically significant dependence proved to be evident between the first ordination axis of the socio-economic parameters (PCA_1) and degree of urbanization (URBA), it was possible to use, instead of the score of the first ordination axis, the difference between its value and the value expected, which was calculated by use of the following linear regression model (for i th municipality):

$$PCA_{1i} = (a + bURBA_i) + e_i$$

where a and b are regression parameters and e is an error. Differences between real and expected values were then calculated

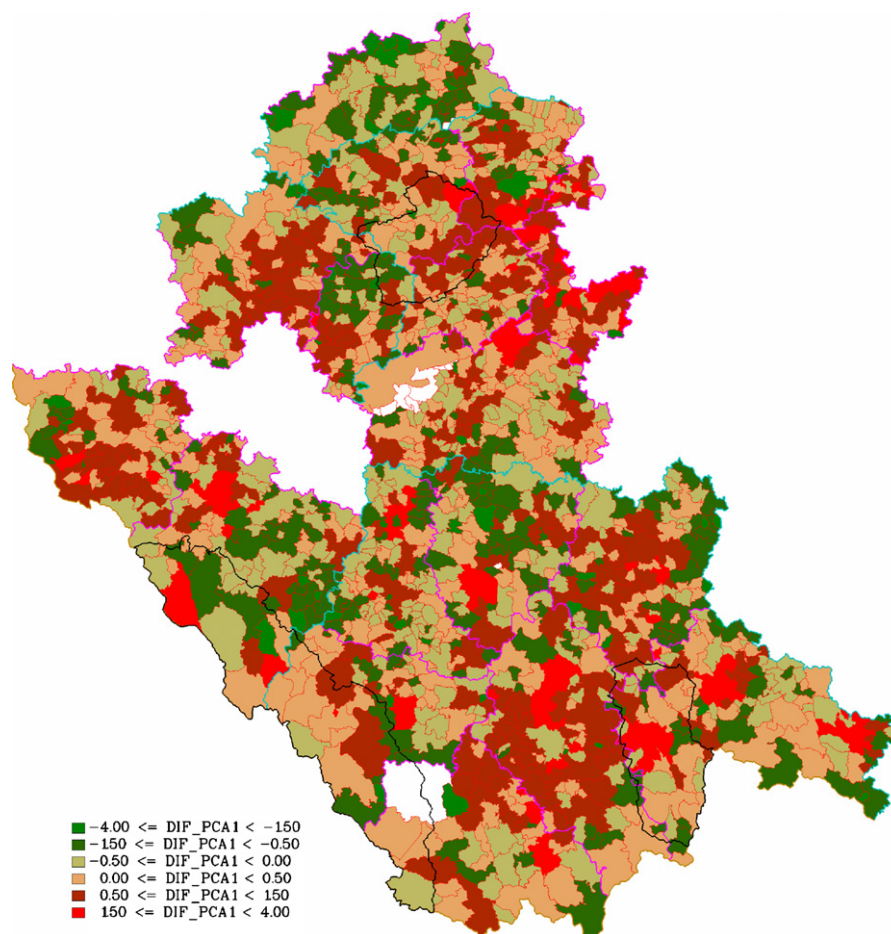


Fig. 9. Classification of municipalities according to normalized socio-economic status. The higher value of DIF_PCA_1 , the better living conditions in a municipality. Not filled units, white colour marked with “x”: data not available (military training areas).

as values of variable

$$DIF_PCA_1 = PCA_1 - (a + bURBA)$$

that we called “normalized socio-economic status” of a municipality. The higher its value, the better living conditions occur in a municipality.

It is fair to state, however, that the normalized socio-economic status could be calculated only when two principal presumptions had been taken into account. We presumed that land-use types were related to the nature conditions of a particular locality and the character of a municipality (formed by prevailing economic activity in both contemporary and historical perspectives), and that the socio-economic conditions were influenced by land-use practices.

Values of the variable DIF_PCA_1 were calculated for all the municipalities forming our broader model areas (lying either inside of a protected area or in its surrounding made of a 20-km zone). The difference between values assigned to municipalities inside the protected areas and those lying outside was tested by *F*-test in analysis of variance with a three-level factor: municipalities within the protected area (group A), on the border of this area (group B) and placed completely outside the protected area (group C). The difference proved to be statistically insignificant. Based on this we can conclude that protected areas do not dif-

fer from the “normal” surrounding areas as to socio-economic conditions, at least those described by the first ordination axes (Fig. 9).

3.2. Content analysis of regional periodicals

In the family of mass media, press belongs to the veterans. However, in spite of the current development of new media it is still considered to be a very important and frequently used source of information (Blažek, 1998). It evidently plays this role in the monitored protected areas, as can be seen in Fig. 10 which is based on results of questionnaire survey. Television, newspapers, friends, acquaintances and information materials are the most frequently used information sources telling local people what is going on in the PLA.

During the period of interest, 550 relevant records were found in the surveyed newspapers. The distribution of records concerning particular areas was uneven. The frequency of the problems related to the Šumava was approximately five times higher in comparison with Křivoklátsko and Třeboňsko (Fig. 11). Let us reconsider the initial assumption that the press always reflects the expected interest of the public in the given topic. Already the number of articles itself can be an indicator of its medial attractiveness (e.g. MacLuhan, 1991). From this view-

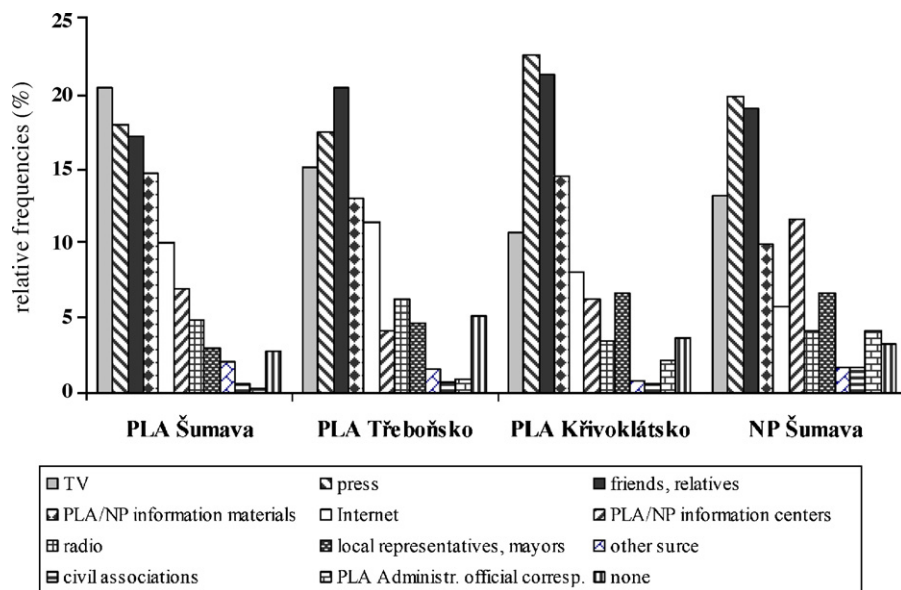


Fig. 10. Sources of information on events happening in the PLA/NP.

point, Třeboňsko and Křivoklátsko can be seen as areas where the problems of nature protection do not stir public opinion. This view is supported by the content analysis of the articles, which documents that the “conflicts” between nature protection and communities usually belong to the sphere of the routine administrative agenda. On no account they do have the character of a “fatal” problem, considering any of the parties involved. This can be applied to both areas, though in Třeboňsko the overall situation is more complicated due to the existence of problems connected with the operation of local production branches and related entrepreneurial activities. In both areas, the image presented in the press includes more examples of successful cooperation between nature protection authorities and the communities. Articles in the periodicals praised the PLA administration for their educational activities, e.g. constructing educational paths and cycling tracks, and operation of information centres. Other articles demonstrated the common interest of the communities and nature protection bodies in local development, e.g. joint application for subsidies to be used for the construction of a sewage treatment plants and communal gas service in particular localities. If we were to formulate a hypothesis summarizing the situation, we could probably say that in the course of the previous

almost 30 years, “both the systems gradually got accustomed to each other”.

In this respect, Šumava is different from the areas dealt with above. Due to the relatively short existence of the Šumava National Park, whose activities overlap with the PLA activities, the chance to state that this area is free from conflicts is very low. On the contrary, the consensus between the Šumava NP and the communities is hindered by a large number of conflicts. Some of them can be seen as general (e.g. the dispute concerning historical property of the communities in the area of the Park, zoning, comments on the management plan, solutions to bark beetle problems—in detail see, e.g. Mentberger, 2006), whereas other ones are related to concrete localities (e.g. the dispute about the construction of downhill skiing track at Smrčina Mt. or about the use of Boletice military area). In this case, the conflicts can be considered “fatal”. The decision of one party in a dispute can have serious consequences for the other party involved. That is why the relationships are tenser.

However, here too the points of view are gradually converging. The NP and PLA administrations seem to realize that their main role does not consist only in the protection of unique natural heritage but also in supporting the potential which brings the communities good quality life and sustainable development. Apart from a large number of problems, the daily newspapers also published articles presenting successful cooperation between nature protection authorities and communities. They were less frequent but they can be perceived as a manifestation of common interest in the advancement of the area, mostly in the form of improvement of tourism-related facilities. Concrete examples are, e.g. the maintenance of cross-country ski tracks, routes of ecological buses, repair of landmarks like open-air shrines and memorial stones, building information centres. Thus the above-mentioned hypothesis could be slightly reformulated into the form of a question: “How much time is needed for both systems to get used to each other?” Maybe in 30 years’ time

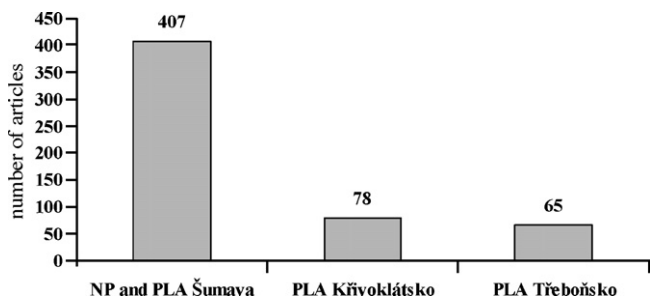


Fig. 11. Number of articles matching the key words (period 1998–2004).

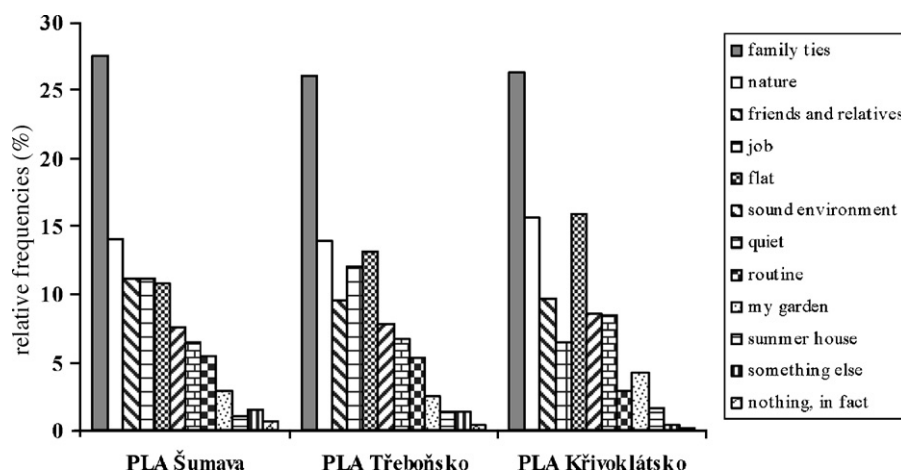


Fig. 12. Ties to the territory.

Šumava will be presented in press in a way resembling the current articles on Křivoklátsko and Třeboňsko—very much like an “idyll”.

3.3. Interviewing and questionnaire survey

There was general agreement among the interviewed key personalities that, at least theoretically, active involvement of state nature protection bodies in projects beneficial to the public seems to be the most efficient way of changing the image of nature protection in eyes of local people. Such an approach refers to a principle of a gesture symbolizing a social status that does not need to be based exclusively on execution of power or manifestation of wealth, but also on a ritualised prestige (Bourdieu and Passeron, 1977).

However, there is still a gap between the theory and the practice in this respect. To describe present situation, we must admit, that administrations of our protected areas participated only indirectly in projects aimed at local socio-economic development. As a rule it was in the phase of a project preparation when administration delivered expert knowledge informing applicant about principle features of the territory; state nature protection body as well supported these projects by formulating positive references addressed to a pertinent grant agency. Direct active involvement of nature protection bodies in these projects, however, proved to be rather problematic, main constraints being incompatibility of the concept of biosphere reserve with Czech environmental legislation—biosphere reserves are not recognized as a legal category for protected areas. Protected landscape areas which biosphere reserves are associated with are designed to execute nature protection, and support research and education, they do not count with active promotion of sustainable development. As a result representatives of protected landscape areas refused to be engaged with these projects. They, as representatives of state administration, were afraid of being accused of conflict of interests as they were party to a process of projects approval (Těšitel et al., 2006a,b).

The analysis of behavioural patterns of individual stakeholders revealed, among others, that decision sphere in nature

protection often used a cliché of conflict as a routine even though there often were no reasons for it. The contradiction was simply taken for granted. To introduce at least one practical example, we would use the seminar organized by the Czech Ministry of Environment in autumn 2004. The issue to be discussed was a relationship between nature protection and local socio-economic development. The point was that organizers, representing official position of the top administrative body of nature protection, titled this event by use of the word “contra”—“Nature protection contra socio-economic development of local communities”. As a result, notion of conflict was introduced at the very outset between representatives of nature protection and local mayors participating in the seminar (Těšitel et al., 2005a,b).

When analysing the behaviour of local people and their attitude to the locality they live in, including its nature quality, level of their “rooting” proved to be one of key determinants. Viewed from this perspective, people who live in our model areas can be characterized as members of a stabilized population. They seem to be deeply rooted in the territory, most of them have been living there for a long time, or they were even born there. Besides their affinity to nature, it is primarily social relations that make them feel tied to the locality—family, friends, job opportunities, flat and ownership of real estate. After all, the majority of them do not have to commute for a job or school out of the model area. They do not want to move out of the territory at all (Figs. 12 and 13).

The perception of the present socio-economic situation as it is viewed by locals does not differ from the picture drawn by

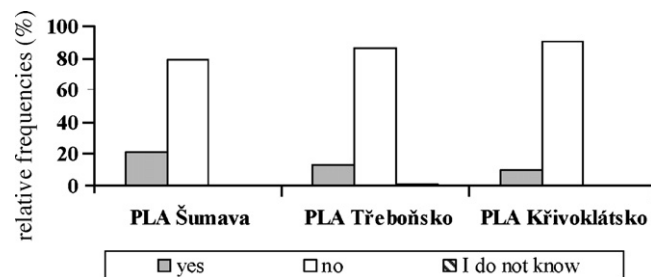


Fig. 13. Intention to leave the territory.

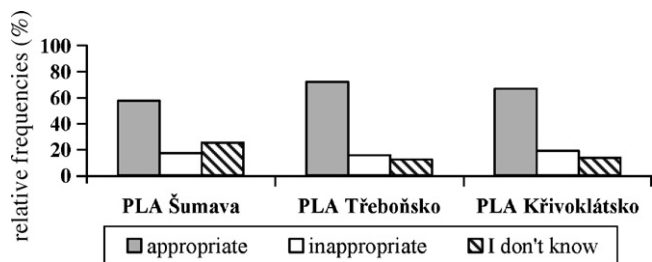


Fig. 14. Quality of services and infrastructure related to scale of municipality.

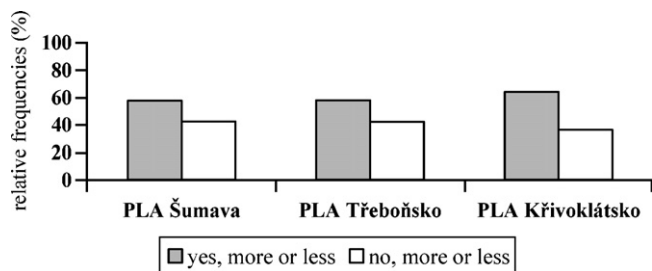


Fig. 15. Contentment with personal economic situation.

official statistical data. When evaluating the quality of facilities in their municipalities, most of them have been convinced that available services as well as infrastructure are appropriate in the sense that they reflect the size of a particular municipality and its history. As to their own current economic situation, the majority of inhabitants seem to be content with it (Figs. 14 and 15).

Their everyday life does not seem to be much influenced by the fact that they live in a protected area. In fact, only a minority of inhabitants has encountered representatives of the protected landscape area administration in person; they are as a rule those who have had to deal with some legal or bureaucratic procedures in which the administration of PLA participates. On the other hand, most people living in the area use some facilities run by the administration, and participate in voluntary activities related to nature protection. They also highly appreciate the fact that the “label” of a protected area increases tourist attractiveness of the whole territory (Figs. 16 and 17).

To sum up, it is possible to state that people living in the three protected areas do not feel handicapped in the socio-economic sense. As to their relationship to nature protection, they perceive it in a “peaceful way”; in some cases they even have been able to find a way how to make some kind of profit from it. The relatively “peaceful” coexistence is primarily based on the fact that representatives of the municipalities as well as the administration of

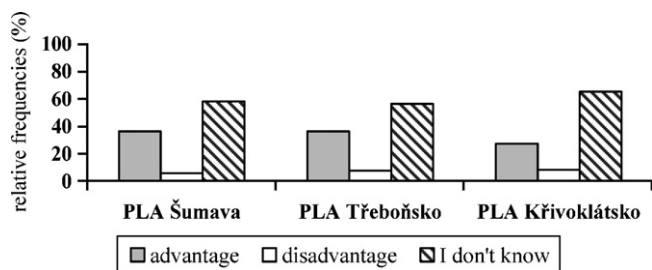


Fig. 16. Role of PLA in regional development as it is perceived by local people.

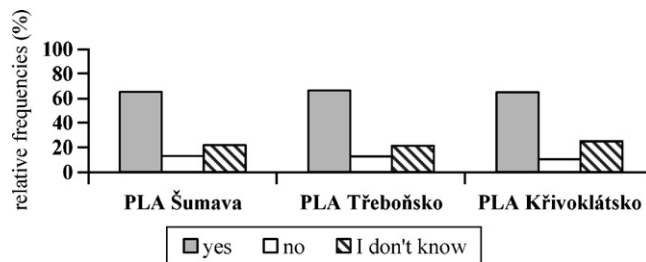


Fig. 17. Does PLA increase tourist attractiveness of the region?

protected areas had a time to overcome the initial contradiction, evident when protected areas had been established, and have come to the point of building a joint vision of future coexistence. Sustainable tourism, as an activity acceptable by both parties, seems to have become the key point of the above-mentioned common vision.

4. Discussion and conclusion

4.1. Triangulation approach

The main advantage of triangulation approach lies in its ability to depict multifaceted picture of a reality at hand by use of particular research techniques. In order to make a coherent picture, these techniques were not applied in isolated way which would make them being independent from each other. Step by step process was used instead, which made individual techniques to complement each other. We started with the description of the medial image. On this basis, structure of questionnaire was refined as well as the structure of semi-standardized interview. Analysis of statistical data, in this respect, was the most independent part of the research, being however as well structured by the general scheme of the concept of quality of life.

In the end, the final mosaic was rather complex. Picture about quality of life in biosphere reserves drawn by use of objective statistical data did not differ from that we got when analysing the data gained by questionnaire survey. Both views, objective and subjective, overlap to a great extent. Sustainable tourism as the most promising factor local development should be based on appear as an output of content analysis of media, questionnaire survey as well as key informant interviewing. While all the three model areas appeared to be similar in most aspects studied by the above-mentioned methods, content analysis revealed fundamental differences between Šumava BR and the remaining two model areas. It introduced a question of time necessary to reconcile local economic activities with nature protection. Interviews yielded information which could not be substituted by any other applied method, information on behavioural strategies of individual stakeholders and on problems related to institutional setting of biosphere reserve.

4.2. Achieved results

Based on the analysis both of objective data and subjective reflection of the situation by local population we can generally conclude, that protected areas should not be seen as territories

handicapped a priori. There is no statistically significant difference between protected areas and their surroundings in terms of objectively measured parameters describing material well-being. Nor the inhabitants of protected areas feel themselves handicapped.

Natural capital in terms of “certified” nature, such as biosphere reserve, plays an ambivalent role. The status of being protected can be seen simultaneously both as limitation and comparative advantage. On one hand, nature protection really poses limits to some economic activities as to their type, intensity or localization concerns. On the other hand, thanks to the state policy of nature protection and regional development policy, such regions are eligible for special funds which cannot be applied for by other regions (e.g. Bartoš et al., 1998). The success in such a trade-off depends on many factors, including local personalities and their activities. Anyhow, this ambiguity challenges the generally spread cliché considering protected areas as ones being handicapped a priori (e.g. Zemek and Heřman, 1998; Bartoš et al., 2005; Zemek et al., 2005).

“Sound environment” and “well-preserved nature” can be considered as two principal attributes of the territory. To some extent they affect behavioural patterns of both local population and visitors.

Let us mention the visitors first. Here the attributes in question represent the most important attractor for them to come. The present-day popularity of areas attributed high quality of environment can be partly related to the need of modern people to live, or at least to relax, within relatively unspoiled landscape, which is often explained by human phylogenetic attachments to nature (see, e.g. Oriens, 1980; Wilson, 1984). This theme has also been taken up in the Czech professional literature, and in some studies aimed at explaining our desire for outdoor recreation (Honzík, 1965; Librová, 1987, 1988; Maršálková and Todlová, 1983), where home and countryside have been separated by urban expansion. The ‘escape from the city’ (Honzík, 1965) has now been a phenomenon for several decades, as the constraints of time, money and transport have been relaxed, whilst expanding urban areas have meant that people have had to travel further to escape city life. This has created situations in which more people seek unspoiled landscape settings within a diminishing rural area. This imbalance seems to result, at least in Czech conditions, in the increasing importance of preserved areas as a recreational hinterland for towns (Librová, 1987, 1988). Recognition of biosphere reserves as tourist destinations means in fact setting them into the context of the nation-wide or international market by use of which the internal potential of biosphere reserves can be commodified.

Assessing the role of these attributes from the inside of the biosphere reserve, they seem to considerably contribute to the stability of local population as they represent one of the dominating attachments binding inhabitants to the territory (see Fig. 12). Furthermore, they were recognized as comparative advantage for further socio-economic development as well. In all the model areas there is a commonly shared positive opinion among people as to the role of protected (and certified) environment in tourism development (Fig. 17). The “tourist” potential is perceived as not fully exploited yet (see Fig. 18). Once we agree

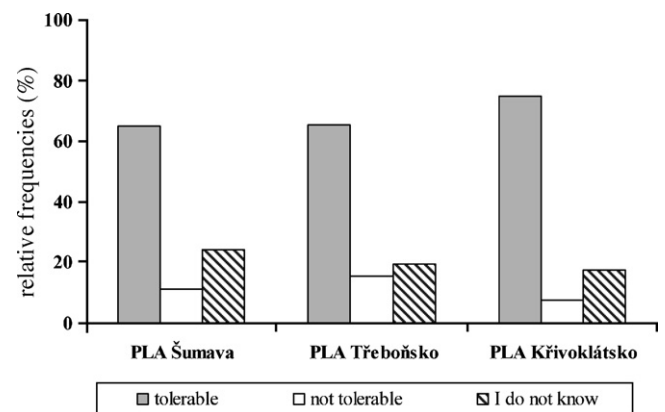


Fig. 18. Number of tourists in the region as it is perceived by local people.

with local key personalities and assume that sustainable tourism can be considered the base of the local economy in protected areas, we can go even further in our defence of nature protection measures. As sustainable tourism can be characterized as small-scale, decentralized, friendly to the natural as well as the cultural environment, and based on active participation of locals, as an economic activity it is based on the commodification of natural as well as cultural capital of the particular locality or region (Jenkins, 2001; Kušová et al., 2002; Ira, 2005; Nolte, 2005). Based on this premise we can formulate a theoretical statement, to some extent paradoxical, that nature protection can play a role of a guardian of long-term economic development as it promotes this comparative advantage of an area (e.g. Vos and Klijn, 2000). It can be seen as a good message for our biosphere reserves in the effort to achieve one of their missions, the one aimed at promoting sustainable development on their territory.

However, there are also some constraints hindering more effective utilization of high quality nature for local development. Among others, deeper involvement of state nature protection bodies in promotion of sustainable development in protected areas is missing, though these areas have a status of biosphere reserve. There are in fact two constraints that seem to be of crucial importance. Only partial compatibility between the Czech environmental legislation and the concept of biosphere reserve is the first one. Solving this problem lies beyond the power of any individual protected landscape area; the question should be raised towards the Czech Ministry of Environment. The other constraint can be interpreted in terms of traditionally defensive strategy towards any potential economic activity adopted by the state nature protection that relies still predominantly on restrictions rather than on incentives (similar result see, e.g. Jeník, 2006).

Summed up, quality of life did not seem to be much affected by the fact that people lived in protected areas, however full harmonization of biodiversity protection and socio-economic development was hindered by constraints of formal and legislative nature.

At the very end it is fair to point out that, despite the fact that the particular protected areas differ from each other, all of them are embedded in a very similar regional context. The nation-wide analysis of the current socio-economic situation proved that all

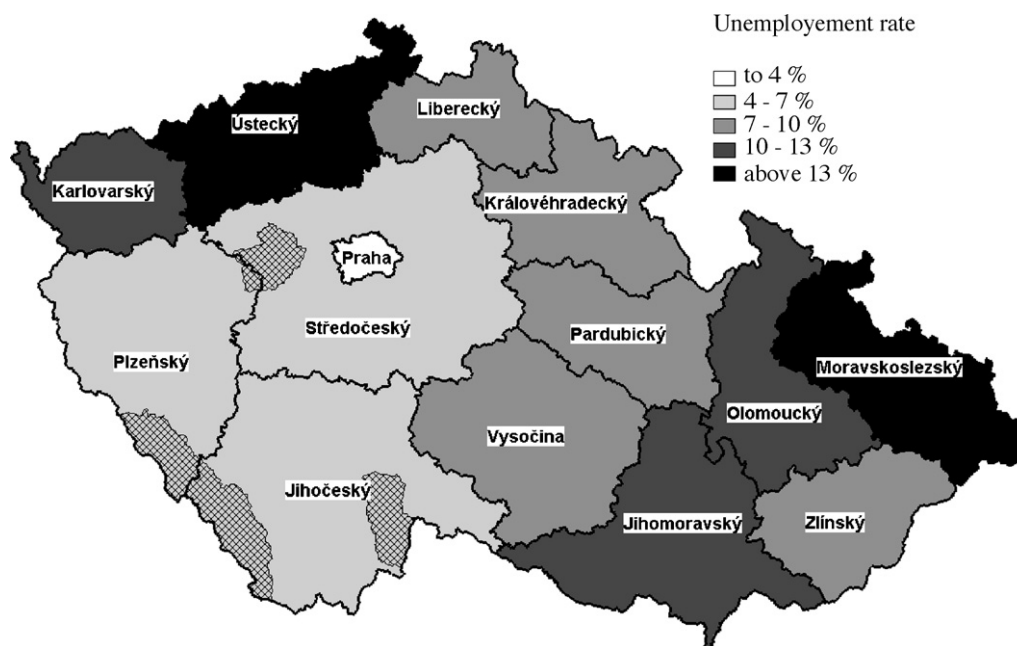


Fig. 19. Regional distribution of unemployment—Czech Republic, 31-12-2004 (source: Ministry of Labour and Social Affairs of the Czech Republic).

our protected areas are situated in the regions where serious social conflicts are not present (Fig. 19). This is mainly thanks to the relatively low unemployment rate occurring there (see statistics on web-side of the Ministry of Labour and Social Affairs of the Czech Republic (<http://portal.mpsv.cz/sz/stat>). Therefore, we should be cautious when trying to generalize project results and apply them to all Czech protected areas. In order to get more general outputs it would be necessary in next steps to include protected areas situated in economically more problematic regions in our research.

The methodology is currently being applied at an international scale with the aim to test the concept of BR as a platform of communication between nature protection bodies and local populations in the Biosphere Reserves of Babia Gora (Poland), Agtelek (Hungary) and the Tatras (Slovakia).

Acknowledgements

The study was based on the following research projects: participative management of protected areas—a key to minimization of conflicts between biodiversity protection and socio-economic development of local communities (VaV 610/3/03), funded by the Ministry of Environment CR (<http://www.infodatasys.cz>); research project of the Institute of Systems Biology and Ecology AS CR, v.v.i. – AV0Z60870520 – Spatial and functional dynamics of biological, ecological and socio-economic systems in interaction with the global change of climate (<http://www.usbe.cas.cz>); conservation and sustainable use of biodiversity through sound tourism development in biosphere reserves in Central and Eastern Europe. Grant United Nations Environment Programme, Global Environment Facility Medium Sized Project, GFL/2328-2714-4829, PMS: GF/4020-05-01 (<http://www.tourism4nature.org>); PANet 2010-Protected areas network-Establishment and Management of

Corridors, Networks and Cooperation. INTRREG IIIB CAD-SES (<http://www.panet2010.info>).

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