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Protected landscape areas and regional development (the case of the Czech Republic)

Abstract: The focal point of this article is to discuss whether or not, or to which extent, nature protection can be considered a factor differentiating the level or speed of regional socio-economic development. We decided to use empirical evidence in order to test the historical belief that nature protection poses limits to economic development that may lead to stagnation if not decline in areas where it is applied. We used three large-scale Czech protected areas and tested the hypothesis saying that areas under special regime of management due to nature protection suffer from economic underdevelopment. Based on the analysis both of objective data and subjective reflection of the situation by local population we can conclude that protected areas should not be seen as territories a priori handicapped.

Key words: Protected landscape area, nature protection, regional development

Introduction

Several theories of regional development have been invented during the course of history. It is fair to state, however, that the set of regional development theories is conceptually incoherent, which leads to the situation in which their basic presumptions are often contradictory. As a result they can be classified by use of various viewpoints. Even if we take into account that it is not the only criterion, the theories of regional development are, as a rule, divided into two classes according to the type of processes seen as dominating in the development of regions, either convergent, in theories of regional equilibrium, or divergent, in theories of regional disequilibrium (e.g. Blažek, 1999, Blažek *et al.*, 2002). In both cases we encounter the term of unevenness, and the two classes of theories interpret regional development in terms of the decrease or increase of unevenness. The difference between the two types of theories is a relative one to some extent as it mostly depends on definition of spatial scale and/or time horizon, which a particular theory considers. As an example of relativity, Hampl's theory

of hierarchy of reality can be used. It points out the process of permanent creation of new points of differentiation while the older differences among regions are being diminished due to the process of diffusion (Hampl, 1988a, b).

Besides describing the unevenness among regions, one of main efforts of regional development theories seems to be the explanation of the driving forces that may lead to differentiation among particular region during the course of their historical development. According to the generally accepted scheme, two conditions should be met in order for a certain level of development to be achieved in a particular region. It is natural, social and cultural capital representing the internal potential of particular region. Such a potential, however, can be converted to the developmental impetus only when it meets appropriate external context that represents the other presumption necessary (Bartoš *et al.* 1998; Kušová *et al.* 1999; Těšitel *et al.* 1999).

The focal point of this article is to discus whether or not, or to which extent, nature protection can be considered a factor differentiating the level or speed of regional socio-economic development. Discussion of this kind seems to be legitimate, as there is historically inherited belief among experts as well as general public that nature protection is one of driving forces that may cause regions to become economically marginal. In other words, nature protection measures are considered primarily in terms of limits posed on socio-economic development of particular region or locality rather than to be perceived as comparative advantage of some kind, or at least in a neutral way. Contradiction between nature protection and socio-economic development has been articulated in many ways, explicitly or implicitly, spreading from ethical arguments to very pragmatic ones. "When we choose between feeding the hunger and conserving nature, people ought to come first" – represents the most extreme formulation of the problem. This pinpoints the ethical issue, pure and simple, and often one, where humanist protagonists, taking moral ground, intends to put environmentalists on the defensive (Rolston 1997). They are not only humanists or developers, however, who view the relation in terms of contradiction. The contradiction is sometimes taking as granted also by people whose profession is to conserve nature. To introduce at least one practical example of what has been said above, we would use the seminar organised by the Czech Ministry of Environment in autumn 2004[1]. The issue to be discussed was the relation between nature protection and local socio-economic development. The point was that organisers, representing official position of the top administrative body of nature protection, titled this event by use of the word "against": "Nature protection against socio--economic development of local communities". As a result, the notion of conflict was introduced at the very outset between the representatives of nature protection and local mayors participating in the seminar.

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[1] The seminar was an event acompanying the film festival „Ekofilm". The festival is devoted to problems of environment and is annually organised in the towns of České Budějovice and Český Krumlov.

Still, there have been some signals making us more optimistic as to the interpretation of the role of nature protection in regional development. Positive aspects are even embedded in the two above-mentioned examples. Rolston titled his article with the question mark at the end, "Feeding people versus saving nature?", and the whole text of the article aimed at questioning of the contradiction. And as to the seminar, the participants themselves reformulated the title to the neutral form by use of "and" instead of "against": "Nature protection and socio-economic development of local communities".

We followed this line and decided to use empirical evidence in order to test the above mentioned historical belief that nature protection poses limits to economic development that may lead to stagnation if not decline in areas where it is applied. To do that, we used three Czech large scale protected areas and tested the hypothesis saying that areas being under special regime of management due to nature protection suffer from economic underdevelopment.

## Model areas and methods used

Model areas

Within the project, whose results are reported here[2], relevant data were collected in three model areas, the Protected landscape areas (PLA) of Šumava, Třeboňsko and Křivoklátsko (Figure 1). For purposes of some analyses, model areas were extended to include also municipalities that form what we called the "surroundings" of model areas. It consisted of a strip around the protected areas studied having the width of 20 km. The municipalities of interest formed then three groups – lying completely within the protected areas (group A); intersected by the borders of the protected areas (group B); and those lying completely out of the protected areas (group C).

Protected landscape areas of our interest were, owing to their uniqueness, also recognised internationally as biosphere reserves. They differ from each other both as to their natural parameters and historically determined socio-economic conditions, forming thus broad scope of aspects to be taken in to account when assessing mutual relation between nature protection and local and regional socio-economic development.

Methodology

A double perspective can in principle be applied when discussing social unevenness in general – the objective and the subjective one. 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,

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[2] Project titled "Participative management of protected areas – a key to minimize conflict between biodiversity protection and socio-economic development of local communities" of the Czech Ministry of Environment. More detailed information can be found on http://www.infodatasys.cz/
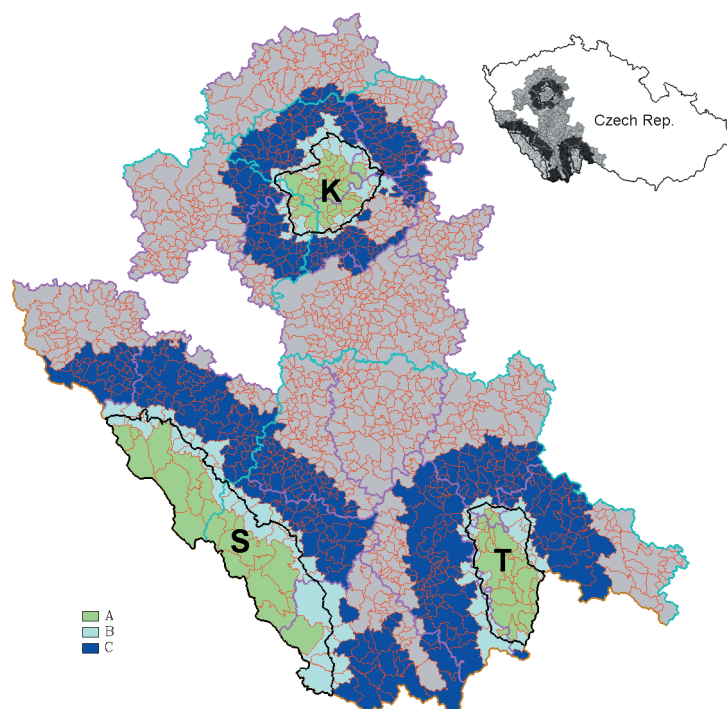
Figure 1. Model areas. Explanatory note: K Protected landscape area of Křivoklátsko; S Protected landscape area of Šumava; T Protected landscape area of Třeboňsko; A municipalities located within the model areas; B municipalities on the border; C municipalities of the surroundings; Black lines – borders of protected areas

as there are not only individual people but whole regions that can be considered rich or poor (Mareš 1999).

Different approaches exist in pertinent professional literature to objective measurement of unevenness between regions by use of objective statistical data. In order to identify poor regions in 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. Analogously, Jarman (1984) designs the score of underprivileged regions by assigning individual indicators of deprivation their specific weights. In our project we dealt with the question whether areas under special regime of management due to nature protection differ significantly from the surrounding areas as to the socio-economic milieu. Two sets of objective data describing the three landscape protected areas as well as their surrounding were used, provided by the Czech Statistical Institute. The first set consisted of ten variables describing land use type, expressed in terms of shares of particular land-use categories within the basic statistical units. The other set characterised the socio-economic milieu on the territory using basic demographic data, data describing material well being of inhabitants as well as data on availability of infrastructure and services. All the data referred to municipality as the basic sta-

tistical unit. Twenty-two relative socio-economic characteristics were derived in order to enable comparison among units of different extent. Individual municipalities were twice processed using the principal component analysis (PCA) – according to the data on land use and according to the relative socio-economic parameters. Based on results of both PCAs a new parameter, the "normalised socio-economic status" of municipalities was derived. It was used to test the differences between the protected landscape areas and their surroundings. All results were visualised by means of GIS technology.

In order to obtain information on how people subjectively reflect their current socio-economic situation, as well as on what is their relation to nature protection, an interviewing technique and extensive questionnaire survey were applied in all the three model areas. Twenty key respondents were addressed using a semi-standardised interview. The respondents were the representatives of nature protection, mayors of local municipalities and experts in relevant field of knowledge. The questionnaire survey technique was used to map opinions of the „normal" population as to everyday life. Adult people, older than fifteen, permanently living in the model areas, made up the basic set. The sample was derived by the use of combination of quota and random sampling, the quota corresponding to the size of residential municipality. Altogether, 1,150 respondents were addressed. The share of the sample in the basic set was 1.86%, which made the sample representative enough for our purposes.

Results and discussion

Objective perspective

Both PCA ranks of municipalities led to their arbitrary classification (Figure 2 and Figure 3).

Analysis of land-use was done using PCA (Figure 2). The first two axes (PCA_1 and PCA_2) were used to classify municipalities. These axes explain 41% of data variability. The first classification (according to the variable URBA = PCA_1 + PCA_2, which we called "degree of urbanisation") followed the gradient of the level of urbanisation (from rural to urbanised areas), while the other (orthogonal variable AGRI = PCA_1 − PCA_2, which we called "share of agriculture") goes along the gradient characterising the share of agriculture in land use (from prevailing forested areas to prevailing agricultural land).

Analogously the socio-economic data were processed (Figure 3). It proved that almost one third of data variability was described by the first component (PCA_1), while the second one (PCA_2) allows for eleven following per cent. Further decline is smooth and continuous. Two factors proved to be evidently responsible for a position of municipality in PCA space formed by two first axes – level of education and age structure. This yielded four basic arbitrary classes. The first class can be said to contain "normal" municipalities with population living in local urban centres, relatively well equipped. The second one repre-
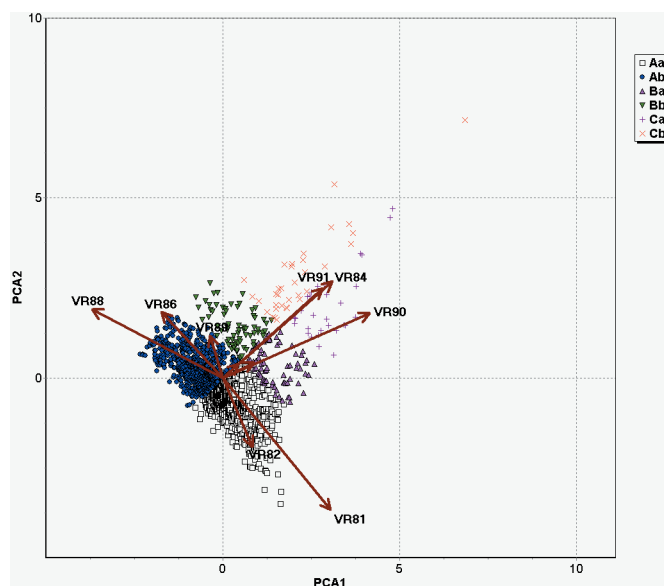
Figure 2. Classification of municipalities according to land use types.
Explanatory note: Fig. 2a) Positions of individual variables in the space of the first and second PCA components. Variables: vr81 – share of arable land; vr82 – share of hop gardens; vr83 – share of vineyards; vr84 – share of gardens; vr85 – share of orchards; vr86 – share of permanent grasslands; vr88 – share of forests; vr89 – share of water bodies; vr90 – share of built-up areas; vr91 – share of other land use types
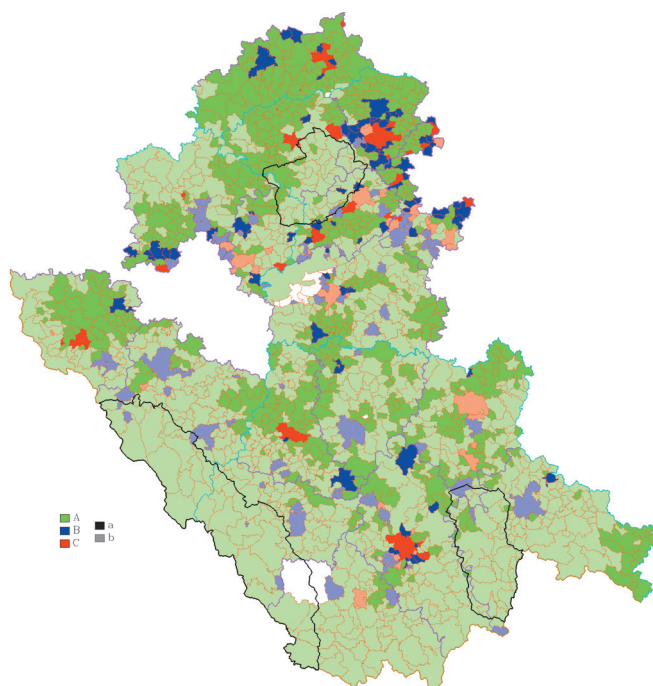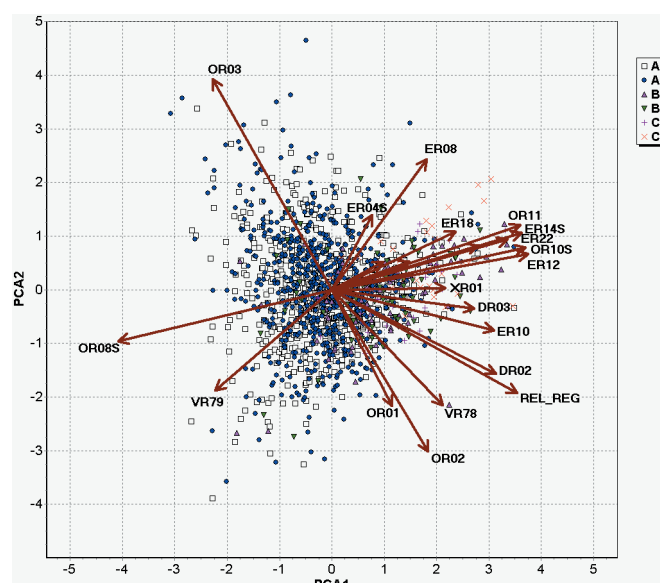

Fig. 2b) Combined classes of municipalities: According to the first principal component (color): A rural landscape; B intermediate; C urbanized landscape; According to the second principal component (shading): a agricultural land prevails; b forested land prevails. Not filled units – white color: Data not available (military training area)

Figure 3. Classification of municipalities according to socio-economic parameters
Explanatory note: Fig 3a) Position of individual variables in the space of the first and second
PCA components. Variables that describe: Out of the total number of houses: dr02 – share of
the permanently inhabited houses; dr03 – share of houses owned by physical persons;
Shares in the total number of population of persons, who: er04s - have a car in the family;
er08 – have a phone line in the family; er10 – have a mobile phone in the family; er12 – have
either stationary or mobile phone in the family; er14s – have a personal computer in the fam-
ily; er18 – whose family owns a recreational house; er20s – can use some recreational build-
ing; er22 – are "well appointed"; or01 – are young (0–14 years); or02 – are adult
(15–64 years); or03 – are elderly (above 64 years); or08s – do not have secondary educa-
tion; or10s – reached the secondary education; or11 – are university graduates; xr02 – are
students commuting to a school; and: REL_REG – relative change in inhabitants number per
year (within period 1960–2000);
Out of the total adult population: vr78 – share of economically active persons; vr79 – share of
unemployed people searching for job; xr01 – share of people commuting to a job;
xr07s – share of persons commuting over long distances (out of the district).

sents municipalities with ageing population, in some cases the "dying out
spots". In municipalities of the third class relatively young people live. They are,
however, not educated and suffer from unemployment. The fourth class is made
of municipalities with the young, educated and growing population.

As land use practices differ in individual model areas and in their surroundings,
it proved not to be correct to compare socio-economic conditions of the model
territories directly, but only after they have been adjusted for landscape and
local environmental features. Comparison without such an adjustment would
rather lead to revealing the differences in natural conditions and type of settle-
ments instead of those in socio-economic milieu.

The relation between land-use and socio-economic parameters was analysed
using correlation among several principal axes for both mentioned PCAs.
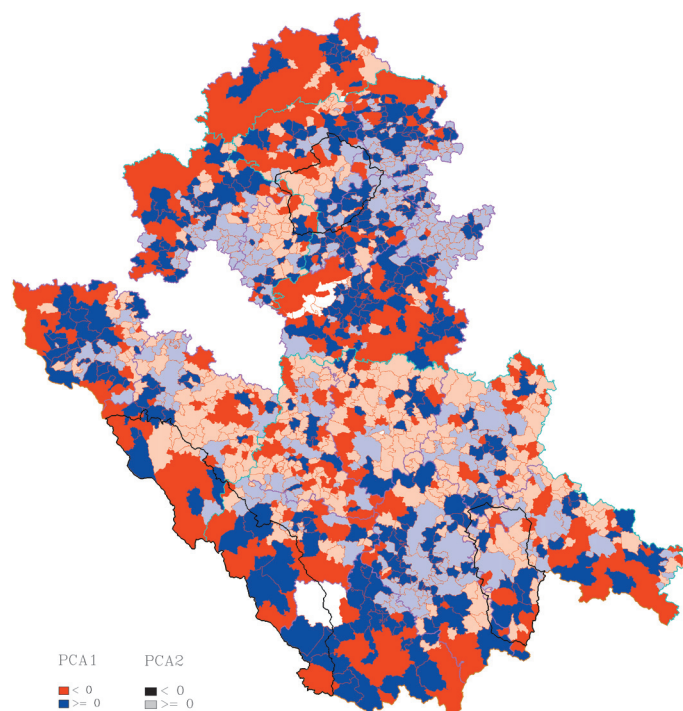Thanks to the fact that statistically significant dependence existed between the

Fig 3b) Classes of municipalities: PCA1 = 0, PCA2 = 0 "normal" municipalities; PCA1 < 0, PCA2 = 0 "ageing" municipalities; PCA1 < 0, PCA2 < 0 municipalities with young but nor qualified population; PCA1 = 0, PCA2 < 0 "perspective" municipalities. Not filled units – white color: Data not available (military training area)

first axis of socio-economic parameters (PCA1) and the degree of urbanisation (URBA), it was possible to use, instead of the score on the first component, the difference between its value and value expected, which was calculated by use of the following linear regression model (for i^{th} municipality):

$$PCA1_i = (a + b \ URBA_i) + e_i$$

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

$$DIF\_PCA1 = PCA1 - (a + b \ URBA)$$

which we called the "normalised socio-economic status" of municipality. The higher is its value, the better living conditions occur in a municipality.

It is fair to state, however, that the normalised socio-economic status could be calculated only when two essential assumptions had been taken into account. We assumed that land-use types were related to natural conditions of a particular locality and to the character of municipality (formed by prevailing economical activity, both currently and in history), and that socio-economic conditions were influenced by land-use practices.

The values of the variable DIF_PCA1 were calculated for all the municipalities forming our broader model areas (lying either inside of protected area or in its

surrounding). Difference between values assigned to municipalities inside the protected areas and those lying outside, was tested by use of F-test in analysis of variance with three-level factor: municipalities within protected area (group A), on the border of this area (group B) and lying completely out of protected area (group C). The difference proved not to be statistically significant. Based on this we can conclude that protected areas do not differ from the "normal" surrounding areas as to socio-economic conditions concerns, at least those described by the first PCA axes (Figure 4).
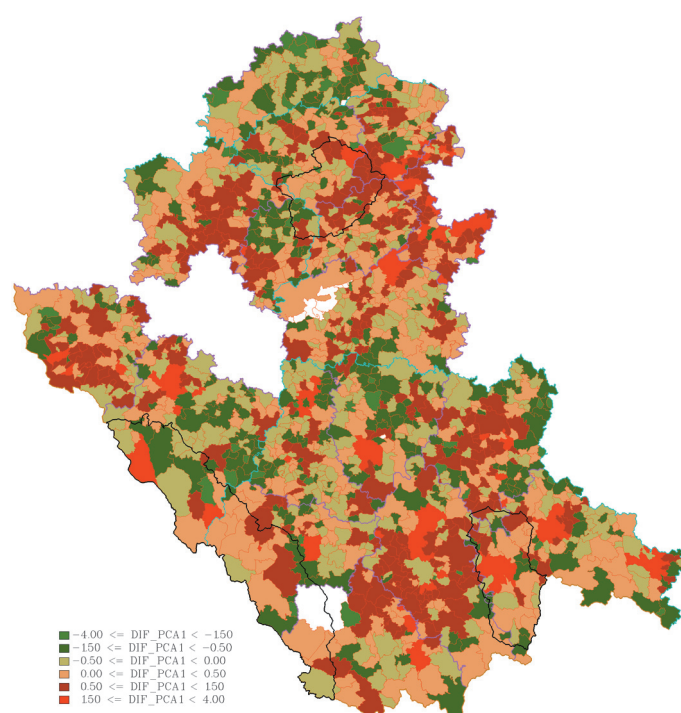
Figure 4. Classification of municipalities according to normalized socio-economic status. Explanatory note: The higher the value of DIF_PCA1, the better the relative living conditions in a municipality. Not filled units – white color: Data not available (military training area)

Subjective perception

Reflection of the present socio-economic situation, as provided by the locals does not differ from the picture drawn using official statistical data. People who live in our model areas can be characterised as members of a stable 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 affinity to nature, it is primarily social relations that make them feel tied to the locality – family, friends, job opportunities, flat and ownership of private property. The majority of them need not commute for a job or school out of the model area. They do not want to move out of the territory at all (Figure 5 and Figure 6).
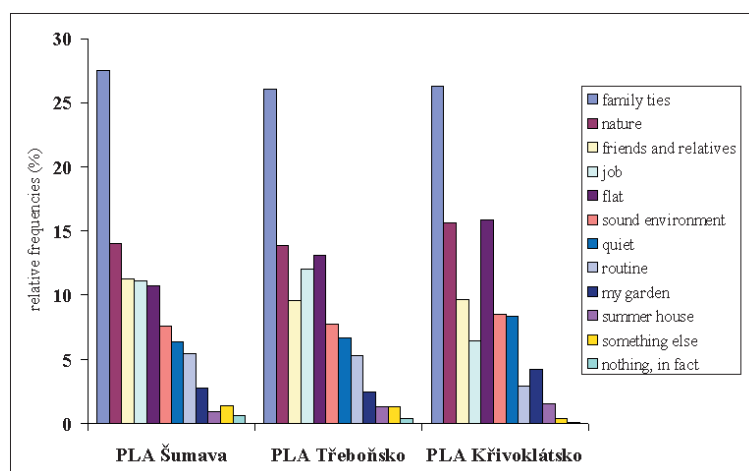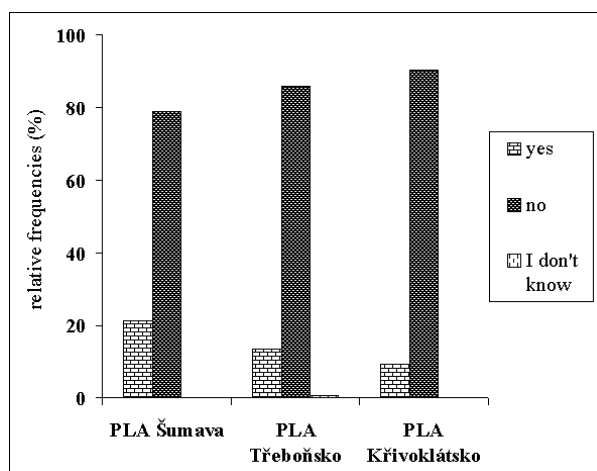
Figure 5. Ties to the territory

Figure 6. Intention to leave the territory

When evaluating 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 particular municipality and its history. As to their own current economic situation, they have as a rule not complained about it (Figure 7 and Figure 8).

Their everyday life does not seem to be much influenced by the fact that they live in protected area. In fact, only a minority of inhabitants have been encountering directly the representatives of the protected landscape area administration; they are as a rule only those who have had to deal with some legal or bureaucratic procedures in which administration of PLA participates. On the other hand, most people living in the area have been using some of facilities run by the administration, and participated in voluntary activities related to nature protection. They also highly appreciate the fact that the "label" of being recognised
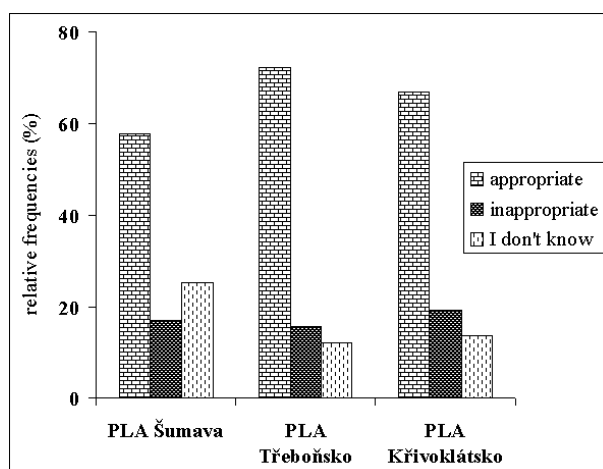
Figure 7. Quality of services and infrastructure related to the scale of municipality
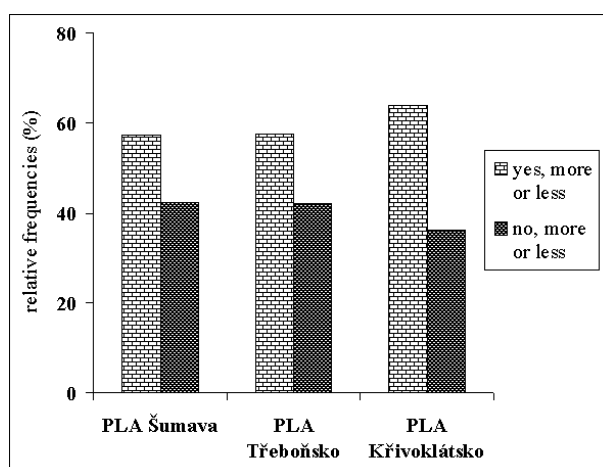

Figure 8. Satisfaction with personal economic situation

protected area increases tourist attractiveness of the whole territory (Figure 9 and Figure 10).

To sum up, it is possible to state that people living in the three protected areas do not feel handicapped in socio-economic sense. As to their relation to nature protection, they perceive it in a "peaceful way"; in some cases they even have been able to found a way of making some kind of profit out of it. The peaceful coexistence is primarily based on the fact that the representatives of municipalities as well as administration of protected areas have already overcome initial contradiction and have come to the point of building a joint vision of future coexistence. Sustainable tourism, as an activity acceptable by both sides, seems to have become key point of the above-mentioned common vision.
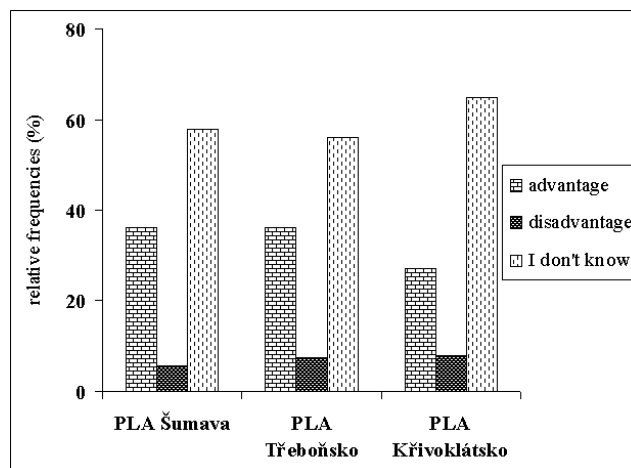
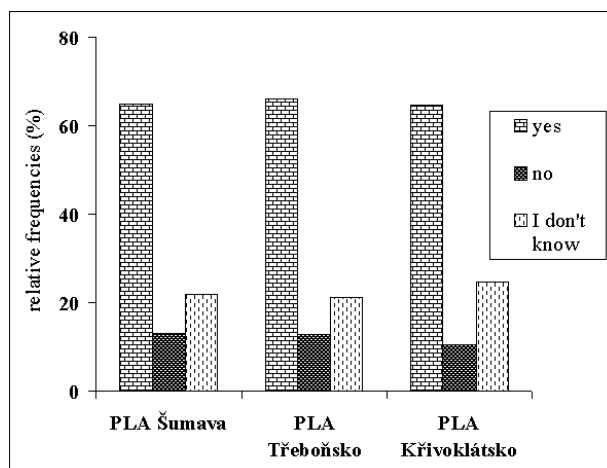**Figure 9.** Perception of PLA's influence on the life of local people

Figure 10. Does PLA increase tourist attractiveness of the region?

Conclusions

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. Having the status of being protected by law can be seen in two ways, as limitation and comparative advantage. On the one hand nature protection really poses limits on some economic activities as to their type, intensity or location. On the other hand, owing to the state policy of nature protection and policy of regional development, such regions are eligible for special funds, which cannot be applied for by other regions. To use the terminology of regional development theories, we would say that the label given to the territory by proclaiming it as protected area represents internal

potential of some kind that can but also or need not be commodified. The evidence proves that essentially all depends on local personalities and their activity.

If we agree with local key personalities and assume that sustainable tourism can be considered as the base for local economy in protected areas, we can go even further in our defence of nature protection. Thus, sustainable tourism can be characterised as small-scale and decentralised activity, friendly to natural as well as cultural environment, and based on active participation of locals. As an economic activity it is based on commodification of the natural as well as cultural capital of a particular locality or region (Jenkins 2001; Kušová *et al.* 2002). Therefrom, we can draw an apparently paradoxical conclusion, namely that nature protection can play a role of a guardian of long-term economic development as it keeps the comparative advantage of an area alive.

Acknowledgements

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