ACTA UNIVERSITATIS AGRICULTURAE ET SILVICULTURAE MENDELIANAE BRUNENSIS

Volume LIX 12 Number 4, 2011

ANALYSIS OF LIFE QUALITY INDICATORS IN THE AREA OF NATURAL RESOURCES IN CHOSEN MICRO-REGIONS IN THE CZECH REPUBLIC

J. Jánský

Received: May 4, 2011

Abstract

JÁNSKÝ, J.: *Analysis of life quality indicators in the area of natural resources in chosen micro-regions in the Czech Republic.* Acta univ. agric. et silvic. Mendel. Brun., 2011, LIX, No. 4, pp. 105–116

Approved strategy of sustainable development of the Czech Republic is based on three pillars of defensibility, namely social, economic and environmental. The paper is focused on the third pillar that includes field of natural resources. It is solved in municipalities of chosen micro-regions in the Czech Republic compared with level in particular regions. In term of chosen indicators it is concerned with the coefficient analysis of ecological stability of landscape.
Furthermore in the paper there are analysed chosen problems in the sphere of environment protection in particular districts where chosen micro-regions are situated. Analysis of environment protection is realized in years 2002–2008. Protection of environment is evaluated by indicators such as e.g. environmental assets and non-investment expenditures and emissions.

micro-region, natural resources, coefficient of ecological stability, environment protection, environmental assets and non-investment expenditures, disparities among municipalities of micro-region

Goals of the strategy of sustainable development in the environmental pillar are orientated to eliminate disparities, eventually reduce them at the most, not only among regions but also among municipalities. All of that is concurrently also in interaction with other two pillars of the mentioned strategy of sustainable development (Progress Report on the Sustainable Development Strategy of the CR 2009).

Total area of the Czech Republic (CZE) is 7.9 million hectares (78 866 km^2), there out farm land represents 4.3 million hectares (54%) and forests 2.6 million hectares (33%). In light of relief there mountains represent 12%, highlands 34%, hilly country 50% and lowlands 4%.

Area of farm land and non-farm land relatively stables in conditions of the Czech Republic. But their representation in individual regions is very different. It effect on quality of life in regions and micro-regions (Jánský, 2008).

Environment protection belongs to very topical questions today. It is fact not only in worldwide or national basis but also individual regions, micro-regions, municipalities or business entities solve this question. Ministry of the Environment submitted so-called Report on the Environment of the Czech Republic to the government (Report on the state of the environment). The report states that state of the environment is getting better after previous stagnation in years 2005–2006. But it also concurrently emphasizes that fundamental problems and menaces for future development, identified already in preceding years, gain importance. They are concerned growing emission of greenhouse gas, high share of airborne release from hardly controllable sources of pollution (traffic and house heating) and dynamic development of road transport that is connected with adverse impacts upon environment.

MATERIALS AND METHODS

The paper brings elaboration of analysis of disparities in the environmental pillar, especially in the field of natural resources utilization in chosen micro-regions of the Czech Republic. It is focused especially on indicators of structure of land using in regions and in their individual municipalities.

Researching is based on time lines of data about development of partial indicators of land utilization in municipalities and analyzes their complex formulation through coefficient of ecological stability. This coefficient represents relatively simple and concurrently measurable data not only on regions and rural district scale but also in individual municipalities.

In the next part of the paper there are analysed chosen problems in the sphere of environment protection in regions and districts where chosen micro-regions are situated. The analysis is realized by use of chosen indicators. Statistical data of environment protection are presented for individual regions and districts, not for micro-regions and municipalities. With regard to this fact, environment protection in certain micro-regions results from statistical data and indicators of appropriate districts where are micro-regions situated. For following micro-regions the analysis results from statistical data in mentioned regions and districts:

- micro-region Podluží – South Moravia region and districts Břeclav and Hodonín,
- micro-region Hranicko – Olomouc region and district Přerov,
- micro-region Běleč – Pilsen region and district Klatovy,
- micro-region Lučina – Pilsen region and district Tachov.

The paper analyses e.g. indicators such as environmental assets, environmental non-investment expenditures and emission in years 2002–2008.

Approach to environment protection is also analysed by use of questionnaire investigation. Questionnaires are completed by municipality's mayors of all municipalities and by chosen citizens of municipalities belonging to particular micro-regions.

The paper shows results of research project WD-57-07-1 *Possibilities of disparity solution between the chosen regions*, solved with subsidy of Ministry for Regional Development.

RESULTS AND DISCUSSION

Similarly, as in regions and rural districts of the Czech Republic is possible to evaluate life quality in the field of natural resources, it is possible to evaluate this field also in chosen micro-regions and their municipalities through specific indicators.

Evaluation is only adequate because indicators application is relative in some view. While some indicators are explicitly identifiable and measurable on the region and individual municipalities scale, other indicators aren't.

On the other hand, it is possible to better express certain specifics at the level of region and especially according to municipalities. Significance of these specifics and their evaluation on the higher level (e.g. through average values of region) is only informative. It can be e.g. evaluation of municipality from the view of location for mining of mineral material in municipality cadastre, hazardous waste dump etc.

Characteristic of chosen micro-regions

Subject of analysis of mentioned indicators' level in the field of natural resources are chosen micro-regions in the Czech Republic, namely micro-region Běleč and Lučina in the Pilsen region, Podluží in the South-Moravian region and micro-region Hranicko in the Olomouc region.

Voluntary bond of municipalities Micro-region Běleč is formed by 16 municipalities, north of Klatovy, where live 4655 inhabitants on the area 145 km^2. For this territory is characteristic Bohemian forest landscape and also a number of historical monuments, e.g. the castle Švihov.

Voluntary bond of municipalities Micro-region Lučina is situated in border area of district Tachov and is formed by 16 municipalities. It is characteristic by varied natural and wooded landscape with low level of ploughed farmland.

Voluntary bond of 14 municipalities Micro-region Podluží has unique location in the South-Moravian region. It consists not only in soil fertility but also in close vicinity with Austria and the Slovak Republic. This area is often called „painted region", it is characterized by flat landscape and warm climate. For the municipalities of the region is characteristic folklore connected with number of folk traditions and customs.

Voluntary bond of municipalities Micro-region Hranicko was started in 2001. Its member base is formed by 23 municipalities from tributary area of the town Hranice. Micro-region's territory lies between Moravská brána and Podbeskydská pahorkatina. Altitude of the territory moves at intervals 250 metres (in Hranice) to 502 metres (in Potštátsko) above sea level. The river Bečva forms axis of territory in east-west ward. In term of land utilization it is possible to characterize the territory as farm landscape. Forest land represents c. 20% of territory area. In the area there is defined number of small-area protected nature reserve and monuments.

Analysis of disparities development in the environmental pillar

Analysis of disparities development in the environmental pillar is realized through:

A: Indicators of structure of land utilization

B: Indicators focused on environment protection.

Indicators for expression and measuring structure of land utilization were available in time lines

according to individual municipalities. Indicators of other group, focused on environment protection, were not finding at lower level than is rural district.

As indicators of structure of land utilization in regions are possible follow indicators:

- Development indicator of total area
- Development indicator of total farmland area
- Development indicator of farmland structure according to cultures
- Development indicator of farmland area per one inhabitant
- Development indicator of total arable land area
- Development indicator of percentage of ploughed farmland
- Development indicator of total area for non-farm utilization
- Coefficient of ecological stability.

In the next part of the paper there we concentrate on analysis of ecological stability coefficient of landscape, on percentage of ploughed farmland and on significance of forest land (PUPFL[1]).

Coefficient of ecological stability (CES) is complex indicator that expresses quality of lands for guidance. It represents index number that sets ratio of stable elements of landscape formation (vineyards, hop-gardens, gardens and fruit groves, permanent grass stands, forest land and water area) and unstable elements (arable land, built-up areas and other areas) (Report on the state of the environment). The higher value of mentioned indicator the more ecologically stable is the landscape.

Values of mentioned indicator are classified by follow way (Míchal, 1994):

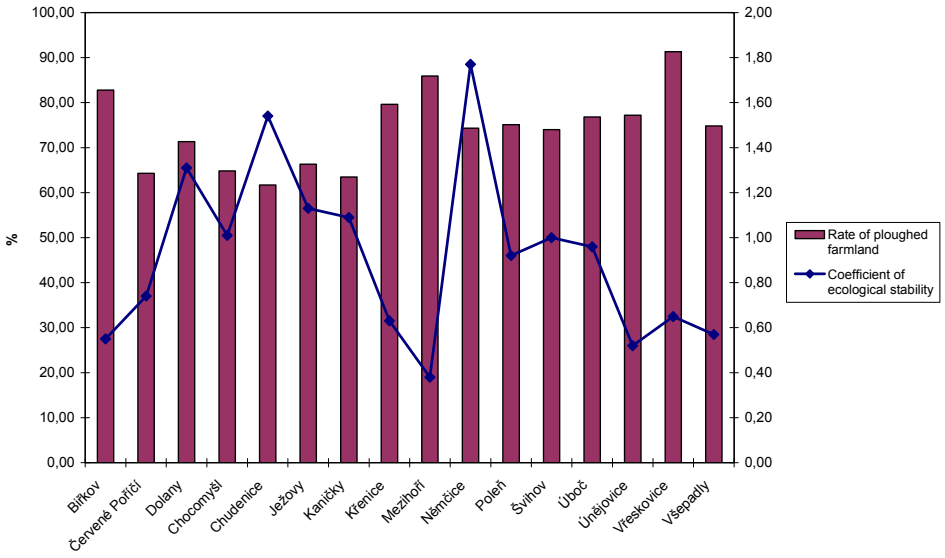
- CES to 0.1 represents territory with maximum invasion of natural structures, basic ecological functions must be permanently substituted by technical intervention,
- CES 0.11-0.3 represents territory that is outstandingly exploited with obvious invasion of natural structures, basic ecological functions must be permanently substituted by technical intervention,
- CES 0.31-1.0 represents territory that is intensively exploited, especially by agricultural production, weakening of self-regulated processes in ecosystems causes their great ecological instability and requires high inputs of additional energy,
- CES 1.01-3.0 represents on the whole balanced landscape where are technical objects relatively in keeping with survived natural structures, the result is also lower need of energy-material inputs,
- CES over 3.01 represents natural countryside and countryside close to nature with marked superiority of ecological stable structures and with low intensity of countryside utilization by man.

I: *Comparison of chosen indicators of land utilization structure in regions of the Czech Republic and in chosen micro-regions in 2006 (in %)*

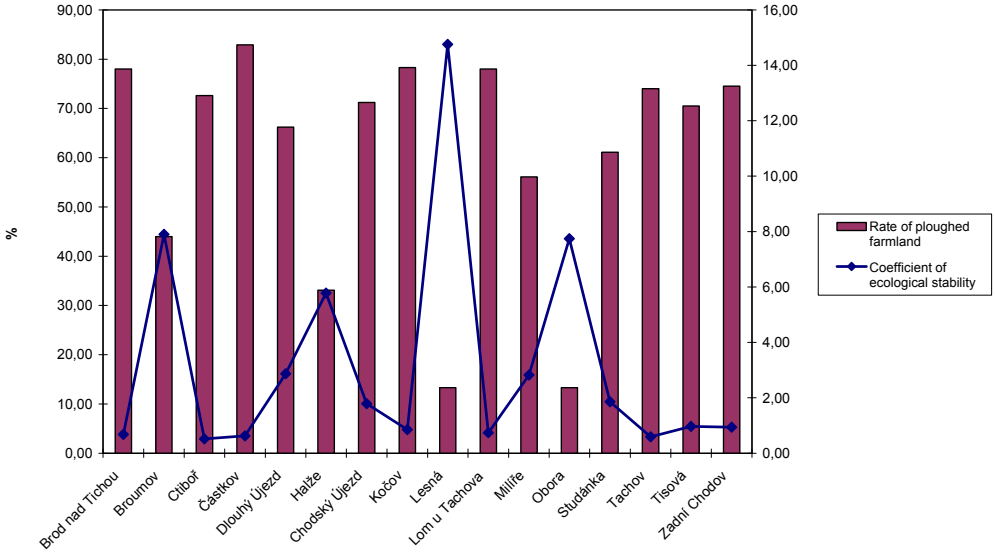
Region – micro-region	Rate of ploughed farmland	Coefficient of ecological stability
Czech Republic	71.44	1.04
Capital Prague	73.45	0.30
Central Bohemia	83.16	0.66
South Bohemia	64.52	1.45
Pilsen	68.80	1.32
Karlovy Vary	45.08	1.94
Ústí nad Labem	66.55	0.96
Liberec	48.68	2.18
Hradec Králové	69.10	1.03
Pardubice	73.16	0.89
Vysočina	77.44	0.84
South Moravia	83.20	0.67
Olomouc	74.45	0.98
Zlín	64.32	1.41
Moravian-Silesian	62.89	1.30
Micro-region Běleč – Pilsen region	74.01	0.92
Micro-region Lučina – Pilsen region	60.41	3.22
Micro-region Podluží – South Moravia region	82.87	0.68
Micro-region Hranicko – Olomouc region	77.02	0.55

Source: CSO, own calculations

1 Lands intended for performing function of forest according to § 3 of the law No. 289/1995 Sb., about forests.



1: *Coefficient of ecological stability and rate of ploughed farmland in municipalities of the region Běleč in 2006*
Source: CSO, own calculations



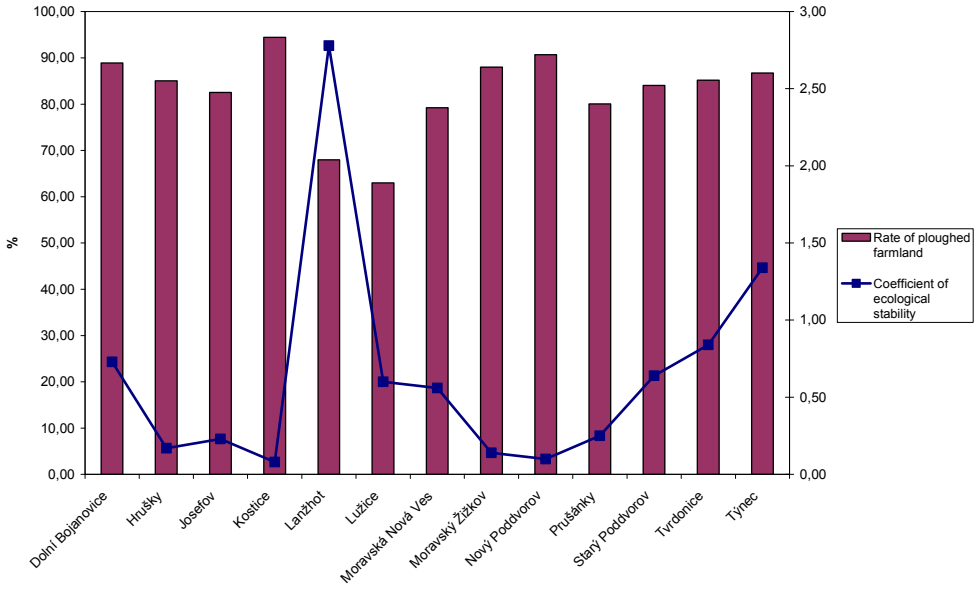
2: *Coefficient of ecological stability and rate of ploughed farmland in municipalities of the region Lučina in 2006*
Source: CSO, own calculations

Average value of this indicator in the Czech Republic is 1.04. Regions that have value of indicator over the average of the Czech Republic are: region Liberec, Karlovy Vary, South Bohemia, Zlín, Pilsen, Moravian-Silesian and Hradec Králové. By contrast, under average value of the Czech Republic are Capital of Prague and region Central Bohemia, South Moravia, Vysočina, Olomouc, Pardubice and Ústí nad Labem. Values of this indicator of ecological stability and rate of ploughing shows Tab. I.

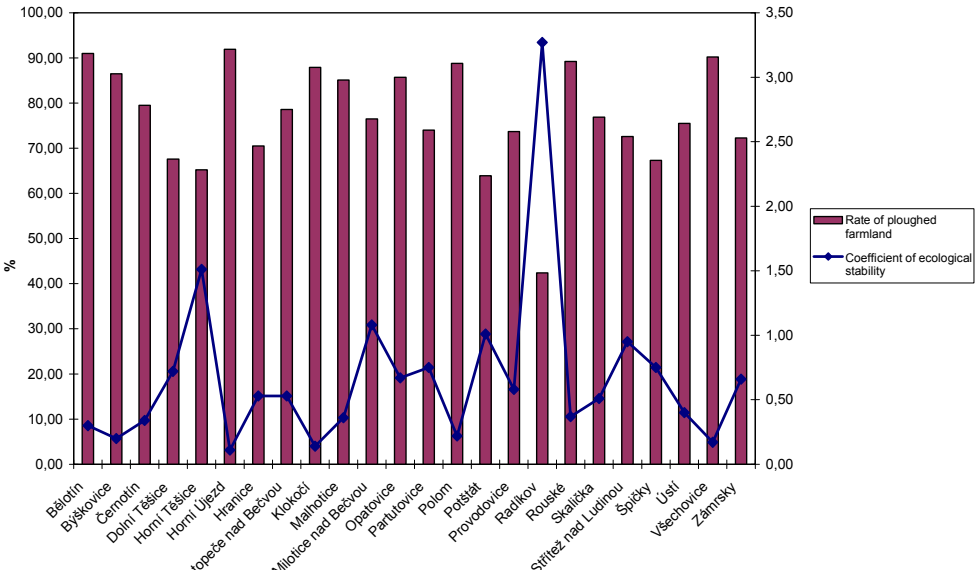
By comparison of average values of mentioned indicators according to regions and chosen micro-regions with data of the Czech Republic (1.04) in 2006 it is clear that most of values of individual micro-regions are much more variable.

Individual municipalities of chosen micro-regions show even much bigger variability as we can see in following pictures with data about rate of ploughed farmland and coefficient of ecological stability in 2006.

Classification of CES according to Míchal (1994) is based on clear and final formatting of landscape element into stable or unstable group and it doesn't enable to evaluate concrete state of these elements. Within forest management of the Czech Republic it is possible to find differentiation of ecological important e.g. in the law No. 289/1995 Sb. about



3: *Coefficient of ecological stability and rate of ploughed farmland in municipalities of the region Podluží in 2006*
Source: CSO, own calculations



4: *Coefficient of ecological stability and rate of ploughed farmland in municipalities of the region Hranicko in 2006*
Source: CSO, own calculations

forests – in case of methodology of charges calculation for depriving of forest land on the base of forest categorization – respectively through the factor of ecological weight of forest. This factor has value 1.4 in case of production forests whereas it takes the value 3.0 (forests in extra adverse stations) to 5.0 (high-elevation forest under limit on tree vegetation) in protection forests. Forests of special determination have accordingly value 5.0 (e.g. forests in water sources I. protection zone, forests of national parks – 1. zone, forests in especially protected territories, forests in system of ecological stability of territory).

As *indicators focused on environment protection* in chosen micro-regions are possible to use following indicators:

- Indicator of emissions (REZZO 1–3)
- Indicator of average environmental fixed assets per capita
- Indicator of average environmental non-investment expenditures per capita.

In the next analysis process there we concentrate on mentioned indicators that characterize development of environment protection and

disparities among monitored micro-regions during years 2002–2008.

Above mentioned indicators are based on data of statistical finding of CSO in districts and regions in the Czech Republic. District (eventually 2 districts) and region, where municipalities of micro-regions are situated, is closest high-level territorial unit that were subject of statistical finding of CSO.

For individual micro-regions the analysis results from statistical data in mentioned regions and districts:

- micro-region Podluží – South Moravia region and districts Břeclav and Hodonín,
- micro-region Hranicko – Olomouc region and district Přerov,
- micro-region Běleč – Pilsen region and district Klatovy,
- micro-region Lučina – Pilsen region and district Tachov.

Indicator of emissions (REZZO 1–3)

Emissions, it means quantity of pollutants emitted into environment air, represent one of serious environment pollution. Within the frame of this indicator there are monitored emissions of Sulphur dioxide (SO_2), Nitrogen oxides (NO_X) and Carbon monoxide (CO). Concrete values in chosen micro-regions belonging to appropriate districts of the regions shows Tab. II.

Environment pollution, from the view of emissions, is the highest in district Přerov, it means in term of monitored micro-regions it is micro-region Hranicko. Here, in this district measured values highly overreach average values of the whole region and also values of monitored categories (Sulphur dioxide, Nitrogen oxides and Carbon monoxide) several fold overreach values of other districts or micro-regions. District Přerov is important industrial locality in Olomouc region; it negatively influences all analysed values of emissions. The lowest pollution is noticeable in South Moravian region; but in district Hodonín there are excessive values especially of sulphur dioxide and nitrogen oxides. Low values of emissions are noticeable also in district Tachov, it means in micro-region Lučina. Also micro-region Běleč is not characterized by too high values of sulphur dioxide or nitrogen oxides. But higher pollution, as well as in micro-region Lučina, represents especially carbon monoxide. Nevertheless both micro-regions belong to less polluted areas of Pilsen region.

In mentioned cases of environment pollution is possible to say that also business entities must effect on management of environment protection. There are not only certain measures set by government, municipalities etc. Also enterprises formulate in their missions that they make efforts to protect environment; they publish it as their directives or management of environment protection. Enterprises so show their interest in environment protection not only by law-abidingness but also by voluntary definition of own directives of environment protection. Very often it is connected with using of instruments that include also systems of environment management according to standard ISO 140.

Indicator of average environmental fixed assets per capita

Investments in environment protection (environmental fixed assets) are one of important indicators of environment protection. They include expenditures of environmental fixed assets acquisition. Spheres of environment protection are especially control of air pollution and climate, wastewater management and waste management. Other fields of environment protection are landscape and biodiversity protection, protection and decontamination of land, underground and surface waters, limitation of noise and vibration (except workplace protection), protection against radiation, research and development and other activities of environment protection. Following Tab. III describes investments in mentioned spheres of environment protection.

Total average environmental fixed assets per capita are the highest in South Moravia Region, likewise in districts Břeclav and Hodonín, it means in micro-region Podluží. These investments overreach also average value of the whole Czech Republic. Micro-region Hranicko in district Přerov approximates to this republic average. But Olomouc region is characterized by lower investments at average. The lowest investments per capita are noted in micro-

II: *Average emissions (REZZO 1-3) in chosen regions and districts in years 2002-2007 (in kg.km^{-2})*

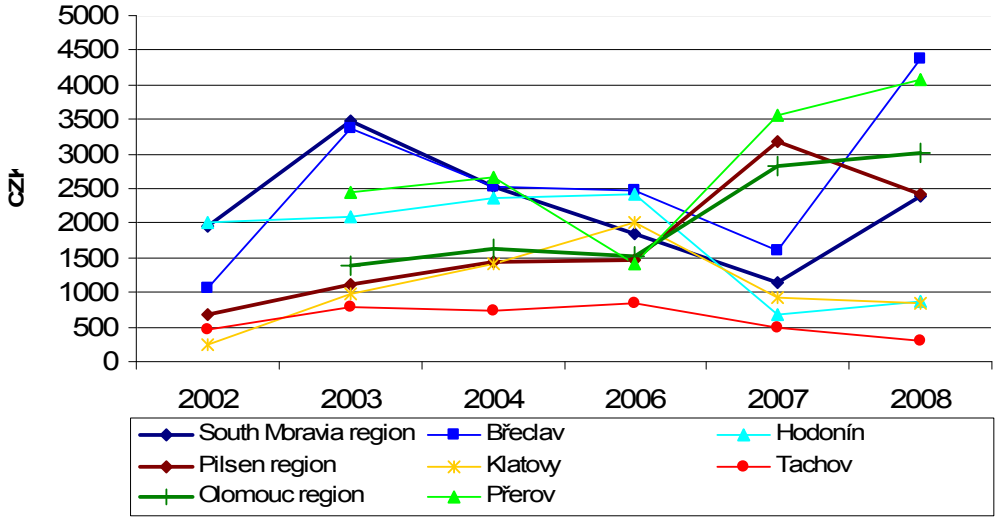
Region, district	Sulphur dioxide (SO_2)	Nitrogen oxides (NO_X)	Carbon monoxide (CO)
South Moravia Region	**564.0**	**669.0**	**829.0**
Břeclav	170.0	407.0	559.0
Hodonín	1785.0	829.0	635.0
Pilsen region	**1 500.1**	**671.8**	**1 297.0**
Klatovy	509.1	265.2	1 067.5
Tachov	275.3	155.3	734.6
Olomouc region	**1 203.3**	**770.6**	**1 273.6**
Přerov	3 224.3	2 329.5	3 308.5

Source: CSO, own calculations

III: *Average environmental fixed assets per capita in chosen regions and districts in years 2002–2008*

Region, district	Total (in CZK)	From that (in %)			
		air pollution control and climate protection	wastewater management	waste management	other
Czech Republic	**1 862.0**	**22.6**	**41.9**	**12.8**	**22.7**
South Moravia region	**2 420.0**	**19.2**	**56.2**	**12.1**	**12.5**
Břeclav	2 369.0	29.1	62.6	4.7	3.5
Hodonín	2 224.0	18.4	44.9	24.8	11.9
Pilsen region	**1 573.0**	**25.4**	**54.3**	**16.8**	**3.5**
Klatovy	1 115.5	31.7	47.7	14.0	6.7
Tachov	661.9	63.0	23.0	11.0	3.0
Olomouc region	**1 327.3**	**25.2**	**56.2**	**10.0**	**8.6**
Přerov	1 722.2	18.6	66.6	7.8	7.0

Source: CSO, own calculations



5: *Environmental fixed assets per capita*
Source: CSO, own calculations

region Lučina, it means in district Tachov. From these investments the highest amount (63%) is allocated to air pollution control and climate protection and so it is only district, and then also monitored micro-region, where investments in this field overreach. High share of investments in air pollution control is possible to objectively expect in district Přerov in Olomouc region. There are high emissions (see table II). But two-thirds of investments are focused on wastewater management here. Similarly also in other micro-regions, let us say in districts, there are investments connected especially with this field of environment protection.

Development of environmental fixed assets in monitored period 2002–2008 shows following figure 5. It is evident investments markedly increased in district Břeclav, whereas they fell in district Hodonín. Significant rising is shown also in district Přerov. Besides district Hodonín environmental fixed assets fell also in districts Klatovy and Tachov in recent two years of monitored period. So it is possible to suppose lower investments in corresponding micro-regions Běleč and Lučina. Investment development corresponds also to data in Tab. III and shows the highest environmental investments in districts Břeclav, Hodonín and Přerov.

Indicator of average environmental non-investment expenditures per capita

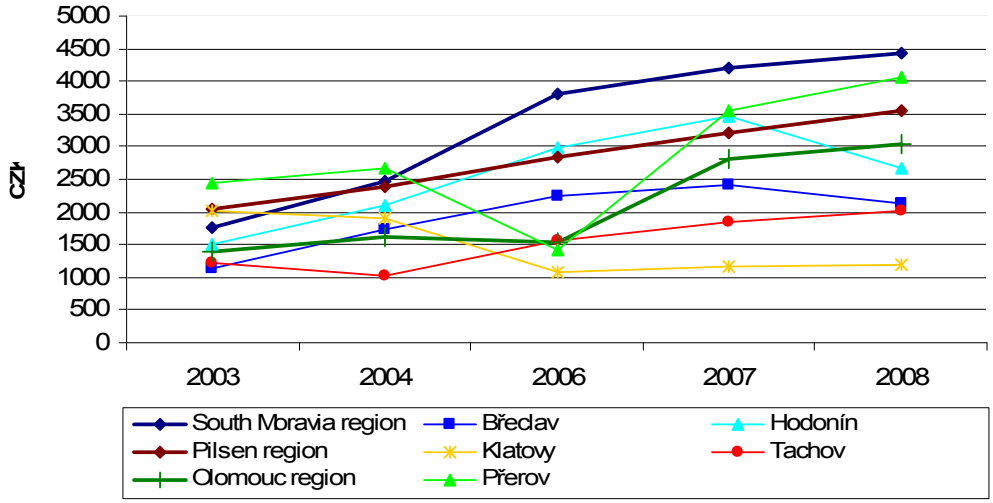
Environmental non-investment expenditures are important indicator of environment protection too. They include labour costs, rent payments, energy and other material and services payment; main object of services is environment protection. Also these non-investment expenditures are monitored in above mentioned spheres of environment protection. Concrete data are shown in Tab. IV.

In all monitored regions and districts there are average non-investment expenditures per capita lower than average of the Czech Republic. The lowest non-investment expenditures are in

IV: *Average environmental non-investment expenditures per capita in chosen regions and districts in years 2003–2008*

Region, districts	Total (in CZK)	From that (in %)			
		air pollution control and climate protection	wastewater management	waste management	other
Czech Republic	**3 126.0**	**20.0**	**8.0**	**57.0**	**15.0**
South Moravia region	**2 683.0**	**2.6**	**18.2**	**69.0**	**10.2**
Břeclav	1 696.0	2.8	29.5	62.0	5.7
Hodonín	2 197.0	2.5	25.4	57.2	15.0
Pilsen region	**2 623.1**	**7.6**	**27.8**	**60.5**	**4.1**
Klatovy	1 542.4	33.4	8.9	55.5	2.3
Tachov	1 416.2	2.4	8.1	84.5	5.0
Olomouc region	**1 839.6**	**8.8**	**30.5**	**51.1**	**9.6**
Přerov	2 518.8	10.3	34.1	34.9	20.7

Source: CSO, own calculations



6: *Environmental non-investment expenditures per capita*
Source: CSO, own calculations

Olomouc region (as well as environmental fixed assets); but by contrast district Přerov (where micro-region Hranicko is situated) is characterized by highest environmental non-investment expenditures. These expenditures are higher that environmental fixed assets. South Moravia region and Pilsen region are possible to consider as very balanced as well as districts Břeclav, Klatovy and Tachov. Higher non-investment expenditures are noticed in district Hodonín, the lowest expenditures in district Tachov – it means in micro-region Lučina. But micro-region Běleč closely follows micro-region Lučina. Environmental non-investment expenditures are connected especially with waste management. Exception is district Přerov, the also micro-region Hranicko, there are share of expenditures of wastewater management and waste management balanced. Exception is also district Klatovy, so it is possible to suppose important non-investment expenditures for air pollution control and climate protection (33%) also in micro-region Běleč.

Compared with variable development of environmental fixed assets non-investment expenditures pre capita increased all the time of monitored period 2003–2008 (see figure 6); this trend is noticed in almost all monitored regions and districts, then also in micro-regions. Again the highest non-investment expenditures are confirmed in district Hodonín, but there decreased these expenditures in last year. Also in district Přerov there non-investment expenditures fell in 2006. Generally it is possible to state higher environmental non-investment expenditures than fixed assets and increasing trend of non-investment expenditures.

Environment protection in municipalities of chosen micro-regions

In municipalities of chosen micro-regions there were also gained data from questionnaire investigation; it enables to complete analysis of environment protection in part. Questionnaire investigation was realized apart with municipalities'

mayors and apart with citizens of municipalities belonging to chosen micro-region.

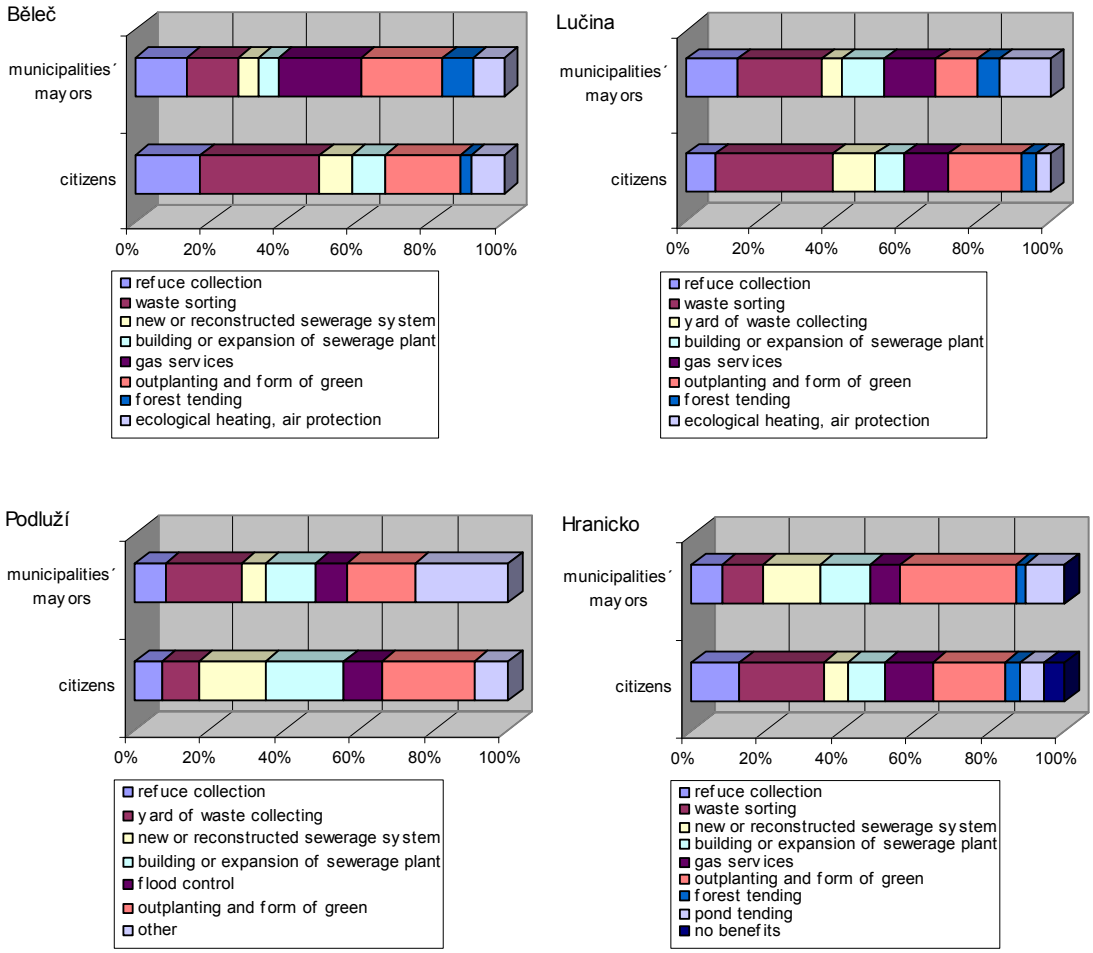
Municipalities of chosen micro-regions contribute to environment protection by quite a few of measures. Ranges of these measures are very broad. It is evident from answers rate of municipalities' mayors and citizens that same measures dominate in all monitored micro-regions. Most often, environment protection is realized in municipalities by waste sorting and collecting, gas services and sewerage, building up of sewerage plant. And it is interesting, in all micro-regions there is also often mentioned care of green (usually as the second most answer).

Micro-regions Běleč and Lučina have certain disparity in comparison with other monitored micro-region (Létalová, 2009). We remark that both of these micro-regions are situated in Pilsen region. This disparity is their common feature at once and it consists in problem of air protection. In some municipalities there are measures in a form of ecological heating of public building or ecological heating allowance in houses. Other municipalities mention these measures as notable possibilities to increase satisfaction of municipality citizens – common problem in both regions is waste combustion by houses. Problem of air protection confirm also e.g. high expenditures connected with this matter. Problem field in these micro-regions is also quality of drinking water. Alike, results of questionnaires confirm wastewater management expenditures and e.g. streams cleaning expenditures in micro-region Podluží. By contrast, micro-regions Podluží and Hranicko don't mention any problems with air and then any measures.

Another disparity, but very positive, is connected with micro-regions Hranicko, Běleč and Lučina. It probably follows from localization and relates to forests. Some municipalities of these regions mention importance of forest management, it means forest reproduction, forest tending, grubbing of forests attacked by bark beetle etc.

Concrete realized measures of environment protection are possible to see in graphic expression in following figure 7.

As noted previously citizens and municipalities mayors express their opinion of problems of environment protection also in connection with proposals for increasing of citizens' satisfaction. Not all mentioned measures of environment protection



7: *Benefits of micro-region for municipality in sphere of environment protection*
Source: own research

are realized in all municipalities, these measures are then proposed as possible ways to increasing of citizens' satisfaction.

CONCLUSIONS

The paper contributes to analysis of natural resources using especially by evaluation of defined indicators of land use and also complex indicator of ecological stability. In development of individual indicators there are not any essential changes since 2001. But there are specific disparities among municipalities of chosen micro-regions and disparities in data compared with values of region and republic. Possibilities of improvement of situation (or better said possibilities to elimination or lessening of mentioned disparities) are mostly gradual in the case of these indicators (e.g. increase share of grassing (it is % of area permanent grass stands), forestation of agriculturally abandoned lands etc.) Certain possibility is application of agro-environmental measures (e.g. in the field of environment protection and landscape protection, measures in reduction of action of soil erosion, in damming the water in landscape etc.).

Environment is burdened with problems caused human activities and that is why problems are mostly in conflict with natural environment. This question is generally referred to as environmental problems. So it is necessary to solve problems of care, protection and formation of environment. Successful solution of problems connected with this question is possible only with biological, technical, economical and legal knowledge. Also micro-regions and municipalities deal not only with environment protection but also with management of environment protection. But, as shown in the paper, micro-regions and municipalities always have not needed indicators that are suitable to their decision making in connection with necessary environment protection.

There is failure of monitoring of some indicators, especially in the field of environment protection at the level of micro-regions or directly in municipalities. Therefore there were used not only indicators detected at level of district but there were used also opinions of municipalities mayors and citizens. These data were collected in municipalities of certain micro-regions. The result is that this question has considerable importance for citizens and that citizens are interested in further improvement according to concrete situation.

SUMMARY

In the paper there is analyzed the third environmental pillar that includes field of natural resources. It is solved in municipalities of chosen micro-regions in the Czech Republic compared with level in particular regions. In term of chosen indicators it is concerned with the coefficient analysis of ecological stability of landscape. In connection with analysis of natural resources furthermore in the paper there are analysed chosen problems in the sphere of environment protection in particular districts where chosen micro-regions are situated. Analysis of environment protection is realized in years 2002–2008.

Researching is based on time lines of data about development of partial indicators that analyse field of natural resources and environment protection in chosen four micro-regions.

Coefficient of ecological stability (CES) is complex indicator that expresses quality of lands for guidance. Average value of this indicator is 1,04 in the Czech Republic. Regions that have value of indicator over the average of the Czech Republic are: region Liberec, Karlovy Vary, South Bohemia, Zlín, Pilsen, Moravian-Silesian and Hradec Králové. By contrast, under average value of the Czech Republic are Capital of Prague and region Central Bohemia, South Moravia, Vysočina, Olomouc, Pardubice and Ústí nad Labem. By comparison of average values of mentioned indicators according to regions and according to chosen micro-regions with data of the Czech Republic in 2006 it is clear that most of values of individual micro-regions are much more variable.

For analysis of environment protection in chosen micro-regions there were also used indicators of emissions (REZZO 1–3), Indicators of average environmental fixed assets per capita and Indicators of average environmental non-investment expenditures per capita.

Total average environmental fixed assets per capita are the highest in districts Břeclav and Hodonín, it means in micro-region Podluží. These investments overreach also average value of the whole Czech Republic. Micro-region Hranicko in district Přerov approximates to this republic average. The lowest investments per capita are noted in micro-region Lučina, it means in district Tachov. In all monitored districts and so also in micro-regions there are average non-investment expenditures per capita lower than average of the Czech Republic. The lowest non-investment expenditures are in Olomouc region (as well as environmental fixed assets); but by contrast district Přerov (where micro-region Hranicko is situated) is characterized by highest environmental non-investment expenditures.

In municipalities of chosen micro-regions there were also realized questionnaire investigation; it enables to complete analysis of environment protection in part. Municipalities of chosen micro-regions contribute to environment protection by quite a few of measures. Most often, environment

protection is realized in municipalities by waste sorting and collecting, gas services and sewerage, building up of sewerage plant. And it is interesting, in all micro-regions there is also often mentioned care of green.

From mentioned analyses follows great importance of monitoring and evaluating of this question for citizens in chosen municipalities and micro-regions. There also follows their interesting in further improvement of environment quality.

REFERENCES

JÁNSKÝ, J., KUPČÁK, V., ŽIVĚLOVÁ, I., 2008: Regional aspects of wood-working industry in the Czech Republic. INTERCATHEDRA, sv. 24, č. 1, s. 40–43. ISSN 1640-3622.

JÁNSKÝ, J., KUPČÁK, V., 2009: Posouzení vývoje zemědělství a lesnictví v regionech České republiky. In: Financovanie 2009 lesy – drevo. Zvolen: Technická univerzita vo Zvolene, 2009, s. 1–6. ISBN 978-80-228-2052-3.

LÉTALOVÁ, P., 2009: Srovnání aktuálních problémů ve vybraných regionech. Sborník z konference Region v rozvoji společnosti. Brno: MZLU, s. 162–168. ISBN 978-80-7375-330-6.

MÍCHAL, I., 1009: Ekologická stabilita. 2. rozš. vyd. Brno: Veronica, 276 s. ISBN 80-85368-22-6.

Progress Report on the Sustainable Development Strategy of the CR. MŽP, Praha 2009. ISBN 978-80-7212-488-6.

Report on the state of the environment. Ministry of Environment ČR [on-line]. [cit. 2009-02-11]. Dostupné z www: <http://mzp.cz/cz/zprávy_o_stavu_zivotniho_prostredi>.

Regional statistical yearbooks of the Czech Republic 2002–2008.

Address

doc. Ing. Jaroslav Jánský, CSc., Ústav regionální a podnikové ekonomiky, Mendelova univerzita v Brně, Zemědělská 1, 613 00 Brno, Česká republika, e-mail: jansky@mendelu.cz