Farming under environmental restrictions in the Beskyds and White Carpathians

Hospodaření zemědělských podniků při environmentálním omezení na území Beskyd a Bílých Karpat

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Abstract: The paper presents the results of research aimed at the analysis of the viability of agricultural enterprises which farm in less favoured areas and under the environmental restrictions pertaining to protected landscape areas. The target objects of the research were farmers taking care of mountain grasslands (meadows and grazing lands) in two protected landscape areas of the Czech Republic – the Beskyds and White Carpathians. The results are based on the sample survey carried out in 2006 and 2007. The first stage of the survey was devoted to the quality of life and business of farmers. The second stage of the survey concerned the financial condition of the farming businesses. Two statistical methods (analysis of variance, logistic regression) and the financial analysis method were used as analytic tools. The agricultural enterprises farming under environmental restrictions perceive their farming activities as a deal and mission. Farmers also accept restrictions while using the current subsidies. Compared to the farms outside the protected landscape areas, the farms in both protected land areas showed a higher profitability but a lower business activity. The analysis found out that the adverse age structure of farmers is a very important risk factor for rural development.

Key words: rural development, sustainable development, protected landscape area (PLA), agro-environmental measures, public goods

Abstrakt: Článek prezentuje výsledky výzkumu, jehož cílem byla analýza životaschopnosti zemědělských podniků hospodařících v produkčně znevýhodněných oblastech a pod vlivem environmentálních omezení chráněných krajinných oblastí. Objektem výzkumu byli zemědělci obhospodařující horské trvalé travní porosty (louky a pastviny) ve dvou chráněných krajinných oblastech ČR – v Beskydech a v Bílých Karpatech. Výsledky vycházejí z výběrového dotazníkového šetření z let 2006 a 2007. První fáze šetření byla věnována kvalitě života a podnikání zemědělců. Druhá fáze šetření se týkala finančního zdraví zemědělských podniků. Pro analýzu dat byly využity dvě statistické metody (analýza rozptylu, logistická regrese) a metoda finanční analýzy. Zemědělské podniky hospodařící v podmínkách environmentálního omezení vnímají své hospodářské aktivity jako úděl a poslání. Zemědělci rovněž akceptují omezení za současného využívání provozních dotací. V porovnání s farmami mimo území chráněné krajinné oblasti vykázaly podniky v obou CHKO vyšší rentabilitu ale nižší podnikatelskou aktivitu. Analýza identifikovala jako velmi důležitý faktor rizika pro rozvoj venkova nepříznivou věkovou strukturu farmářů.

Klíčová slova: rozvoj venkova, trvale udržitelný rozvoj, chráněná krajinná oblast (CHKO), agroenvironmentální opatření, veřejné statky

The most often quoted definition of sustainable development comes from the Brundtland Commission. According to the report of the Commission, sustainable development implies meeting the needs of the present without compromising the ability of future generations to meet their own needs (United Nations 1987). Sustainable development is the concurrence of three constituent parts – social, economic and environmental. In principle, people should ensure the material, social and cultural welfare using economic tools whilst respecting the limitation of natural resources. Generally, the aim of sustainable development should be the creation of such conditions for economic growth which would secure the appropriate quality of life of the present and future generations with minimal impacts on environment (Hrabánková,

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Boháčková 2007). Our decision or indecisiveness in the area of economics, agriculture, environment and social in the framework of developed and developing countries will determine the future of the planet Earth towards sustainable or non-sustainable development. A fundamental role in this decision-making process will be played by questions connected with the sustainable development of agriculture and nutrition, not only in the developing world but also in developed countries (Svatoš 2005). Some economic aspects of rural areas sustainable development have already been evaluated (Tvrdoň 2005).

Sustainable development in the agricultural sector is closely associated with the formation of multifunctional agriculture. The problem of caring for biodiversity in the landscape comes from the problem of the willingness to pay for public goods and, on the other hand, with the problem of opportunity costs. That confirms e.g. Svatoš (2005) who notes that the development of multifunctional agriculture is subject to many measures, among which a significant role is played by the measures to support the production of public goods which represents society's demand for these goods. The functioning of this quasi-market for public goods, i.e. the balance of demand and supply is given partly by the willingness of taxpayers to pay for public goods and partly by the willingness of farmers to produce public goods.

The reason why the research was conducted comes from the above mentioned concurrence of social, economic and environmental points of view. The main goal of the research followed from the basic thesis that farming in less favoured areas should contribute to the maintenance of the working rural population and the preservation of landscape areas as well as to the support of such farm systems whilst respecting the environmental requirements. It is necessary to point out another important aspect – the mission of the protected landscape areas (PLAs) is the protection and maintenance of biodiversity, and of natural and associated cultural resources. In general, the analysis was concerned with outlining the competition between interests concerned with business profitability and nature protection.

Firstly, the following questions were asked – "How do the farms in the Beskyds and White Carpathians prosper? Are they viable and able to keep and ensure the development of the areas which represent the national natural heritage?" Secondly, it was necessary to quantify the impact of environmental restrictions on the farm's economic results in both of the protected landscape areas.

The research was a partial outcome of the project UNDP-GEF (2006–2008) which has as its objective the enhancement of the respective care and utilisation of globally important biodiversity in floriferous mountainous grasslands (meadows and grazing lands) in two protected areas in the Carpathian mountains in the Czech Republic.

MATERIAL AND METHODS

The main objective of the paper is to present the results of the research aimed at the analysis of the viability of agricultural enterprises farming in less favoured areas and under the environmental restrictions of protected landscape areas. The target objects of the research were farmers taking care of mountainous grasslands (meadows and grazing lands) in two protected landscape areas of the Czech Republic – the Beskyds and the White Carpathians.

The research was carried out in two stages. A two-round sample survey was used as the data source. First stage of the research, carried out in 2006, was devoted to the quality of life and the business of farmers. The questions focused on qualitative data about using subsidies as well as about how farmers coped with environmental restrictions, marketing difficulties and the adverse age structure of people working on farm. For evaluation, two statistical methods were used – analysis of variance and logistic regression. The data was processed by the software statistical package Unistat 5.1.

The analysis of variance is a statistical approach for analysing the relationship between dependent and independent variables. It is based on the condition that independent factors take a small number of levels (in this case, there are only two levels). According to this, the dependent variables could be classified. Each of the two groups of dependents has a variance, an inter-individual variability. The analysis of variance evaluates the relationship of inter-group variance to the variance inside the group. The relationships were tested by the F-test with the significance level of 0.05.

Logistic regression is a statistic method used for the prediction of the probability of the occurrence of an event by fitting data to a logistic curve. Binary logistic regression is used when the dependent is a dichotomy (yes/no, respectively 1/0) and the independents are of any type. Logistic regression applies maximum likelihood estimation after transforming the dependent into a logit variable (the natural log of the odds of the dependent occurring or not). In this way, logistic regression estimates the odds of a certain event occurring.

The second stage of the survey, carried out in 2007, focused on the financial condition of the farms. In

this stage, 10 basic indicators of the financial condition were used – profit ratios (Return on Assets, Return on Sales), solvency ratios (Debt Ratio, Debt Equity Ratio, Equity Ratio), liquidity ratios (Current Ratio, Quick Ratio, Average Period of Short-term Settlement) and asset turnover ratios (Total Asset Turnover, Inventory Period) – combined with 7 supplementary indicators evaluating the level of farm income, subsidies, sales and assets per hectare, financial leverage and the share of current subsidies in the total sales. The analysis also tried to express the difference between the economic results including current subsidies and economic results without current subsidies. The sample included both farmers who did single-entry bookkeeping only as well as the farmers who did accrual accounting. The construction of financial indicators respected, to the highest degree, the compatibility between both these kinds of business records. The choice of the financial indicators was also limited by the available financial data. Agricultural enterprises with more than 50% of their farming in protected landscape areas were classified as PLAs. Table 1 describes in detail the construction of financial indicators.

Table 1. Indicators of the financial condition

Indicator	Unit of measure	Companies with accrual accounting	Sole trader holdings with single entry bookkeeping
Return on Assets (ROA)	%	100* Profit or loss before tax/Total assets	100* (Earnings – Expenses – Depreciation)/Assets
Return on Sales (ROS)	%	100* Profit or loss before tax/(Sales of goods + Sales of own products and services)	100* (Earnings – Expenses – Depreciation)/(Sales of goods + Sales of own products and services)
Current Ratio		Current assets/(Short-term liabilities + Short-term bank loans + Other short-term borrowings)	Current assets/Short-term liabilities incl. taken credits and loans
Quick Ratio		(Current assets – Stocks)/(Short-term liabilities + Short-term bank loans + Other short-term borrowings)	(Current assets – Stocks)/Short-term liabilities incl. taken credits and loans
Average Period of Short-term Settlement	Days	360* Short-term liabilities/(Sales of goods + Sales of own products and services)	360* Short-term liabilities/(Sales of goods + Sales of own products and services)
Debt Ratio	%	100* Liabilities/Total assets	100* (Liabilities incl. taken credits and loans + Provisions)/Assets
Debt Equity Ratio		Liabilities/Equity	(Liabilities incl. taken credits and loans + Provisions)/(Assets – Liabilities)
Equity Ratio		Equity/Total assets	(Assets – Liabilities)/Assets
Total Asset Turnover	Times a year	(Sales of goods + Sales of own products and services)/Total assets	(Sales of goods + Sales of own products and services)/Assets
Inventory Period	Days	360* Stocks/(Sales of goods + Sales of own products and services)	360* Stocks/(Sales of goods + Sales of own products and services)
Profit or loss per hectare incl. current subsidies	CZK	Profit or loss before tax/UAA[x)]	(Earnings – Expenses – Depreciation)/UAA
Profit or loss per hectare without current subsidies	CZK	(Profit or loss before tax – Current subsidies)/UAA	(Earnings – Expenses – Depreciation – Current subsidies)/UAA
Current subsidies per hectare	CZK	Current subsidies/UAA	Current subsidies/UAA
Sales per hectare	CZK	(Sales of goods + Sales of own products and services)/UAA	(Sales of goods + Sales of own products and services)/UAA
Assets per hectare	CZK	Total assets/UAA	Assets/UAA
Financial leverage		Total assets/Equity	Assets/(Assets – Liabilities)
Share of current subsidies in sales	%	Current subsidies/(Sales of goods + Sales of own products and services)	Current subsidies/(Sales of goods + Sales of own products and services)

* UAA – Utilized Agricultural Area

The above mentioned methods were completed by the methodological approach based on the comparison of costs and yields linked to the care of mountainous meadows and grazing lands. The current subsidies for the care of the permanent grasslands (excluding subsidies on investments) were considered to be the main source of farm revenues, specifically the SAPS and Top-Up payments, the LFA payments, the subsidies for the areas of Natura 2000, agro-environmental measures (priority II.1.3.) and the relevant subsidies from the Program of Preservation of the Landscape. The analysis of costs related to the care of permanent grasslands was devoted to the comparison of these options: Standard, Low-Input and PLA 1st zone. The first two options correspond to the Normatives of Agricultural Technologies (Kavka et al. 2006). The PLA 1st zone is a modification of the Low-Input option respecting the environmental restriction in the protected landscape areas in the Czech Republic. Technologies also passed through a consultation with experts from the Beskyds and White Carpathians.

The total number of surveyed farms was 51, of which 29 agricultural holdings farmed in the PLA of White Carpathians, 21 agricultural holdings farmed in the PLA of Beskyds and 1 farm covered both PLAs. There were 7 business companies and 44 individual farmer holdings surveyed. For comparability, mostly the farms with the type of farming "sheep, goats and other grazing livestock" were sampled. In the first stage of the survey, the total of 51 farms completed the questionnaire. Only 18 completed questionnaires were returned in the second round of the survey which focused on the financial indicators and financial condition of the farms. For this reason, the sample was completed with 6 or 7 farms of the same type (it depends on the sample size in each year) from the Farm Accountancy Data Network (FADN CZ). The farms the FADN CZ were outside the PLAs. The financial indicators were surveyed for the years 2004–2006. Thus the results of financial analysis represent the average for the period 2004–2006. The insufficient representation of the sample could be the biggest problem in the generalization of the results.

RESULTS AND DISCUSSION

The results of the statistical analysis of the first round of the survey are presented in Table 2a (results of the analysis of variance) and in Table 2b (results of the logistic regression). Statistically the less significant relationships were not published in this paper.

The analysis of the variance proved the relationship between renting permanent grasslands and an elder farmers having a successor, undertaking cattle breeding and respecting the agro-environmental measures. Both types of farms (i.e. natural persons as well as legal persons) seem to be more dependent on the subsidies connected with the preservation of the landscape. The dependence between farming of natural persons in the PLAs and cattle breeding is quite logical.

Logistic regression can reveal not only the dependence between two phenomena but also the level of their dependency. The results of logistic regression found a significant relationship between farming of both legal forms of farms in the PLAs and a high level of dependence of revenues on subsidies from the Ministry of Agriculture and the Ministry of the Environment. Findings about the controversial relationship between the farmer's interests in selling their produce under the regional brand names and their scepticism about the potential of marketing, promotion and educating the

Table 2a. Results of the analysis of variance (data from 2006)

Independents	Dependents
Natural persons, farming in PLA	Cattle breeding
Natural persons, from 45 to 55 years old	Cattle breeding
Natural persons, 55 and more years old	Permanent grasslands – rent
Natural + legal persons, sheep farming, wool production	Subsidies from the Programme of Preservation of the Landscape (Ministry of the Environment of the Czech Republic)
Natural persons, natural + legal persons, knowledge, respect, responsive to the tightening of agro-envi measures	Permanent grasslands – rent, lamb production and sale
Natural + legal persons, knowledge of agro-envi measures	Permanent grasslands – rent
Natural persons, succession in farming	Permanent grasslands – rent
Natural persons, Natural + legal persons, cows (mostly for milk)	Permanent grasslands – rent

Table 2b. Results of the logistic regression (data from 2006)

Independents	Dependents
Natural + legal persons, sheep farming	Plan of the enlarged cultivated area
Natural + legal persons, farming in PLA	Beef production
Natural + legal persons, interests in sale under regional brands	Expectations of regional brands
Natural + legal persons, insufficient marketing support	Interest in sales under regional brand
Natural + legal persons, subsidies are the main source of revenue (80 % and more)	Further use of subsidies from Ministry of Agriculture and Ministry of the Environment
Natural + legal persons, farming in PLA	Investments in machinery are the most important investments
Natural persons, natural + legal persons, farming in PLA	Use of subsidies from Ministry of the Environment
Natural + legal persons, farming in PLA	Use of subsidies from Ministry of Agriculture
Natural persons, age	Lamb production
Natural persons, from 45 to 55 years old	Use of subsidies from Ministry of Agriculture

public to the popularization of regional brands at the local and national level are interesting. The analysis of innovative use of local resources through the initiative and regional brand Tradice Bílých Karpat was made by Lošťák and Kučerová (2007). Both statistical approaches outline the risk of the adverse age structure of farmers for further rural development. There should be implemented more effective tools and strategies aimed at the maintenance and attraction of younger working people to the rural areas.

Table 3 gives details about the results of the financial analysis aimed at the evaluation of farm financial condition.

Solvency ratios measure the extent to which the firm is using long term debt. The basic indicator is the Debt Ratio, which provides an indication of a creditor's risk. Agricultural enterprises farming in the PLAs have a lower debt ratio as well as a lower debt equity ratio than farms outside the PLAs. If we take away the figures from the farms in the FADN CZ, the debt ratio of the farms outside the PLAs is near the recommended upper threshold of debt ratio (50 %). Farms in the PLAs finance their assets with equity capital to a greater extent than farms outside the PLAs. This fact adversely affects the financial leverage.

Liquidity ratios provide information about a firm's ability to meet its short-term financial obligations. Unlike solvency ratios, which are concerned with long-term assets and liabilities, liquidity ratios measure the short-term financial condition. Two general indicators of the liquidity are the current ratio and the quick ratio. The current ratio is the ratio of current assets to current liabilities. Table 3 shows that farms in the PLAs have a higher liquidity compared to the farms outside the PLAs. Farms in PLAs have an above-average liquidity which may provide evidence of the unproductive use of current assets. The liquidity level of the farms outside the PLAs comes near the advised standard values in the range 2.0–2.5.

Another frequently-used liquidity indicator is the average period of short-term settlement. Compared to the farms outside the PLAs, farmers in the PLAs have a shorter period but the difference is not very substantial. However, the period considerably exceeds 90 days generally considered as the threshold of bankruptcy. On the other hand, it should be a consequence of the long-term production cycles in agriculture.

Asset turnover ratios indicate how efficiently the firm uses its assets. Neither a too low asset level nor a too high is optimal. In the case of a too low level of assets, the firm loses sales; in the case of a too high level of assets, the firm shows superfluous costs. Two major asset turnover ratios were applied – the total asset turnover and the inventory period. The total asset turnover could be considered as an indicator of business activity. Results in Table 3 show that farmers in the PLAs have a lower business activity. This corresponds to the more extensive farming in protected landscape areas. Agriculture enterprises generally have a higher level of inventories than firms in the non-productive economic sectors. This is the reason why farms have high inventory period figures. The differences in inventory periods between the groups of farms were not sufficient.

Profitability ratios offer several different measures of the success of a firm in generating profits. In other words, profitability ratios indicate the firm's ability to earn income and to sustain growth in both the short-term and long-term. Return on assets (ROA) is an indicator defining how effectively the firm's assets are

being used to generate profits. Farms in the PLAs have a higher return on assets. The possible reason for this is the higher level of current subsidies per hectare of the agricultural enterprises farming in the PLAs. The relatively low level of return on sales (ROS) maintains the adverse value of the return on assets. Table 3 shows the big difference between the ROA including current subsidies and the ROA without subsidies. The ROA without subsidies shows negative numbers.

The financial analysis results were verified by comparing the financial condition of two agricultural enterprises farming in the Beskyds with the same type of farming and similar size.

The analysis of the sample survey was completed with a comparison of costs and yields linking to the care of mountainous meadows and grazing lands.

There are two mains sources of revenues – per hectare yields and subsidies. As regards grazing, there is one principle. At the equal level of fertilization, it can be established as a rule – the higher the frequency of grazing per year, the lower the yield of fodder per hectare which can be achieved, but it is of higher quality. The higher quality fodder leads to a better digestibility and voluntary feed intake. On the contrary, extensive farming results in a surplus of the uneaten green fodder as well as in a need for concentrated fodder (Fiala et al. 2008). Field experiments also proved that the key factors determining the yields of green fodder are weather conditions (duration of vegetation period, air temperature during year, level of precipitation etc.), the nutrient content and water regime of the soil, the frequency of mowing and the structure of species on the grazing lands and meadows (Velich 1996). Generally, a lower intensity of fertilization means lower yields per hectare. If we consider only the care of meadows and grazing lands without the revenues from the sale of livestock, we can calculate an average yield loss of meadows between 20 to 40% (it depends on the level of fertilization in non-mountainous areas which becomes lower). Because hay prices are not systematically monitored, **current subsidies** on the care of the permanent grasslands (excluding subsidies on investments) were considered to be the main source of farm revenues. The key subsidies

Table 3. Results of the financial analysis (average of the period 2004–2006)

Indicator	Unit of measure	PLA	Outside PLA incl. FADN	Outside PLA without FADN	FADN
Return on Assets (ROA)	%	5.85	3.92	3.06	10.12
ROA without current subsidies	%	–9.82	–13.80	–12.15	–25.78
Return on Sales (ROS)	%	15.64	8.51	5.85	37.75
ROS without current subsidies	%	–26.37	–29.98	–24.95	–96.23
Current Ratio	–	5.03	2.47	2.42	3.11
Quick Ratio	–	3.34	1.23	1.18	1.74
Average Period of Short-term Settlement	Days	77.67	111.85	111.38	118.01
Debt Ratio	%	29.18	48.78	50.17	38.74
Debt Equity Ratio	–	0.41	0.86	0.94	0.50
Equity Ratio	–	0.71	0.57	0.54	0.78
Total Asset Turnover	Times a year	0.37	0.46	0.49	0.27
Inventory Period	Days	163.24	165.86	162.77	206.51
Profit or loss per hectare incl. current subsidies	CZK	3 480.88	1 707.81	1 545.00	2 221.32
Profit or loss per hectare without current subsidies	CZK	–5 868.57	–6 016.41	–6 128.74	–5 662.11
Current subsidies per hectare	CZK	9 349.45	7 724.22	7 673.74	7 883.42
Sales per hectare	CZK	22 250.58	20 068.90	24 566.41	5 883.98
Assets per hectare	CZK	59 768.37	43 591.93	50 450.87	21 959.15
Financial leverage	–	1.41	1.77	1.87	1.28
Share of current subsidies in sales	%	42.0	38.5	31.2	134.0

determining the farm income depending on the level of extensiveness of farming are the LFA payments and the subsidies for organic farming. Regarding the financial support of farming in 1st zone of the PLAs with the most strictly applied rules of nature protection, some kinds of subsidies are reduced or not available (most agro-envirmental measures in priority II.1.3.). However, these cuts can be compensated for through the Natura 2000 payments aimed at 1st zones of national parks and the PLAs.

The other side of farm income are costs. Generally, total costs depend on the meadows and grazing management but the description of various kinds of grazing and mowing is not the purpose of this paper. To make a comparison of costs for the degree of extensity, technological costs for the following options were calculated: Standard, Low-Input and PLA 1st zone (one-cut and two-cut use of meadows). The method of cost calculation fully corresponded to the Normatives of Agricultural Technologies (Kavka et al. 2006). The results in the following table are only rough cost calculations. However, the relationship between the main items gives a true picture of the use of different technologies in maintaining permanent grasslands in various environmental and legal conditions. These results are presented in Table 4.

Particularly, legal restrictions in the PLA 1st zone forbid liming, mulching, manuring and the application of N-P-K fertilizers. These steps were excluded in the cost calculation. Costs of maintaining the meadows in 1st zone of the PLAs vary in the range 75–95% of the Low-Input level with the normative 9 t per hectare yield of green mass and in the range 30–40% of the Standard level with the normative 20 t per hectare yield of green mass. It depends on the frequency of meadow cutting. Table 3 cannot be grasped in terms of absolute figures, but it is particularly essential to see the relationship between various levels of production intensity. Compared to the costs taken over from the IAEI survey (Institute of Agricultural Economics and Information, Prague), the real level of costs is lower ranging from 4 000 CZK to 5 000 CZK per hectare (in 2006) depending on the production region. It should be observed that per hectare yields of green mass have seen a long-run drop, especially in the corn and beet production region. This trend is a consequence of the lower intensity of fodder production caused by the decline in livestock numbers.

Extensive care of grazing lands in the 1st zone of the PLAs is based on the repair of a fence before starting a grazing season and consists of both cutting green mass and scrap removal. This procedure contributes to the elimination of vegetation weeding and supports an increased compactness of the turf.

The costs of maintaining grazing lands with the Low-Input care regime are 58% of that of the Standard technology costs. The costs of maintaining grazing lands in the PLA 1st zone are 37% of Standard technology costs. The substantial cost relationship is a comparison between the Low-Input and PLA 1st zone options, because there is an insufficient area of grazing lands in the corn and beet production regions. The costs of maintaining the grazing lands in the PLA 1st zone differ by 36% from the Low-Input option. A range from 30% to 40% can be considered as a real difference. According to the IAEI survey, the real costs of maintaining grazing lands vary between 2 000 CZK and 3 000 CZK per hectare (in 2006).

Based on the comparison of costs and yields linking to the care of mountainous meadows and grazing lands, it can be seen that the more extensive care of permanent grasslands, the higher profitability per hectare can be achieved. This statement holds true only if farmers use the maximum available subsidies on maintaining the permanent grassland. It conforms with the conclusions of other studies (e.g. Voldřichová, Kvítek 2005).

CONCLUSION

Mountainous meadows and grazing lands in the Beskyds and White Carpathians PLAs are locations with an important mission aimed at the preservation of landscape and keeping biodiversity. Grazing is a suitable way of using permanent grasslands. The non-agricultural role of grazing currently has become more significant.

Table 4. Technological costs of maintaining permanent grasslands (in CZK per hectare)

Permanent grassland	Standard	Low-input	PLA 1st zone	
			one-cut use of meadows	two-cut use of meadows
Meadows	16 412	6 749	5 057	6 460
Grazing lands	8 444	4 916	3 140	

Note: Technological costs include variable and fixed costs

The objective of this research was to analyse the viability of agricultural enterprises in the protected landscape areas Beskyds and White Carpathians which farm in less favoured areas with environmental restrictions. This analysis has not tried to find a solution to the possibilities of reduction of the farmers' dependency on subsidies. This issue will be examined in the next stage of the research.

The following thesis emerges from the results of the first round of the survey aimed at the quality of life and farming business. Agricultural enterprises farming under environmental restrictions perceive their farming activities as a mission. They see the point of agro-environmental measures; they also accept the restrictions while using the current subsidies. The individual farmer holdings are open to business risk. The controversial relationship between the farmer's interests in selling their output under the regional brands and their scepticism of the role of marketing, promotion and public education to popularize regional brands at local and national level are obvious. The statistical analysis of the sample survey revealed that the adverse age structure of farmers has become a big problem for further rural development.

The financial analysis indicated the better financial conditions of agricultural enterprises farming in the PLAs. This results from the combination of higher farm revenues (i.e. higher current subsidies per hectare and higher revenues from sales) and a more extensive farming with lower inputs. Compared to the farms outside the protected landscape areas, the farms in both protected areas show a higher profitability but a lower business activity.

A comparison of costs and yields linked to the care of mountainous meadows and grazing lands produced the following thesis – the more extensive the care of permanent grasslands, the higher profitability per hectare can be realized (ceteris paribus). Within the two selected PLAs, this is true only if farmers use the maximum available subsidies on maintaining the permanent grasslands. Furthermore, subsidies should act as the motivation for maintaining biodiversity and natural land use. There is a need for the balance between extensive agriculture production and natural protection.

In the context of the agrarian policy measures, the key factors determining the higher farm income in mountain less favoured areas are the LFA payments and the payments for agro-environmental measures. The role of subsidies should be understood as the payments for the public goods produced for the countryside in the given place. Furthermore, the agrarian policy as well as the environmental research should concentrate more on the role of agriculture in keeping biodiversity in the core zones of the protected landscape areas.

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