

Current role of grasslands in development of agriculture and rural areas in Poland – an example of mountain voivodships małopolskie and podkarpackie

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Abstract: In paper the current situation of agriculture activity in mountain areas in Poland on the example of two mountain voivodships: małopolskie and podkarpackie was presented. Particular the role of permanent grasslands in development of agriculture and rural areas was highlighted. The tools for support of agriculture development in mountain areas i.e. LFA payments, payments for cow and sheep raising were presented. The future prospects of the development of mountain areas in Poland were showed.

Key words: agriculture, fodder use, livestock, mountain regions development, permanent grasslands

INTRODUCTION

Substantial limitation of areas and use of PG in last years in Poland determinates economic (the loss of productive potential of grasslands) and biological (soil and floristic composition degradation) losses. The existence of meadow ecosystems is threatened, being dependent on agricultural activity by preventing the natural succession. Their environmentally protective function is threatened, consequently. Forest succession such as overgrowing of grasslands by trees and shrubs proceeds, soils, particularly organic soils, are being degraded. The coefficient of soil organic matter is negative and water capacity of soils is smaller. There is a deficit of manure used for fertilising both arable lands and meadows. Hence, the limitation of animal breeding decreases not only fodder production from PG but affects the production of arable lands. Fallow lands covered 462 000 ha in 2008 and 498 400 ha e.g. 3.1% of AA in 2009.

Permanent grasslands are important element of environment, particularly in mountain regions. Permanent grasslands in Polish Carpathians occupy 35–40% and sometimes 60–70% of total area of this region. Mountain areas are characterized by considerable specificity resulting not only from particular features of natural environment but also from a kind of services paid for economic and social needs of the whole country (TWARDY, 2009). Mountain areas should play many important functions set up in a hierarchical order: hydrologic function, leisure and health care, environmental protection and economic functions (water management, agriculture and forestry).

GENERAL CHARACTERISTICS AND THE FODDER USE FROM PERMANENT GRASSLANDS IN POLAND

Permanent grasslands (PG) are the main source of fodder for ruminants. Even if extensively used they provide natural, valuable fodder rich in carotene, vitamins, microelements and other substances catalysing the processing of bulk fodder into milk and other animal products. This fodder is also cheap. The proportions of costs dairy cows feeding with green fodder, silage, hay and cereal grains are 100%, 130–150%, 180% and 350–500%, respectively (REKLEWSKI and KRZYŻEWSKI, 1997).

PG occupy 3180 thousand ha (2009) in Poland i.e. 10% of the country area and c. 20% of agricultural areas (AA). Meadows cover 77% and pastures – 23% of permanent grasslands (Tab. 1). This is a very small area compared with other European countries where PG constitute c. 30% or more of AA. Moreover, the area of PG in Poland has diminished by nearly 1 million ha in the last decade.

Table 1. Recent changes in the area and land use structure of permanent grasslands

Item	Years										
	1996	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Area, million ha	4.13	3.85	3.8	3.56	3.27	3.37	3.39	3.22	3.27	3.18	3.18
Percent of AA including:	23.1	21.9	21.7	21.1	20.2	20.6	21.3	20.2	19.8	19.7	19.7
meadows	14.82	14.2	14	15	14.5	14.6	15.9	15	15.4	15.2	15.3
pastures	8.28	7.7	7.7	6.1	5.7	6.0	5.4	5.2	4.4	4.5	4.4

PG are often situated in extreme habitats where other plants could not be grown due to soil moisture or slope inclination. Therefore, they are unevenly distributed throughout Poland, mainly in river valleys and in foothill and mountain regions (Fig. 1). Contribution of good and very good soils under PG is small (1.5%) whereas that of poorest soils exceeds 40%.

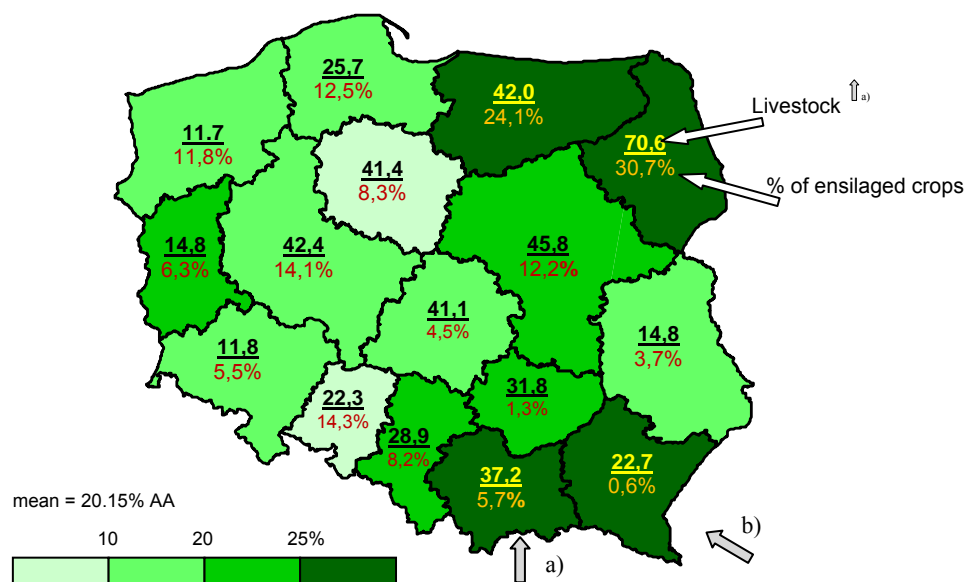


Fig. 1. Percent of PG in AA in Poland in particular voivodships (according to the legend), livestock (100 ha⁻¹ UR), % of ensilaged crops in voivodships; a) małopolskie, b) podkarpackie

Soils with good soil-agricultural complex (1z) represent only 2% of PG, medium soils (2z) – 60% and poor and very poor soils (3z) – 38% of PG (Fig. 2). The latter ones are usually situated in too dry or wet areas. Comparatively, nearly 50% of arable lands belong to complexes of unlimited crop selection.

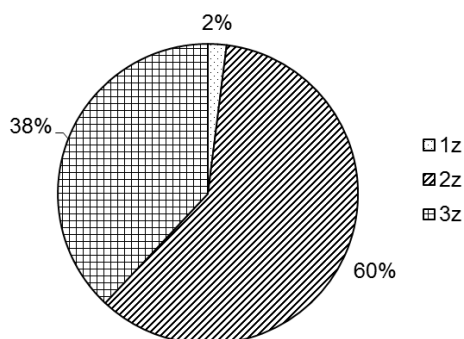


Fig. 2. Percentage share of soil-agriculture complexes of PG

Nevertheless, PG are the source of cheap and biologically valuable fodder for ruminants and other farm animals. The precondition of their existence is systematic biomass removal and grazing, those being the best ways of their use, not only for economic reasons. There is a close relationship between the quantity, quality and

use of PG and the livestock, for that grassland sward is the main bulk fodder. This is evidenced by a decline in animal stock (cattle, sheep but also horses – Tab. 2, 3) that took place at the break of the 20th and 21st century resulting in insufficient utilisation of PG despite unquestioned value of grassland sward.

Table 2. The number of farm animals (thousand heads) in Poland (acc. to GUS)

Stock	1980	1990	2000	2004	2007	2009
Cattle	12 649	10 049	6 083	5 353	5 405.5	5 700
Sheep	4 207	4 159	362	318	315.6	286
Horses	1 780	941	550	320	500	298

Table 3. Farm animal stock (head per 100 ha of AA) (acc. to GUS)

Years	Cattle		Sheep	Horses
	total	dairy cows		
1980	66.8	31.4	22.2	9.4
2004	32.8	17.1	1.9	2.0
2007	33.6	16.9	1.95	3.1
2009	35.4	16.7	1.8	1.8

A regress in animal production has been noted since 1980. Livestock decreased by more than 56% until 2009 and sheep breeding became marginal (Tab. 2). Cattle stock decreased two times between 1980 and 2004, horse stock – almost five times and sheep stock – nearly 12 times being only 1.9 head per 100 ha AA (Tab. 3). Payments for the agricultural production since Polish has accessed the European Union have initiated some positive changes. Cattle stock increased from 32.8 in 2004 to 35.4 head·(100 ha)⁻¹ AA in 2009. The number of dairy cows has decreased while that of beef cattle has increased. Farms that did not achieve the required veterinary standards were out-competed from milk production. An additional limitation came from imposed low milk quota. However the decline in the number of dairy cows did not translate into milk production. Mean milk efficiency of 4596 l per cow in 2009 increased by about 1430 l as compared with that in 1990 (Produkcja ..., 2010). Improved milk efficiency results from the restructuring and concentration of milk production and from the progress in fodder production and feeding quality. In podlaskie voivodship (the leader in cattle breeding) cattle stock is almost twice than the country mean and the percent of ensilaged grassland fodder is highest (Fig. 1).

Present productive use of PG is still insufficient due to extensive farming. Yielding is low (Tab. 4) and hay instead of silage is still the main product. The area of pastures decreased by half during from 1996 to 2009 (Tab. 1). Moreover, only 50–74% (mean 67%) of meadows is used as fodder sources and 9–16% is not

mown at all despite of the subsidies for mowing (Tab. 5). Yields from meadows have recently been collected in 65% as hay. Ten and nine percent were intended for silage and current feeding, while 17% of meadows were grazed (Produkcja..., 2005; 2006; 2007).

Table 4. Hay yields ($\text{t}\cdot\text{ha}^{-1}$) from PG acc. to GUS

Grassland	Years					Mean
	2005	2006	2007	2008	2009	
Meadow	4.28	3.85	5.18	4.84	4.92	4.61
I cut	2.39	2.40	2.64	2.62	2.38	2.49
II cut	1.33	0.74	1.72	1.46	1.72	1.39
III cut	0.56	0.71	0.82	0.76	0.82	0.73
Pasture ¹⁾	3.12	2.76	3.56	3.48	4.08	3.40

¹⁾ Fresh fodder recalculated for hay with the factor 0.2.

Table 5. Utilisation of meadows (%)

Specification	Years					Mean
	2005	2006	2007	2008	2009	
Fodder	60.8	50.3	76.3	74.4	74.6	67.3
Other purposes ¹⁾	23.2	34.3	12.8	17.0	14.1	20.3
Not used	16.0	15.4	10.9	8.6	11.3	12.4

¹⁾ Mowing for payments, compost, litter.

THE SPECIFICS OF FOOTHILL AND MOUNTAIN REGIONS IN POLAND

Ninety percent of PG in Poland is associated with river valleys or land depressions of a high ground water level; the remaining 10% represents grasslands in mountain areas with high atmospheric precipitation level.

Mountain regions above 300 m a.s.l. occupy 27 thousand km^2 (8.7% of the country area). They are built of three mountain ranges: the Carpathians (19 600 km^2), the Sudetes (4 800 km^2) and the Świętokrzyskie Mountains (3 200 km^2). The elevations 300–500 m a.s.l. occupy 5.7% of the country area, those in the range 500–1000 m a.s.l. – 2.9% and high mountains above 1000 m a.s.l. – only 0.1% of Poland (KOSTUCH, 1976; TWARDY, 1993).

Rich natural forms of these areas create attractive conditions for the development of various agricultural activities and technical infrastructure compared with other regions of the country. The largest areas are used for agriculture and forestry (50 and 39% of the area, respectively) (KOPEĆ, 1995). The largest areas occupied by farms can be found in małopolskie (53.1%), dolnośląskie (19.5%) and podkarpackie (19.0%) voivodships.

The specifics of particular mountain regions results not only from particular features of natural environment but also from a kind of services paid for economic and social needs of the whole country (TWARDY, 2009). Mountain areas should play many important functions set up in a hierarchical order: hydrologic function, leisure and health care, environmental protection and economic functions (water management, agriculture and forestry).

Due to temperature, precipitation, duration of the vegetation period, elevation and slope inclination mountain areas were used as arable lands but mainly as grasslands up to the elevation of 700 m a.s.l., sometimes higher. The areas are characterised by a similar index of soil usefulness for agriculture (Niskonakładowa..., 2001). Farming conditions of podkarpackie and małopolskie voivodships are typical for mountain and foothill regions. Therefore, the description of the role and utilisation of PG in mountain areas is based on these two examples.

CHARACTERISTICS OF AGRICULTURE IN PODKARPACKIE AND MAŁOPOLSKIE VOIVODSHIPS

Agricultural areas occupy 42% and 45% of the total area of podkarpackie and małopolskie vivodships, respectively. Arable lands prevail in 66% and 63%, respectively (Tab. 6). Percent of fallow and barren lands decreased from 6.7% in 2000 to 4.5% in 2009 in małopolskie voivodship and from 13.25 to 9.0% in the same time period in podkarpackie voivodship.

Table 6. Land use of mountain areas on the background of the country (Użytkowanie..., 2009)

Specification	Małopolskie voivodship	Podkarpackie voivodship	Poland
Surface area of AA, thousand ha	690.7	746.8	16 119.6
– arable lands, %	62.7	65.9	75.1
– orchards, %	2.3	1.4	2.1
PG in total	31.57	28.17	19.73
– meadows, %	25.15	22.35	15.28
– pastures, %	6.42	5.82	4.45
– other, %	3.51	4.47	3.07
Forests and forest grounds, thousand ha	437.4	671.0	9272.6
– % of total area	28.8	38.0	29.2
Fallow and barren lands, % AA	4.5	9.0	3.1

Moreover the consumption of mineral fertilisers was always low in mountain regions, lower than the country mean and it still decreases (Fig. 3). This is partly a result of the development of low-input or organic farming where the chemical fertilisers are not used.

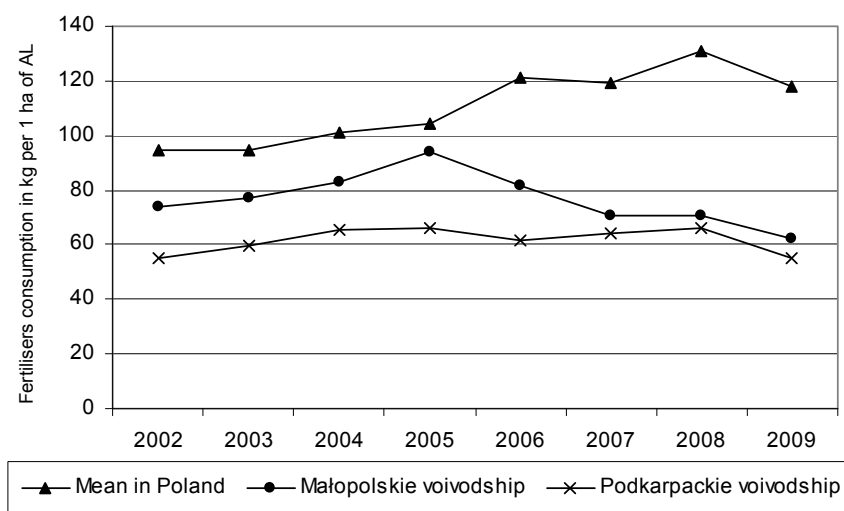


Fig. 3. Consumption of NPK fertilisers

Agriculture in małopolskie voivodship is quite differentiated. In northern part, farm areas are larger, this being partly an effect of its lower altitude. Smaller farms with developed mountain and fruit farming dominate in south-east part of the region (Program..., 2011).

Podkarpackie voivodship has little more favourable natural conditions despite quite variable land relief. Soils of the III, IV and V quality class prevail in both voivodships (84.7% AA in małopolskie and 87.3% AA in podkarpackie voivodship). Very poor soils (VI class intended for afforestation) cover 8.6% AA in małopolskie voivodship and 7.4% AA in podkarpackie voivodship. The share of the best soils (I and II class) is negligible. Acidification is the factor that decreases significantly soil quality. Liming is required in 70% of AA from both voivodships.

Most farms in both voivodships had an area of less than 1.0 ha in 2009 (Fig. 4). They represent over 40% out of the total area of 296.6 thousand ha in podkarpackie voivodship and 310.6 thousand ha in małopolskie voivodship. Mean AA surface in a farm from podkarpackie voivodship was 2.8 ha and 2.23 ha in małopolskie voivodship. The country mean was 6.27 ha.

The farms in both voivodships are highly dispersed despite their small area. As many as 24.7% of farms use six or even more separate plots. This does not favour new technologies and stimulates the development and progress in agriculture of the region (Niskonakładowa..., 2001). Combined with generally lower technologies it makes the labour inputs per plant production unit higher by 30–50% and those per animal production unit by 20–30% higher than the respective inputs in lowland agriculture (JANKOWSKA-HUFLEJT and PROKOPOWICZ, 2011).

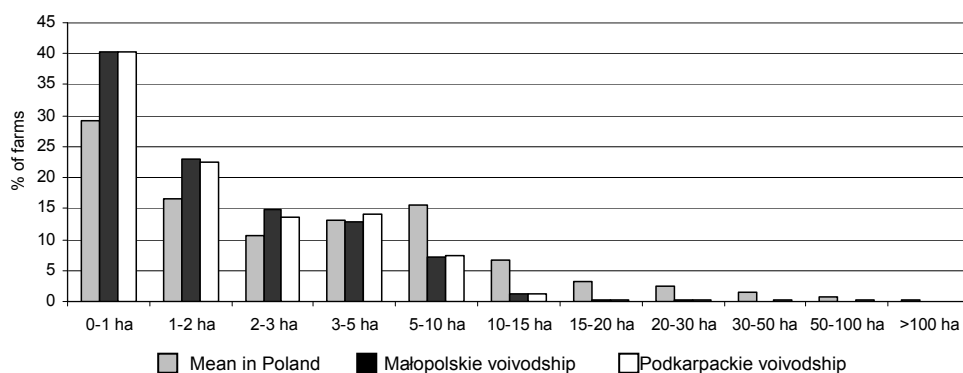


Fig. 4. Percent of farms in the groups of surface area (Statistical Yearbook of Agriculture, 2010)

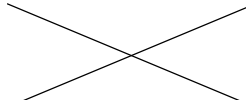
Dispersion of production determinates the profitability decrease of dairy cow breeding. Purchase prices (per 100 l without VAT) were also lowest in mountain voivodships (91.69 and 92.04 zł in podkarpackie and małopolskie voivodships, respectively as compared with 106.58 zł country mean). Limiting dispersion of milk production should improve the technological level of production. However, the most important for grassland management is the price relationships between animal products and appropriate merchandising. Milk production is still too low in relationship with the potential consumption of dairy products which makes a chance for the development of economically effective dairy farms in Poland.

THE USE OF PERMANENT GRASSLANDS ON THE BACKGROUND OF AGRICULTURAL AREAS

Permanent grasslands are present in most of the farms from the regions described previously. Their share in AA is significantly higher than the country mean (Tab. 6). They usually occupy sites inappropriate for field crops due mainly to soil features, elevation and situation on mountain slopes. Their share in feeding areas for ruminants in 2009 amounted 78.8% in małopolskie voivodship and 85.2% in podkarpackie voivodship (Produkcja..., 2010). Mean hay yield from meadows harvested during 2000–2009 was 4.5 t·ha⁻¹ in małopolskie voivodship, 4.08 t·ha⁻¹ in podkarpackie voivodship and the country mean was 4.3 t·ha⁻¹ (Tab. 7).

Vegetation of mountain PG is more diverse than in lowlands. There are more plant species communities and floristic types. This effect is due to variable habitat factors (elevation, relief, exposure, slope inclination, trophic status and moisture) and to the way of sward utilization (Niskonakładowa..., 2001). According to JAGŁA *et al.* (1971) the most important communities decisive for global fodder production of grassland include: typically pasture community *Lolio-Cynosuretum*, grassland community *Gladiolo-Agrostidetum* and natural or sown grassland are

Table 7. Grassland yielding in the years 2000–2009 acc. to GUS

Poland voivodship	2000	2002	2004	2006	2007	2008	2009			
							total	I cut	II cut	III cut
Hay yields from permanent meadows, t·ha ⁻¹										
Polska	3.82	4.17	4.4	3.71	5.17	4.83	4.92	2.38	1.72	0.83
Małopolskie	4.65	4.81	4.6	4.04	4.46	4.54	4.27	2.26	1.44	0.56
Podkarpackie	4.20	4.4	4.26	3.42	4.07	4.38	4.19	2.24	1.46	0.49
Fresh fodder yields from pastures, t·ha ⁻¹										
Polska	15.2	15.4	16.8	13.8	17.8	17.4	20.4			
Małopolskie	20.8	18.7	16.8	14.1	14.2	14.7	14.6			
Podkarpackie	15.4	14.7	14.2	9.4	13.7	12.7	11.9			

forming the community *Arrhenatheretum elatioris*. The most productive is *Arrhenatheretum elatioris* from among mown grasslands and *Lolio-Cynosuretum* among pastures. The least productive community is that with *Nardus stricta* gradually declining due to the utilization.

Satisfactory yield increases and fodder quality improvement can be achieved from these communities after mineral fertilisation with 100–120 kg N, 30–40 kg P and 60–80 kg K per ha. However, transformation of *Nardus stricta* degraded communities needs, more sophisticated management like full cultivation, penning (if possible) with sub-sowing of valuable grass and legume species (Niskonakładowa..., 2001; TWARDY, 1998).

The use of meadows in both voivodships was different. The share of not exploited or mown but not harvested meadows was smaller in małopolskie voivodship (Tab. 8). That in podkarpackie voivodship was larger than the country mean

Table 8. The use of meadows for different purposes in subsequent cuts in 2009

Poland voivodship	Meadows			
	grass harvested for fodder	grazed	mown but not harvested	not exploited
I cut				
Poland	75.3	8.4	5.0	11.3
Małopolskie	78.6	7.0	5.9	8.5
Podkarpackie	70.0	10.5	6.5	13.0
II cut				
Poland	67.6	15.5	2.8	14.1
Małopolskie	69.1	16.5	2.2	12.2
Podkarpackie	56.3	19.6	4.9	19.2
III cut				
Poland	41.7	29.9	1.6	26.8
Małopolskie	35.3	39.3	1.4	24.0
Podkarpackie	26.7	27.8	1.3	44.2

and in the third cut it amounted as much as 44%. The latter region is dominated by once and less frequently by twice cut meadows. Such frequency is typical for extensive farming. It allows to infer that grasslands in this region will rather play environmental than productive functions in the future (BARSZCZEWSKI *et al.*, 2009). Yields from permanent meadows are used in a slightly different way in the two voivodships, though they are mainly harvested for hay (in 61% in małopolskie and 70% in podkarpackie voivodships in 2009). Silage is more popular in małopolskie voivodship (12% ensilaged fresh fodder) than in podkarpackie voivodship (less than 3%). The rest of yields is intended for fresh fodder in current feeding or is grazed (Tab. 9).

Table 9. The structure of yields from meadows in 2009

Poland voivodship	Utilisation of yields from meadows, %			
	hay	silage	fresh fodder	grazed
Poland	51.4	23.3	9.3	16.0
Małopolskie	61.5	11.7	11.2	15.6
Podkarpackie	70.5	2.7	7.2	19.6

LIVESTOCK IN MOUNTAIN AREAS

Present status and the use of PG are closely related to livestock – the consumers of produced fodder (Tab. 10). Animals, mainly cattle and sheep, are the factor affecting the ways, intensity and utilisation of PG (JANKOWSKA-HUFLEJT *et al.*, 2009). Unfortunately, farm animal stock in both voivodships is still smaller than before (Tab. 2, 3) and the production of manure and liquid manure is still insufficient.

Table 10. The number of cattle, sheep, horses and goats in LU in 2009

Poland voivodship	Cattle	Sheep	Horses	Goats
Poland	4 235 085	28 638	357 530	11 884
Małopolskie	154 976	9 448	34 934	1 446
Podkarpackie	119 205	1 367	22 271	1 392

In 2009 the livestock was smaller by 11 heads per 100 ha in podkarpackie voivodship and by 16 heads in małopolskie voivodship as compared with the livestock in 2000. However, the stock of sheep increased by 100% in małopolskie voivodship and in podkarpackie voivodship it is now similar to the country mean (Tab. 11).

Table 11. Livestock, heads per 100 ha AA

Poland voivodship	Farm animals LU per 100 ha AA			Cattle			Sheep		
	2000	2005	2009	2000	2005	2009	2000	2005	2009
Poland	40.5	46.8	43.6	33.0	34.5	35.4	2.0	2.0	1.8
Małopolskie	44.1	46.5	36.0	44.3	38.4	28.4	6.9	12.0	13.7
Podkarpackie	30.8	29.9	23.7	30.6	23.6	19.6	1.5	2.5	1.8

SUPPORTING AGRICULTURE DEVELOPMENT IN MOUNTAIN AREAS

Less favoured areas. Mountain areas are classified as less favoured areas (LFA) since they have the worst agro-climatic conditions and the index of agricultural evaluation of productive space (AEPS) is almost half that in areas that do not need support (Tab. 12). Limited possibilities of field production (extreme climatic conditions, slope inclination) result in low efficiency, deteriorating the life conditions and leading to the depopulation of mountain areas.

Table 12. Comparison of productive conditions in LFA and other areas (acc. to PROW 2004–2006) – mean values of indices (TWARDY, 2008)

Parameters	Mountain LFA	LFA with handicap	Lowland LFA II	Lowland LFA I	Grounds outside LFA
AEPS index	42.7	56.4	48.6	59.9	75.7
Percent of PG	60.3	40.9	29.4	21.4	12.9
Percent of fallow lands	50.0	39.9	26.1	15.5	7.0
Productivity, % of the country mean	–74	–63	–39	–19	+1
Mean productivity PLN·ha ⁻¹	607	848	1 409	1 850	2 319

Therefore, mountain areas are supported by „LFA payments” according to the government Programme for the Development of Rural Areas 2007-2013. According to Poland’s law, communes are qualified as mountain LFA if more than 50% of their AA is situated higher than 500 m a.s.l. (Appendix 2 to the Government Decree of 14th April 2004). There are 93 communes that fulfil this criterion. They are situated in 22 counties and 4 voivodships: dolnośląskie, śląskie, małopolskie and podkarpackie.

According to the Agency for Restructuring and Modernization of Agriculture the payments to LFA in 2009 were amounted at 52.11 million PLN in małopolskie voivodship and 45.439 million PLN in podkarpackie voivodship which represented 7.2% of all LFA subsidies in the country.

The next support for agriculture in mountain areas and chance for restoration of farm animal breeding is a **new payment for cow and sheep breeding** (and also

for planting legumes and pulses) introduced in 2010 within the system of direct support of specific types of production. These payments amount 40.8 million euro per year including 28.5 million euro subsidy for cow breeding (142.5 euro per capita) and 1.5 million euro for sheep breeding (about 30 euro per capita). Farmers from 5 voivodships of southern Poland (podkarpackie, małopolskie, śląskie, opolskie and dolnośląskie) are entitled to this subsidy. Applying farmer must have a herd of up to 10 cows or at least 10 sheep at the age of at least 18 months.

PROSPECTS OF THE DEVELOPMENT OF MOUNTAIN AREAS IN POLAND

Most mountain areas are peripheral, hardly accessible grounds with intensified processes of economic and demographic marginalization (DAX and WIESINGER, 2007). According to SROKA (2008) these processes progress less intensively in Polish mountain areas and will be further mitigated in the next decade through implementation of broadly understood sustainable development. However, the prerequisite is the rational use of local and regional natural resources.

Due to socially unfavourable depopulation of upper mountain ranges, any non-agricultural activity should be assessed positively. Development is possible in agri-tourism with accompanying services like holding events, catering *etc.* Agriculture with the use of PG should remain as the basic and necessary activity due to the services it renders to cultural landscape, natural biodiversity, protection for erosion, water cycle and water quality.

A positive feature of transformation in grassland management (particularly in mountain areas) is the acknowledgement of their importance for natural environment. In Poland, as in the old EU member countries, the area involved in agri-environmental programmes and other payments enforcing protection and maintenance of PG continuously increases. Multifunctional character of PG combines the intensity of their use with protective effect on natural environment.

Organic production in mountain regions may be a chance for the development of small and medium size farms. Natural conditions, agricultural structure and social aspects weigh in favour of this option which is confirmed by the number of organic farms increasing from year to year. Between the years 2004 (Polands' access to the EU and implementation of payments) and 2009 the number of organic farms doubled in małopolskie voivodship and increased by 2.5 times in podkarpackie voivodship (Tab. 13). In 2009 the total area of organic farms was 11 766 ha in małopolskie and 16 766 ha in podkarpackie voivodship.

Small farms which sought a chance for increasing their incomes and remaining in the market were most numerous among organic farms. Farms of an area of less than 5 ha constituted 30% of organic farms in podkarpackie voivodship and 59% in małopolskie voivodship.

Table 13. The number of organic farms

Poland voivodships	2005	2006	2007	2008	2009
Poland	1 463	9 187	11 870	14 896	17 091
Małopolskie	1 187	1 363	1 627	2 100	2 197
Podkarpackie	855	1 164	1 577	1 892	2 014

In the years 2005–2008 were performed studies on 9 organic farms (5 in małopolskie and 4 in podkarpackie voivodships) from Polish Carpathians (500–1000 m a.s.l.) in the framework of a project of the Ministry of Agriculture and Rural Development (Badania..., 2009). Farms raised herbivorous animals. The average participation of PG in AA in examined farms was 76% (range from 35–100%). Surface area of organic farms ranged from 3 to 53 ha (32 ha in podkarpackie and 17.6 ha in małopolskie voivodship as the mean) which markedly exceeded the mean farm area in those voivodships. The dominant species breded was cattle, followed by sheep and goat. Obtained results showed that at 50% share of PG in AA such production is justified and provides plant diversity, grassland stability and good economic indices. Calculated balance of bulk fodder was equilibrated in most of the farms but sometimes showed excess or deficit. Large excess resulted from too small livestock or too high yield estimates. Smaller farms used also c. 30% of arable fields for planting, apart from potatoes, fodder plants (mainly mixtures of grasses and legumes) (Badania..., 2009).

Supporting the development of sustainable agriculture (including organic farming) is prospective for economic reasons, justified by the existing food base and necessary to maintain biological balance and to protect environmental values.

SUMMARY

In the very nature of things, agriculture in mountain areas is less efficient, more costly and hence less competitive and financially unattractive. Even specific equipment will not markedly change its unfavourable relations with the potential of lowland agriculture. Therefore, following the example of Alpine countries, agriculture in mountain areas must be dealt with as one of basis for permanent land use to protect natural and cultural values and the existing infrastructure. Organic farms able to fulfil the task of environmental protection and landscape management through the productive care of PG have a new chance in this aspect.

With respect to natural values of mountain areas, market agricultural production should be directed to dairy and beef ruminant breeding based on the own fertiliser and fodder base from grasslands and from fodder crops. This production might be the main source of incomes for farmers. Sheep breeding is one of the

niche directions in animal production which still has a chance for further development.

Functioning of mountain agriculture based on a large share of PG is a guarantee for maintaining many non-market farms whose role is limited to food production for own needs, to supporting social functions and preserving local traditions and culture.

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STRESZCZENIE

Aktualna rola użytków zielonych w rozwoju rolnictwa i obszarów wiejskich w Polsce – na przykładzie górskich województw małopolskiego i podkarpackiego

Słowa kluczowe: *obsada zwierząt, rolnictwo, rejony górskie, trwałe użytki zielone, rozwój obszarów wiejskich, wykorzystanie pasz*

W niniejszej pracy przedstawiono obecną sytuację rolnictwa na terenach górskich w Polsce na przykładzie dwóch województw: małopolskiego i podkarpackiego. Podkreślono szczególną rolę, produkcyjną i ochronną, jaką odgrywają trwałe użytki zielone w rozwoju obszarów wiejskich. Omówiono narzędzia wspierania i możliwości rozwoju rolnictwa w górskich obszarach wiejskich, takie jak płatności do obszarów ONW, płatności do chowu krów i owiec. Zaprezentowano również perspektywy rozwoju obszarów górskich, wśród których duże szanse upatruje się w systemie rolnictwa ekologicznego.

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