



Pastoral arrangement in Romania – A possible tool in the efficiency of pastures resulting from the fragmentation of agricultural exploitations

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Abstract. Permanent meadows, usually located on the outskirts of towns, in the vicinity or far from rural communities, are agricultural lands devoted to the production of grass (green grass or hay), harvested by grazing or mowing. From the introduction of the Land Fund Law no. 18/1991 until the publication of the Government Emergency Ordinance (G.E.O.) no. 34 of April 23, 2013, Romania's pastoral heritage, comprising 4.81 million ha of permanent meadows, has not benefited from an adequate legal framework for the management of this land fund. Thus, a Pastoral Arrangement has been drawn up by the Research and Development Institute for Sheep and Goat Palas- Constanța – Experimental Base Reghin (Romania), according to the application model, respectively the "Guide for the preparation of pastoral arrangements", published in 2014 and developed by the Institute for Meadows Brasov. The Experimental Base Reghin has an area of 235 ha in use, of which 200 ha are pastures and 4 animal shelters with a capacity of 1,500 capita. The Government Emergency Ordinance no. 34 of April 23, 2013, on the organization, administration and operation of permanent grasslands - with all subsequent amendments and completions and for amending and supplementing the Land Fund Law no. 18/1991, positively influenced the activity of the resort and its livestock, compared to the UVM / ha load (large cattle unit, UVM, is a standard unit of measurement established on the basis of the food requirement of each animal species).

Key Words: permanent meadows, pastoral heritage, feed resources.

Introduction. From the introduction of the Land Fund Law no. 18/1991 until the publication of the Government Emergency Ordinance (G.E.O.) no. 34 of April 23, 2013, Romania's pastoral heritage, comprising 4.81 million ha of permanent meadows, has not benefited from an adequate legal framework for the management of this land fund. The meadows in our country, which represent 33% of the agricultural area, are a part of the national wealth of the country and are of major importance because of the size of the feed resources and their quality. The Government Emergency Ordinance no. 34 of April 23, 2013, on the organization, administration and operation of permanent grasslands - with the subsequent amendments and completions and for the amending and supplementing the Land Fund Law no. 18/1991, positively influenced the activity of sheep and goat farms. Ordinance no. 34/2013, with subsequent amendments and completions, provided, among other rules, the implementation of some pastoral arrangements at the level of all Administrative Territorial Units (A.T.U.s) to improve the current state of productivity and quality of permanent grasslands and reduce the advanced level of floristic and functional degradation of these surfaces.

Legal framework. Article no. 9 to the G.E.O. no. 34/2013, regarding pastoral development, provides:

"Article 9 (1). For the development of grasslands in the public domain of communes, cities and municipalities and for their efficient use, the Administrative-Territorial Units, through mayors, in accordance with the decisions of local councils, based on the requests of animal breeders, natural or legal persons with animals registered in the National

Agricultural Register (NAR), concludes concession/rental contracts, in accordance with the law, for the available grassland areas, in proportion to the number of animals kept on the farm, for 7 to 10 years (July 5, 2014, Paragraph (1) of Article 9 was amended by point no. 9 of Article I of Law No. 86 of June 27, 2014, published in the Official Gazette No. 491 of July 2, 2014.).

(9) The local councils should approve the pastoral arrangements, valid for all the permanent meadows located on the Administrative Territorial Unit in question, drawn up by specialists from the Town Halls, county directorates for agriculture or specialists from the Territorial Inspectorates of Forest Regime and Hunting, as the case, in line with the guidelines developed by the Research-Development Institute for Grasslands Brasov, according to the provisions of the present Emergency Ordinance (on January 26, 2018, Paragraph (9) of Article 9 was amended by Point 10, Article I of Law no. 44 of January 19, 2018, published in the Official Gazette no. 69 of January 23, 2018).

(10) Specialists with attributions for the development of the pastoral arrangements provided in paragraph (9) shall be established in working groups by order of the prefect. Members of the working groups are nominated by the county agricultural commissioner's decision or the Municipality of Bucharest, as the case, and of the mayor. (on January 26, 2018, Article 9 was supplemented by Point 11, Article I of Law No. 44 of January 19, 2018, published in the Official Gazette No. 69 of January 23, 2018)."

According to the provisions of article 9, paragraph (9) of the Government Emergency Ordinance no. 34/2013, the pastoral arrangement project is drawn up according to the framework guide elaborated by the Research-Development Institute for Grassland - Braşov. The pastoral arrangement project must include at least the following elements:

- a) the description of the geographical and topographic situation and the plot (parcel) plan of the meadows located on the territory of the Administrative Territorial Unit;
- b) the description of the soil and flora;
- c) the grazing capacity of the meadow;
- d) meadow care and improvement work;
- e) fertilization plan and the establishment of agropedoameliorative measures.

Under the conditions of article 11 of the Government Emergency Ordinance no. 34/2013, to maintain and use grassland areas, as well as to conserve, improve and preserve their biodiversity, grassland users must apply, on each plot (parcel), the technical actions as well as the fertilization plan included in the pastoral development project.

The location and definition in terrestrial space of each surface of the analyzed meadows, the soils on which it vegetates, play a significant role in determining the ecological conditions for the growth of plants on meadows. During the 2013-2021 period, although the working groups set up at the level of each county benefited from an application model, namely the "Guide for the preparation of pastoral arrangements", published in 2014 and developed by the Institute for Meadows Brasov, the purpose of this work, so important for the pastoral economy, was not performed. Moreover, since the publication of the Emergency Ordinance no. 34/2013 and until now several legislative acts have been issued to annually extend the implementation of these arrangements. Thus, from the Government Emergency Ordinance no. 78 of December 2019, article 10 to G.E.O. no. 34/2013:

"The Romanian government adopts this Emergency Ordinance.

ART I

Article 10 of the Government Emergency Ordinance no. 34/2013 regarding the organization, administration and operation of the permanent meadows and for the amendment and completion of the Land Fund Law no. 18/1991, published in the Official Gazette of Romania, Part I, no. 267 of May 13, 2013, approved with amendments and completions by Law no. 86/2014, with subsequent amendments and completions, paragraph (1), is amended and will have the following content:

ART 10

In order to access the European funds related to surface payments, the users of meadows, natural and legal persons, as owners and/or legal holders of the right to use

the land, must ensure a minimum load of 0.3 UVM/ha annually on any of the days of the grazing period, or to mow the vegetation at least once a year. Starting with the year 2021, the application of the pastoral arrangement is obligatory.....”.

Moreover, O.U.G no. 225 of December 2020 extended the deadline for the application of the pastoral arrangement starting with January 2022. Through the Emergency Ordinance no. 130 of December 17, 2021, the last deadline for the entry into force of the application of the pastoral arrangement was extended for January 1, 2023. Art. 2 of G.E.O. no. 34 of April 23, 2013, among others, the definitions of the following terms are given:

“a) grass and other herbaceous forages - all herbaceous plants which are traditionally found in natural pastures and hayfields or which are included in the specific mixtures for sowing and oversowing, the grass and legume families used as forages in the feeding of herbivorous animals, based on the production, nutritional value of the meadow and the grazing capacity are calculated;

b) pastures and hayfields - agricultural areas listed in the deeds of ownership with these categories of use, which are intended for the production of forages, grass and other herbaceous plants for animals, harvested whether by grazing or mowing; (on July 5, 2014, Letter b) of article 2 was modified by point 4 of Art. I of Law no. 86 of June 27, 2014, published in the Official Gazette no. 491 of July 2, 2014.)

(c) large bovine unit (LWM) - a standard unit of measurement established based on the feeding needs of each animal species, which allows the conversion of different categories of animals;”

The Research and Development Institute for Sheep and Goat Palas- Constanța – Experimental Base Reghin (Romania) carries out its activity based on the Government Decision no. 35/2006 on the establishment of agricultural research and development stations in the field of animal husbandry through the reorganization of some agricultural research and production stations in the field of animal husbandry.

The Research and Development Station for Sheep and Goat Reghin was established in 1982 and had 12,000 sheep. The "Experimental Base" in Reghin, without legal personality, was established following the merger with I.C.D.C.O.C. Palas Constanța. Today, they have a herd of 1,000 sheep and goats, of which 800 sheep and 200 goats. The unit prepares its fibrous forages, and the concentrates (grains) are sent from Palas Constanța. It is a public institution financed from the budget, but with several ongoing projects with the Ministry of Agriculture. The Experimental Base Reghin has an area of 235 ha in use, of which 200 ha are pastures and 4 animal shelters with a capacity of 1,500 capita.

The Government Emergency Ordinance no. 34 of April 23, 2013, on the organization, administration and operation of permanent grasslands - with all subsequent amendments and completions and for amending and supplementing the Land Fund Law no. 18/1991, positively influenced the activity of the resort and its livestock, compared to the UVM ha⁻¹ load. Thus, after the pasture arrangement works, the load reached from 0.8 UVM ha⁻¹ to 1.2 UVM ha⁻¹, thus respecting the provisions of Law no. 75 of April 25, 2019, for the amendment of the Government Emergency Ordinance no. 34/2013 and for the amendment and completion of the Land Fund Law no. 18/1991, which specifies:

"Article 10

In order to access the European funds related to surface payments, the users of meadows, natural and legal persons, as owners and/or legal holders of the right to use the land, must ensure a minimum load of 0.3 UVM ha⁻¹ annually on any of the days of the grazing period, or to mow the vegetation at least once a year. Starting with the year 2021, the application of the pastoral arrangement is obligatory.” (Law no. 75 of April 25, 2019).

The mandatory application term of the pastoral arrangement was extended for January 1, 2023, by Emergency Ordinance no. 130 of December 17, 2021:

Article XVII

The term provided in paragraph (1) of Article 10 of the Government Emergency Ordinance no. 34/2013 on the organization, administration and operation of permanent meadows and for the amendment and completion of the Land Fund Law no. 18/1991,

published in the Official Gazette of Romania, Part I, no. 267 of May 13, 2013, approved with amendments and completions by Law no. 86/2014, with subsequent amendments and completions, as extended by article I of the Government Emergency Ordinance no. 225/2020 on amending some normative acts and establishing some measures in the field of agriculture, published in the Official Gazette of Romania, Part I, no. 1331 of December 31, 2020, is extended until January 1, 2023 (G.E.O. no. 130 of December 17, 2021). Thus, the Pastoral Arrangement has been drawn up for the Research and Development Institute for Sheep and Goat Palas - Constanța – Experimental Base Reghin (Romania), according to the application model, respectively the "Guide for the preparation of pastoral arrangements", published in 2014 and developed by the Institute for Meadows Brasov.

The Pastoral Arrangement is considered of great importance and interest, both for the training of future specialists interested in pratological research, but also for informing and increasing the knowledge of the owners, administrators and concessionaires of meadows. It comprises several chapters:

- a) Introduction of the arranged area in the cadastral and geographical context;
- b) Analysis of current green mass production;
- c) Descriptive analysis of the pedological and climatic factors of the arranged area;
- d) Framing the use and capitalization of the meadows;
- e) Analysis of the current production capacity and establishment of the grazing capacity of the meadow areas;
- f) Establishing measures to improve meadows;
- g) Implementing modern technology in lawn care.

In addition to the main objective of providing the necessary forages for at least 80% of the sheep flock, meadows have several important functions in rural and environmental development. These functions reflect and define the multifunctionality of the meadows. This Pastoral Arrangement was thought up and followed up by I. I. Butilcă Ioan from Reghin for the two surfaces belonging to the "Experimental Base Reghin" of I.C.D.C.O.C. Palas Constanța, and declared to A.P.I.A., respectively: A.T.U. Solovăstru 69.43 ha and A.T.U. Gurghiu 92.97 ha. Table 1 shows various data from the Pastoral Arrangement.

Table 1

Data from the Pastoral Arrangement

<i>Currently estimated green mass production</i>							
Average area (ha)		Green mass production (to ha ⁻¹ year ⁻¹)		Total green mass production (to)			
162.4		7		1,136.8			
Land use: Mixed capitalization (pasture, hayfield) from 162.4 ha							
Pedological and geological characteristics							
Soil type				Type of resort			
Stagnant Planosol and Luvisol - cold soils				FD2 = hill slopes with hillsides			
Climatic data							
Average annual temperature				Average annual rainfall			
8.5 - 8.7°C				650 - 670 mm			
Current production capacity							
Surface (ha)	Average production (to ha ⁻¹)	Total production (to)	Usage coeffic. (%)	Useful production (ha)	Days of grazing	Grazing capacity (UVM ha ⁻¹)	Grazing capacity (UVM capita ⁻¹)
162.4	7	1,136.8	95	6.65	160	0.83	134.79

Grazing capacity is determined by dividing the total green mass production by the ration required for a large cattle unit (UVM). 65 kg of green mass day⁻¹ capita⁻¹ is recommended for 1 UVM, of which 50 kg capita⁻¹ day⁻¹ is actually consumed. The conversion of domestic

animal species into UVM is shown in Table 2, drawn up in accordance with the legislation in force.

Table 2

Conversion of domestic animal species into UVM

<i>Animal category</i>	<i>Conversion coefficient</i>	<i>Capita UVM⁻¹</i>
Bulls, cows and other cattle for more than 2 years, equidae for more than 6 months	1.0	1.0
Cattle between 6 months and 2 years	0.6	1.6
Cattle less than 6 months old	0.4	2.5
Sheep and goats of all ages	0.14	7.1
Mature sheep and goats	0.15–0.16	6.3–6.7

The following works were performed:

- mechanical cleaning of non-valuable woody vegetation (mechanically with STIHIL 510 C-EM mower with diamond disc or K variant for jobs in forestry);
- mechanical control of mosses covered with pasture milling;
- weed control works - manual and chemical;
- improvement works which consisted of organic and chemical fertilization, weeding (action of fertilizing a meadow), overseeding.

After the application of permanent meadow improvement works by deforestation, oversowing of the soil, fertilization of the meadows, the grazing capacity increased from 0.83 UVM ha⁻¹ to 1.12 UVM ha⁻¹ (Table 3):

Table 3

Grazing capacity after the application of permanent meadow improvement works

<i>Surface (ha)</i>	<i>Green mass production (to ha⁻¹)</i>	<i>Usage coeffic. (%)</i>	<i>Useful green mass production (to ha⁻¹)</i>	<i>Total green mass production (to)</i>	<i>ZAF</i>	<i>UVM charging ha⁻¹</i>	<i>Total</i>
1	2	3	4 (col 2 * col 3)	5 (col 1 * col 4)	6 (col 4/0.05)	7 (col 6/DSP)	8 (col 1 * col 7)
162.4	9	100	9	1,461.6	180	1.12	181.88

ZAF - number of days/animal fed on pasture; DSP - length of grazing season; 0.05 - the amount of green mass, in tons, actually consumed by one UVM day⁻¹.

After the methods of permanent pastures improving were applied, much attention should be paid to the use of grass production, both by direct animal grazing and by mowing to preserve it for the cold season. The description of the parcel is given in Table 4 below.

Table 4

Parcel's description

<i>A.T.U.</i>	<i>Meadow type</i>	<i>Descriptive parcel</i>	<i>Surface (ha)</i>	<i>Category of use</i>	<i>Relief unit</i>	<i>Configuration</i>
I.C.D.C.O.C. PALAS	I, II	BF	162,4	Ps, Fn	terrace	uniform
Altitude: 430		Region: N	Inclination: plane		Soil: Planosol, Luvosol	
Parcel description sheet						
Type of meadow: 4.4.2.1.						
Grass: <i>Agrostis tenuis</i> , <i>Festuca pratensis</i> , <i>Phleum pratense</i> , <i>Deschampsia caespitosa</i>						
Legumes: <i>Trifolium repens</i> , <i>Lotus corniculatus</i>						
Various plants: <i>Achillea millefolium</i> , <i>Menta piperita</i>						
Harmful plants (weeds): <i>Deschampsia caespitosa</i> , <i>Ranunculus acer</i>						

Degree of vegetation coverage of the plot: 98%		
Livestock	First year	The rest of the years
	0.83	1.12
Woody vegetation: poppy, pigeon, hawthorn		
Works performed: annual maintenance works		
Proposed works: clearing of non-valuable woody vegetation, weed control, destruction of <i>Deschampsia caespitosa</i> bushes and bushes with milling cutter, fertilization, application of amendments in a dose of 10-15 to ha ⁻¹ , overseeding after milling and weeding, rational weeding		

The aim of pastoral arrangements is to organize, in time and space, the herbaceous production from the meadows and to establish by Decisions of the Local Councils of the A.T.U.s, according to the local stationary conditions and the incidence of agri-environmental measures, certain provisions to ensure their rational management while targeting biodiversity maintenance and environmental protection.

The pastoral arrangement is a complex work, having as objectives:

- inventory of permanent pastures included in the pastoral fund of the territory of the Administrative Territorial Unit (A.T.U.);
- studying the characteristics of the pastoral fund that is being arranged;
- providing the necessary documentary material for the planning of the improvement works/improvement of the meadows and the management of the pastoral fund.

At a national level, such projects have been carried out on pastoral planning in most of the A.T.U.s in several counties, of which we mention:

- Cluj County, Aghireșu A.T.U. – on May 7, 2020, the Local Council of the commune consented to the elaboration of Draft Decision no.12 on the approval of the conditions for the organization and development of grazing within Aghireșu commune during the 2021-2022 period;
- Bacău county - a statement from April 16, 2021, shows that "Carrying out pastoral arrangements at A.T.U.s in Bacău County - a solution for the maintenance and improvement of meadows and a condition for farmers to access specific subsidies."
- Prahova County - since May 28, 2015, the Local Council of Câmpina Municipality adopted Decision no. 61, by which the contracting of the service for the drawing up of the Pastoral Arrangement for the permanent meadows owned by the Municipality of Câmpina was approved. The explanatory memorandum shows that "the area of permanent pasture proposed for the study of the pastoral arrangement is 140 hectares.
- Arad county - at the A.T.U. of Secusigiu commune, the Pastoral arrangement project was carried out in 2020, for a total meadow area in the category of pasture use of 946.4696 ha.

More specifically, G.E.O. no. 34 of April 23, 2013, on the organization, administration and operation of permanent pastures and for amending and supplementing the Land Fund Law no. 18/1991, with all subsequent amendments and completions, provides the producers with means to increase the absorption rate of European funds, means that support animal breeders. These means include obligations of both central and local public authorities in the organization of public services for the administration and maintenance of both public and private meadows and pastures. Thus, the standards of efficient use of meadows and pastures are restored to comply with the provisions of article 10, paragraph (1) of Law no. 75 of April 25, 2019, but also of G.E.O. no. 78 of December 2019, for the amendment of art. 10 paragraph (1) of G.E.O. no. 34 of 2013: "...(1) In order to access the European funds related to surface payments, the users of meadows, natural and legal persons, as owners and/or legal holders of the right to use the land, must ensure a minimum load of 0.3 UVM ha⁻¹ annually on any of the days of the grazing period, or to mow the vegetation at least once a year. Starting with the year 2021, the application of the pastoral arrangement is obligatory".

Several producer organizations have already commented on the approval of the legislative initiative, saying that it is a step in the right direction, but other things need to be changed at the level of local public authorities for this to work. Moreover, people's reluctance to adapt to changes imposed by new legislation must also be overcome.

Through the diversity of plant and animal species, permanent grasslands ennoble and beautify the environment.

Conclusions. The method of administration of permanent meadows belonging to a locality represents the way in which the management of a meadow is ensured, namely the organization, administration and exploitation of permanent meadows, in which case all the problems as well as their solutions are included in the "Pastoral Development Projects". The main objective for the development of grasslands is to increase the total production and the quality of fodder, in accordance with its optimal conversion into animal products as a result of a good utilization of these areas. At the "Experimental Base Reghin" belonging to I.C.D.C.O.C. Palas Constanța, the following operations are carried out: mechanical cleaning of non-valuable woody vegetation; mechanical control of mosses covered with pasture milling; weed control works - manual and chemical; improvement works consisting of organic and chemical fertilization, weeding (action of fertilizing a meadow), overseeding, etc. The green mass production is related to the ration needed for a large cattle unit (UVM) and leads to an increase in grazing capacity from 0.83 to 1.12 UVM ha⁻¹. These could be a model for other farms of this type to follow and implement.

Conflict of interest. The authors declare no conflict of interest.

References

- Decision no. 78/2015 on amending and supplementing the Methodological Norms for the application of the provisions of the Government Emergency Ordinance no. 34/2013 on the organization, administration and operation of permanent grasslands and for amending and supplementing the Land Fund Law no. 18/1991 approved by Government Decision no. 1064/2013 - including the Framework Guide for pastoral arrangement.
- Emergency Ordinance no. 78/2019 of 18 December, 2019, on amending certain normative acts and establishing measures in the field of agriculture, as well as for the approval of fiscal-budgetary measures.
- Emergency Ordinance no. 130/2021 of 17 December, 2021, on some fiscal-budgetary measures, the extension of certain deadlines, as well as for the modification and completion of some normative acts.
- Government Emergency Ordinance no. 34 of April 23, 2013, on the organization, administration and operation of permanent pastures and for amending and supplementing the Land Fund Law no. 18/1991.
- Guide for drawing up pastoral arrangements - developed in 2014 by the Research and Development Institute for Meadows Brașov, published by Capolavoro Publishing House Brașov.
- Law no. 75 of April 25, 2019, for the amendment of the Emergency Ordinance no. 34 of April 23, 2013 on the organization, administration and operation of permanent pastures and for amending and supplementing the Land Fund Law no. 18/1991.

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