

THE DYNAMIC OF THE PASTURES AND HAYFIELDS SURFACES IN BASARABIA AND THE REPUBLIC OF MOLDOVA

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Keywords: land use, pâturage, hayfields, croplands, conservation.

Résumé: L'évolution des surfaces de pâturage dans la Bessarabie a été dans une dépendance directe de l'extension des terrains arables. Les plus grandes réductions des surfaces de pâturage a eu lieu dans la deuxième partie de XIX^e siècle (une réduction de 3,6 fois). Dans toute la période analysé (de 1812 à 2006), ces surface se sont réduits de 2400 milles hectares jusqu'au 373,4 milles hectares, c'est-à-dire, un réduction de 6,4 fois. Dans cette période s'est réduit et le degré d'assurance des animaux avec les pâturages, de 1,5 hectares par animal au 0,5 hectares, l'indicateur qui est de 2 fois plus petit que la norme admissible. Dans l'avenir, il est nécessaire d'augmenter la surface de ces catégories de territoire.

The pastures and the hayfields look like each other, especially considering their common usage, but still they are different taking into consideration their origin, morphology and the way of maintaining. Thus the pastures represent naturally or artificially grassed or fallowed areas, by replanting them in periods from 3 to 10 years, used for animal pasture, but the hayfields represent grassed (naturally or by cultivating) areas that are used to obtain hay after mowing. They are part of a rural locality, not cultivated, not worked by men and on which the grass is growing naturally, and are used as pastures [6, p. 172]. In some regions they represent areas of natural vegetation (steppe), without being agriculturally used.

The evolution of the level of provision with pastures and hayfields for the entire period analyzed reflects directly the evolution of the cattle number and the extension of croplands that was done only on the base of natural pastures. (Fig. 1 and 2). The majority of the surfaces with pastures and hayfields were concentrated in the steppe regions of Bugeac and Balti.

In the first half of the 19th century an insignificant decrease occurred, the main agricultural branch being cattle growing practiced on natural pastures. The rapid population growth, especially of the colonialists from south Basarabia, the

development of trade with cereals and the decrease of the cattle products export from the 6th and 7th decade of this century caused massive turn up of the pastures. [5, p. 231]. So, during 1812-1850 the pastures surface decreased from about 2200 thousand hectares (48.8 % of Basarabia) to 2040 thousand hectares [3, p.169], and in the next 50 years it decreases 3,4 times and reached the level of 596,5 thousands hectares in 1990. In 1961 the share of the croplands was already equal with the share of pastures (about 34.6 %) and in 1900 this ratio was about 3.6 times in favor of croplands. Thus the share of this category of land use decreased from 45.2 % to 17.3 % of the total surface (fig 1).

In the first decade of the 20th century, in the northern part of Basarabia (Hotin district and the northern part of the Soroca and Balti districts), there were not so many hayfields and pastures. The share of hayfields was from 1% to 5 % of the total surface, and the pastures – from 5% to 15%. In the southern part, the Chernozem Region of the Balti Steppe, the surface of the pastures and hayfields was bigger. A decrease of the pastures share from west to east is noticed. The pastures decreased from 30% to 5% and the hayfields from 15% to 1%, sometimes lower.

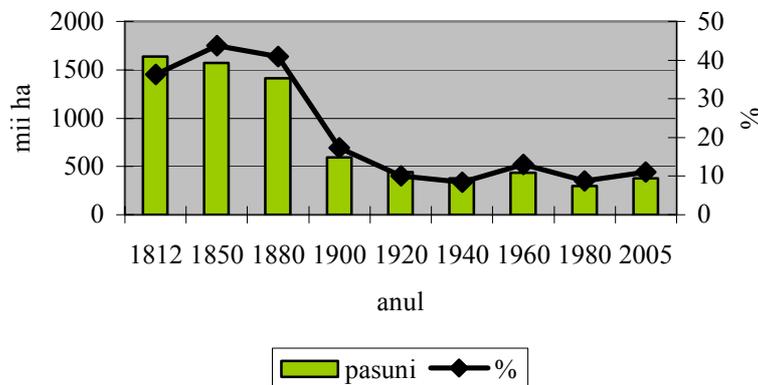


Fig. 1 - The dynamic of the surface and share of pastures and hayfields on the territory of Basarabia and Republic of Moldova

In the *Steppe with Forests Region* (southern part of Balti district, south-eastern part of Orhei district, almost the whole Chisinau district and the northern part of the Tighina district), the pastures occupied, in the western part – up to 15 %, in the eastern part – up to 5 % and southern- up to 25 %. The share of hayfields was higher in the northern part – 8 %, in southern part up to 1 % and less.

On the whole territory of Cahul district, the southern part of Tighina district and the north-eastern part of Cetatea Alba district, in the *chernozem with clay-*

sand subsoil region, the share of hayfields varied between 1% and 5%. On the territory of Ismail district and the southern part of the Cetatea Alba district, in the *chestnut chernozem soil zone*, the surface of pastures varied between 10% and 27%. The hayfields occupied less than 1%.

Up to 1920 the turn up of the pastures has continued when all the favorable parcels were used. The surface of the pastures and hayfields decreased up to 442.5 thousands hectares, thus their share was 10% of Basarabia. In 1914 everything that could be turned up was already turned up, and in some districts the share of pastures decreased to less than 6% of the whole surface [3, p. 135-136].

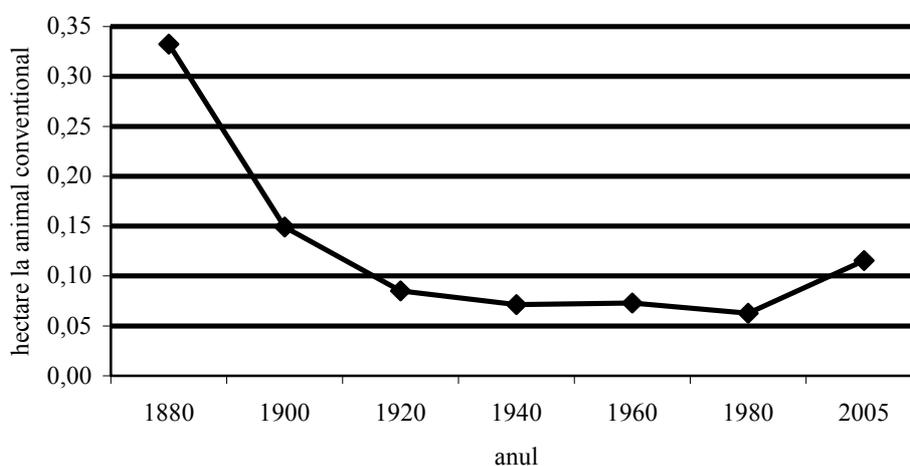


Fig. 2 - The evolution of assurance with pastures and hayfields on the territory of Basarabia and Republic of Moldova

During the inter-war period, the surface of these parcels has decreased again up to 374.5 thousands hectares and their share decreases to 8.4% (the minimal share for this territory).

In the first decades after the World War II, the surface of the pastures has increased and reached the level of 438 thousands hectares (13%) in 1960. The main reasons are:

- The forced cede of the southern part of Basarabia to Soviet Ukraine;
- Implementation of reconstruction policy by the soviet authorities.

Afterwards, the process of pastures and hayfields decreasing continued, and up to 1980, it marks another minimum of 298.2 thousands hectares (8.8%). In the '80, in spite of all the efforts of the ecological authorities in regard to conservation

and protection of natural ecosystems and because of the priorities of the Union Food Program, thousands hectares of parcels were turned up and drained, especially the territories close to the river meadows. This caused the worsening of the meadow parcels quality. [10, p. 166]. Territories with a high inclination or with a petrographic layer favoring erosion were introduced in the agricultural system. As a result, the parcels deeply eroded, including those occupied by gullies and intensive landslides.

In the last 15 years the pastures surface has increased with 20 thousands hectares, and made up at 01.01.2006 – 373.5 thousands hectares (11%). The process of pastures and hayfields extension is spontaneous and uncontrollable, that is taking place due to transferring of degraded parcels.

It should be mentioned that in the Republic of Moldova, all the hayfields had been liquidated. If in 1850 they made up 1404 thousands hectares or 39 % of the total surface [3. p.169], then in 1900 their surface has reduced 19 times, up to 2.1% of the total surface (72.7 thousands hectares). In 1950 they practically disappeared (0,09%).

Taking into consideration the geographical aspects, the pastures have a highest share in the regions with a fragmented relief and not used for plowing - the Ciuluc Hills (about 20%), the Codri Plateau in the limits of the Cula river basin (about 17%), the Sarata Depression (about 15%) or in those with low altitudes and plan relief, where an excess of humidity is registered – Middle Prut Plain (approximate 16%).

In three villages, the frequency of pastures is 36 % - Sirma (Leova district), Tiraspol and Molochisul Mic (Transnistria).

High shares of the pastures surfaces (24%-49%) is registered in 23 villages (2.3 % of the total number), including:

- 6 in Singerei district (Alexandreni, Heciul Nou, Biliceni Vechi, Ciuciuleni, Iezărenii Vechi and Bursuceni);

- 4 in Ungheni district (Tescureni, Agronomovca, Napadeni and Cornova) and 3 in Falesti district (Musteata, Iscalau and Bocani).

In 13.4 % of villages (132), the share of the pastures and hayfields is high, between 17% and 23%. The most of them are concentrated in Ungheni district (16), Straseni (13), Falesti (12), Leova (10), Orhei (8), Telenesti, Riscani and Cantemir (7 villages for each).

In 28, 5% of villages (280 of the total number), the share of the pastures is between 12% and 16%. Mostly they have the same spatial repartition as in the

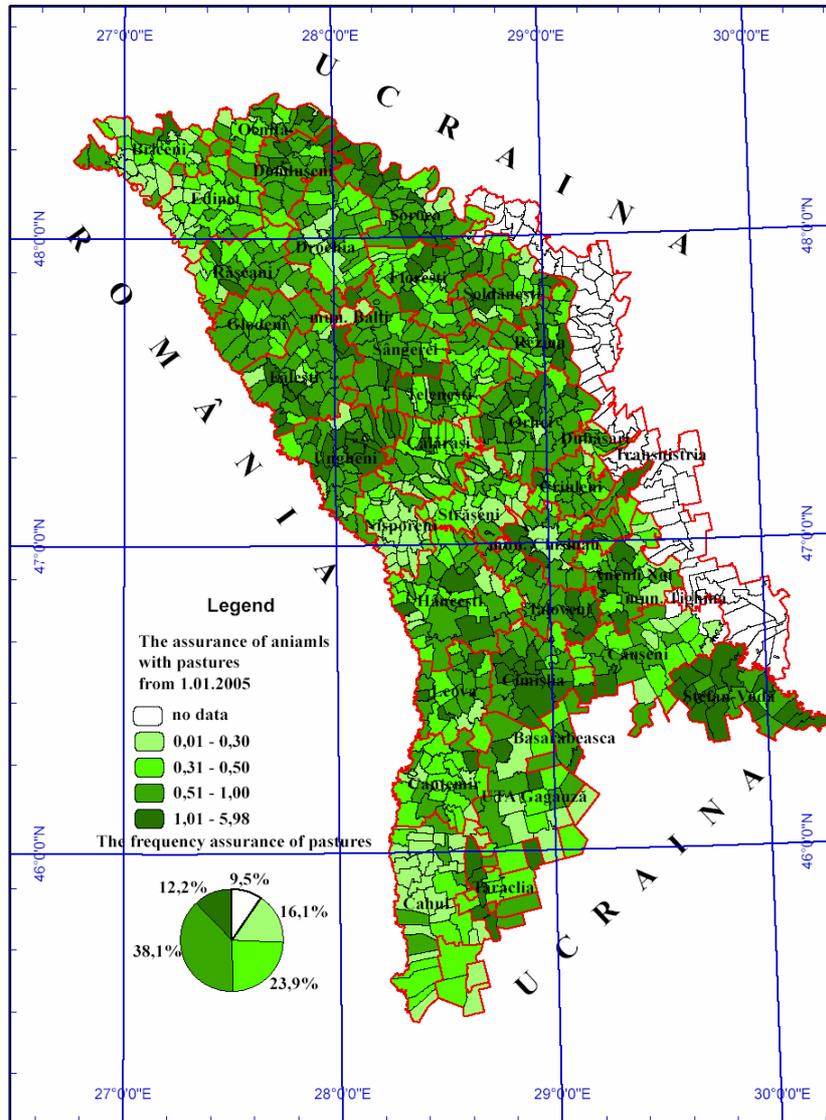


Fig. 4. The assurance of animals with pasture⁸

⁸ Cadastrul funciar al R. Moldova la 1.01.2005; Anuarele privind calitatea factorilor de mediu și activitatea Agențiilor Ecologice, 2006

previous group. So, in 44.2% of the total number of villages, the pastures share is higher than the average value for the republic (fig. 3).

The most numerous group is formed by the villages in which the share of pastures and hayfields is between 7% and 11%. They make up 35.5% of the total number of villages (349). A lower share of 7% is registered in 199 villages (20,3%), including 10 villages (of urban type) where pastures and hayfields are not registered at all. It should be mentioned that almost all the parcels covered with pastures are located in the river meadows.

The present study allowed the determination of the provision level of animals with pastures. This index represents the surface of the pastures that accounts for one conventional animal (one cattle= 1 horse = 3 sheep= 3 goats) [8, p.98]. So transforming the number of existing animals in 2005 in Moldova (311 thousands heads of cattle, 69 thousands heads of horses and 938 thousands heads of sheep and goats) [2, p. 357] into conventional animals we obtain 693 thousands heads. Thus, a conventional animal accounts for approximate 0.54 hectares of pastures. For the Republic of Moldova, this index is two times lower than the norm, the optimal degree of provision with pastures for one conventional animal being 1 hectare [8, p.98]. In the last years this index is increasing, due to reduction of the animal number (with 213 thousands conventional animals in the last 8 years), as well as to extension of the pastures surface.

Spatially (fig. 4), only 12% of the villages are provided with enough surfaces for animal pasturing (above 1 hectare of pastures per conventional animal). The most of them are located in the river meadows, where an excess of humidity is registered (Lower Prut Plain, Lower Nistru Plain), as well as in the regions where the vegetation is spontaneous (Balti Steppe, Bugeac Steppe), on the parcels where are obtained large quantities of green mass and that are not favorable for plowing.

The lowest shares are registered in the regions with fragmented relief (Codri Plateau, Colinele Tigheciului) where this index decreases to 0.5 hectares to a conventional animal. In the regions where the arable areas have a higher frequency (Lower Prut Plain, Cahul Plain, the western part of the Northern Moldova Plateau) the provision with pastures is higher (up to 0.8 hectares).

The intensive pasturing and the big number of animals to a unity of surface led to degradation of these categories of parcels. All this changes led to decrease of the phreatic water level, to modification of its mineralization degree and to desertification. In order to maintain their floristic equilibrium and the high productive potential (of about 850 kg/ha), it is recommended the alternative usage of the pasture and hayfield regimes.

In the agricultural production system, that assures only 5% of the production costs and slightly increased in the last 4 years (from 2% in 2001 to 5% in 2004) [2, p. 339]. The average productivity of the pastures in the republic varies

according to the area they are located. The highest productions are obtained in the flood plains – 23 tones of green mass per hectare. On the plain territories in conditions of humidity shortage, the productivity decreases to 15 tones of green mass per hectare [8, p.97].

Conclusions:

- the areas occupied by the pasture and hayfields suffered the biggest changes, as they reduced during 1812-2005 years from 2200 thousands hectares to 370,8 thousands hectares;
- nowadays hayfields almost totally disappeared, their surface decreased from 1404 thousands hectares to 2,1 thousands hectares;
- the reduction of this categories of parcels has a negative impact on the ecological stability;
- the increased human impact on pastures by turning them up and intensive pasturing led to significant degradation of these categories of parcels. Due to this reasons the sustainable management of them becomes a foreground task of our country and of local communities.

In order to conserve and to protect the pastures the following are recommended:

- to create environment stabilization areas, dominated by herbs;
- to take out of agricultural usage the degraded parcels and to sow them with herbal species;
- to rational use the pastures as fodder resources and to avoid the over pasturing;
- to establish a parceled pasturing.

In the future it is strictly necessary to extend this category of parcels, mostly on the parcels with excessive humidity (Lower Prut Plain, Lower Nistru Plain), as well as parcels with humidity shortage, but that in the past occupied big surfaces (Cubolta Plain and Southern Moldova Plains). In present, the extension may be done basing only on the arable inferior quality parcels. Also for pasturing are suitable salty soils. The pastures and the hayfields must be extended on the territories covered with useless wooden vegetation too (shrubs, bushes).

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