

# ANALYSIS OF MOUNTAIN PASTURES ON ECOLOGICAL SCALE (IN THE CASE OF MOUNTAIN PASTURES OF SOUTHERN UZBEKISTAN)

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## Abstract

Ecological studies of pastures and their restoration have been carried out in several countries. Space-based grassland monitoring in New Zealand is explored by Dave Clark, Annette Litherland, Gonzalo Mata and Robert Burling-Claridge. 20% of the farming budget is covered by pastures, and raising this figure to 50% is one of their main goals [21;22].

## Introduction

In California, 52 species of grasslands are managed according to 4 categories. These are:

1. Meadow grass.
2. Broad-leaved grasses. 3. Sour pasture grasses.
4. Irrigated broadleaf pasture [21].

S. Spigal, J. Bartolome and M. Vayt analyzed the issues of placing plants in pastures according to their adaptive characteristics for the restoration of California landscapes and developed practical ecological concepts [1; Pp.365-370].

In addition, R.Evit and J.Bartholome studied the issues of preserving the historically formed nature in the development of the livestock network, improving the condition of grasslands [2; Pp.1644-1649].

Rand R. Evett, Arthur Dawson, and James W. Bartolome assessed the plan of measures for the restoration of the ecological condition and the current state of the vegetation cover on the coast of Northern California through the density of plants in the surface layer of the soil [3; Pp.464-473.]. Also, analysis of ecological survival strategies in plant populations has been studied by scientists such as Huang, Ganlin, and Jonathan K. London in the case of the San Joaquin Valley [4; Pp.1593-1608.]. Foreign scientists such as Imbach P., Manrow M., Barona E., Barretto A., Hyman G., P. Ciais study the processes of improper use of pastures around the Amazon and compare their current state [5; Pp. 898-916.]. Johansen L., Wehn S., Kallioniemi E., Westin A., Lennartsson T., Iuga A., C.M. Ivascu develop traditional

methods of semi-natural grassland management in agricultural landscapes [6; Pp. 1-14.]. Wang C., Meng F., Li X., Jiang L., S. Wang determine the factors that indicate the initial productivity of grasslands [7; Pp.4125-4132]. Vanselow K.A., Kraudzun T., C.Samimi provide information on cattle grazing and productivity of pastures in Eastern Pamir [8; Pp. 324-336.]. Abaturov B.D., Kazmin V.D., Dzhapova R.R., Ayusheva E.C., Dzhapova V.V., Nokhaeva D.V., Kolesnikov M.P., Minoranskiy V.A., and Y.E. Kuznetsov provide scientific information about grazing of camels in pastures and ways of efficient use of pastures [9; Pp. 961-972].

Haddad M., Strohmeier S., Rahbeh M., Nouwakpo S., Al-Hamdan O., and M.Weltz study the stages of sustainable land use and degradation [10; P. 523]. McGwire K., Weltz M., Snyder K., Huntington J., Morton Ch., and McEvoy D. evaluate early spring cover crop use conditions in Nevada [11; Pp.730-739]. A. Saparov reveals a sustainable strategy for the use of sustainable soil and plant resources in the Republic of Kazakhstan [12; Pp. 611-619.]. Robinson S., Kerven C., Behnke R., Milner-Gulland E.J., and K. Kushenov analyze the characteristics of socio-economic and biophysical changes in animal husbandry [13; Pp. 169-182]. Alimaev I.I., R.H. Behnke justify the stages of mobility and efficient use of land in Kazakhstan [14; Pp. 151-178.].

As a result of overgrazing of livestock in Karakul and Zomin semi-desert regions of Uzbekistan, the productivity of blue grass was 0.17 and 0.3 tons per hectare. UN projects estimate that 55% of land in Karakul and 75% of land in Zamin are degraded [15; pp. 1-41].

In the Central Asian countries, the reduction of forests is happening primarily under the influence of anthropogenic factors. Since 1996, 1 million hectares of forest area was lost. However, in Central Asia, forests are 28% in Uzbekistan [16; p. 119.].

The practical use of pastures is primarily focused on monitoring fodder yield, that is, cartographic data gives good results. To determine the fodder productivity of mountain pastures during the year in the spring, field work is carried out through principled methodical schemes: drawing up a pasture card as a benchmark describing the average productivity indicators of many years; carrying out surface field inspections for control in the most important grazing areas; annual inspections for the use of pastures as fodder and grazing of livestock.

The map of upland pastures of the Kashkadarya basin serves as a standard for monitoring the ecological condition of fodder plants and when to feed livestock [17; pp. 12006-12017; 18; pp. 93-98; 19; pp. 35-38; 20; P.21].

The results of the field research conducted on the inventory of pastures carried out in Chirakchi, Kitab, Dehkanabad districts show that as a result of monitoring the dynamic state of pasture plant cover, it was found that the pasture areas have expanded over the last 15 years. Pasture areas increased from 1321625 to 1408358 from 1998 to 2017. However, the cultivated pastures occupy the main place in Guzor and Dehkanabad districts. During one year, the area of open land increases by 10,000 hectares due to unplanned grazing of livestock.

It was found that the following weeds are growing in all communities in the fields discovered in the adyr region: *Acrotilon repens*, *Verbascum songoricum*, *Cichorium intybyis*, *Artemisia scoparia*, *Turgenia latifolia*, *Vexibia pachycarpa*, *Rlantago lanceolata*, *Dodartia orientalis*, *Lactuca scariola*, *Convolvulus arvensis*, *Alhagi pseudalhagi*, *A. sporsifolia*, *Carthamnus oxyacanthuyu*.

In the composition of degraded many pastures (farm, village, well, land near the road), the bushes of more edifice species (*Acrotilon repens*, *Poa bulbosae*, *Aegilops cylindrica*) coincided with the senile-senescence period and formed regressive conditions. Reproduction from seeds was almost never found in them.

Such plant communities formed more transformed areas and were shown on the map with conventional symbols.

In order to prevent and reduce the breeding process, it is necessary not to increase the number of livestock and to alternate use of pasture land. According to experts, 1 livestock should be grazed on 4 ha during the year, but currently

4 livestock are grazed on 1 ha.

## Results and discussion

L.G. Ramensky (1925) [124; C.2-37.] developed ecological scales. The following are taken into account: aridity, change of aridity, active richness and salinity of soil, alluviality, pasture digression (change of vegetation as a result of livestock grazing).

Excessive unplanned livestock grazing leads to unfavorable vegetation composition and is known as pasture digression. The following steps (stage, level) of the pasture digression scale are distinguished:

- 1-2. Livestock grazing is very weak (meadow, large and broad-leaved grasses grow).
- 3-4. The grazing effect is weak.
5. Grazing effect is moderate (semi-pasture stage, pasture weeds appear and begin to grow, gramineae).
- 6-7. Strong influence of grazing (pasture stage, understory conifers dominate, lower ground cover leguminous plants are present, perennial weeds are abundant).
8. Premature emergence (large gramineae plants are much reduced, perennial weeds have increased and crowded out gramineae grasses, grasses have decreased, replaced by foreign annuals).
9. Degraded (grasses are strongly reduced and other annuals grow).
10. Fully degraded (soil surface is exposed, single plants grow).

On the basis of the above ecological scale, a classification of geobotanical description of degradation was developed. According to it, the following gradations were adopted for the density of plants: plants are common (>8 %) – c, abundant (2.5-8.0 %) – a, average (0.3-2.5 %) – a, few (0.1-0.2 %) – f, separate (seldom) (<0.1 %) – s.

Studies have shown that weak, moderate and strong degradation processes of mountain pastures of the Kashkadarya basin (Chirakchi and Dehkanabad districts) are observed. Average natural vegetation cover in spring is 50-60%, and in summer it is 30-33% or less, depending on the degree of degradation. It should be mentioned that the number and density of *Capsella bursa pastoris*, *Medicago lupulina*, *Poa pratensis*, *Polygonum aviculare*, *Bromus tectorum*, *Equisetum arvense*, which means gross and abundant digression, are increasing in the pastures in areas where irrigation agriculture is developed (Table 1).

Table 1 Indicators of digression of pasture areas with developed irrigated farming in the Kashkadarya basin

Indicator species	Pasture digression scale				
	common (more than 8%)	abundant (2.5-8 %)	average (0.3-2.5 %)	few (0.1-0.2 %)	separate (seldom)
	<i>M</i>	<i>c</i>	<i>n</i>	<i>p</i>	<i>s</i>
<i>Capsella bursa pastoris</i>	8	7-8	6-9	5-9	3-9
<i>Bromus tectorum</i>				6-7	5-7
<i>Chenopodium album</i>			7	7-8	7-8
<i>Cichorium inthybus</i>			6-7	3-7	2-8
<i>Convolvulus arvensis</i>			1-6	1-6	1-8
<i>Equisetum arvense</i>		2-3	2-4	1-4	1-5

Hypericum perforatum					1-3
Medicago lupulina	9	4-9	2-9		
Plantago lanceolata			3		
Poa pratensis	6-7	3-7	1-7	1-8	
Polygonum amphibium			1-4	1-4	1-5
Polygonum aviculare	7-8	7-8	7-9	5-9	
Prunella vulgaris		3-5	2-6	1-8	1-9
Taraxacum officinale		5-	4-8	2-8	1-8
Trifolium pratense		2-5	1-7		
Trifolium repens		6-7	5-8	1-8	

In the region, the number of color plants in less planted areas is around 2000-2200 per 1m<sup>2</sup>, and in heavily planted areas, it contains 20-40 plants.

## Conclusion

In meadows, the average productivity in the dry mass of meadows is 2 c/ha in spring, 1.2 c/ha in summer, 2.6 c/ha in autumn and 1.8 c/ha in winter. When the weather is unfavorable, these indicators change: in winter 0.4-1.1 c/ha, in spring 1.4-2.2 c/ha, in summer 1.0-1.6 c/ha, in autumn 0.6 -1.1 c/ha. When the weather is unfavorable again, the productivity decreases very quickly: in spring - 0.8; -2.2 c/ha in summer; in autumn it is -1.1 and in winter - 0.2 c/ha. These data show that meteorological conditions lead to reduced pasture productivity.

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