Priority Directions of Effective Use of Pasture Land in the Republic of Uzbekistan

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Abstract:

The article describes the issue of priorities for effective use of pasture land in the Republic of Uzbekistan. In particular, on the example of Karakol-breeding network, opinions were expressed on the preservation of ecological and natural environment of desert-pasture areas, restoration and development of biodiversity. As a result of the research, scientific proposals and practical recommendations on the effective use of pasture lands have been proven by the author through mathematical methods.

Keywords: pasture, animal husbandry, Karakol breeding, ecosystem, resource-efficient development, degradation, biodiversity, mathematical methods, economic efficiency.

INTRODUCTION. In recent years, great attention has been paid to the modernization of the livestock industry in the Republic of Uzbekistan. First of all, to further increase the number of sheep of the Karakol breed and the volume of production of livestock products; improvement of breeding works on a scientific basis; deep processing of livestock products, raw materials and wide use for medical purposes; and issues of social support of network employees are considered important.

Deepening economic reforms in the Karakol breeding industry in our country, raising quality Karakol hides by improving breeding activities, establishing areas for sowing seeds of desert nutritious crops and increasing the productivity of pastures, as well as strengthening the material and technical base of Karakol breeding subjects. a number of positive things have been done in recent years. Nevertheless, not fully using the internal capabilities available in the network; expansion of the areas of seeding of desert pasture nutritious plants; production of export-oriented Karakol sheep and Karakol sheep leather; the state of deep processing of products and the use of raw materials for medical purposes does not fully meet today's requirements.

Due to the fact that the Karakol breeding sector is considered a unique, large sector of the agricultural sector, the President and the Government of the Republic of Uzbekistan adopted several related decisions on the modernization of the sector. In particular, the Decree of the President of the Republic of Uzbekistan dated February 7, 2017, No. PD-4947 "On the Strategy of Actions for the Further Development of the Republic of Uzbekistan" [1], Decree

No. PD-6059 dated September 2, 2020 "On measures to further develop cocoon and Karakol breeding in the Republic of Uzbekistan" [2], Resolution No. PQ-2841 of March 16, 2017 "On additional measures to deepen economic reforms in animal husbandry" [3], Resolution No. PQ-3603 dated March 14, 2018 "On measures for rapid development of the Karakol husbandry industry" [4], Resolution No. PQ-4420 dated August 16, 2019 "On measures for the comprehensive development of the piracy network" [5], Resolution No. PQ-4984 dated February 9, 2021 "On additional measures for the further development of the piracy network" [6], Resolution No. PQ-5178 dated July 8, 2021 "On additional measures to support the effective use of existing pastures in the Republic, processing of silk and wool" [7], as well as, Decree of the Cabinet of Ministers of the Republic of Uzbekistan No. 649 dated August 13, 2018, on "Organization of the system for the purchase, storage and delivery of sheepskin, Karakol skin and wool grown by subjects engaged in poaching to organizations of processing decision on measures" [8] were adopted.

LITERATURE REVIEW. It is worth noting that foreign scientists M.A. Vinogradova, Sh.R. Kherremov [9], O.Annageldyev, O.Annamukhammedov [10], H.Ukibayev [11], T.J. Nurumbetov [12], N.Z.Shamsutdinov [13] and Uzbek scientists T.S. Mallaboyev [14], R.Kh. Khusanov [15], F.K. Qayumov [16], F.J. Zorayev [17], T.Kh. Farmanov [18], A.J. Musagaliyev [19,20] as well as the others have conducted scientific research on the management of the karakol industry taking into account its specific characteristics, the storage, feeding, maintenance and other issues of karakol breeding in pasture-desert areas.

RESEARCH METHODOLOGY. A number of government decrees and decisions on the development of agriculture in Uzbekistan based on theoretical analysis and monographic observations, and in the "Roadmap" for the implementation of the specified tasks in the "Strategy of the Development of Agriculture of the Republic of Uzbekistan for 2020-2030", adopted on the basis of the Decree of the President of the Republic of Uzbekistan No. PF-5853 of October 23, 2019 [21] aimed at highlighting the importance of network programs developed to increase agricultural efficiency and intensify the production of socially important products.

ANALYSIS AND RESULTS. As a result of institutional reforms, structural changes and effective measures to develop the use of innovative and resource-efficient technologies and create an attractive environment for attracting investments, fundamental changes are being implemented in the karakul breeding sector.

One of the most important issues is the rational use of pastures as the main factor in the development of the Karakol-breeding network. The productivity of the pasture and preservation of biodiversity in it, the introduction of alternating use of pastures will increase the quality of the pasture and create the possibility of effective use in animal husbandry. Every Karakol breeding limited liability company or Karakol breeding farm should always be concerned about maintaining the balance between the capacity of sheep and the productivity of the pasture when using the pasture under their control.

In our study, we tried to determine the correlation between the productivity of cattle sheep and the productivity of pastures using the mathematical modeling method on the example of the cattle breeding network.

So, taking into account the seasons (t=1,2,3,4. t=1 spring), we will develop a model for the distribution of pasture areas by societies with limited liability for Karakol breeding. To do this, we enter the following conditional symbols:

t=1,2,3,4 – determines the spring, summer, autumn and winter seasons of the year;

j=1,2,..., m – Order number of Karakol breeding limited liability companies in the system of "Karakol" regional association, m – The total number of Karakol breeding limited liability companies in the system of the "Karakol" regional association;

i=1,2,..., n – Order number of Karakol breeding limited liability companies in the system of "Karakol" regional associations;

q(t)-t – the mass of fodder on the average area of 1 hectare of pastures in the season, t.;

e(t)-t – the average amount of forage required for 1 head of Karakol sheep in the season, t.;

$S_{ij}(t)$-t – in the season, the area of the pasture part allocated to j- Karakol breeding limited liability societies of i-"Karakol" regional association, ha;

$N_i(t)$-t – in the season i- the number of Karakol sheep in all societies with limited breeding responsibility of the "Karakol" regional association, units;

N(t) – the number of sheep in the area;

$C_{ij}(t)$-t – In the season i- "Korakol" territorial association's j-karakol breeding limited liability companies of 1 hectare of pasture area allocated for the expenses of raising sheep, thousand soums;

$Y_{ij}(t)$-t - the pasture area allocated to the j-breeding limited liability company of the i-"Karakol" regional association in the season, ha;

$Z_{ij}(t)$-t – the number of sheep grazed in the pastures of the i-"Karakol" territorial association j-breeding limited liability company during the season, units;

F(t)-t – Total expenses for the use of pastures allocated for limited liability breeding societies of "Karakol" regional associations in the season, thousand soums.

Using the above-mentioned indicators, we will consider the model of optimal allocation of pastures to limited liability breeding societies of "Karakol" territorial associations.

This model will look like this:

The objective function –

$$F(t) = \sum_{i=1}^{n} \sum_{j=1}^{m} C_{ij}(t) \cdot Y_{ij}(t) \longrightarrow \min \quad (1)$$

(for each season, the total costs for using the pastures allocated for limited liability breeding societies of "Karakol" regional associations should be the least). To achieve this goal, the following conditions must be met:

$$\sum_{i=1}^{n} \sum_{j=1}^{m} Y_{ij}(t) = S(t) \qquad (2)$$

(for each season, the total area of pastures allocated to all breeding limited liability companies of the "Karakol" regional association must be equal to the area of pastures allocated for that season);

$$\sum_{j=1}^{m} Z_{ij}(t) = N_i(t), i = 1,2,...,n \qquad (3)$$

(for each season, the number of sheep grazed in the pastures of all breeding limited liability companies belonging to the i-"Karakol" regional association should be equal to the total number of sheep belonging to the i-"Karakol" regional association) ;

$$\sum_{t=1}^{y} S(t) = S \qquad (4)$$

(the sum of the area of pastures divided by four seasons should be equal to the total area of pasture);

$$\sum_{i=1}^{n} N_i(t) = N(t) \qquad (5)$$

(the number of Karakol sheep in all "Karakol" regional associations should be equal to the number of Karakol sheep in the region);

$$Y_{ij}(t) \geq 0 \qquad (6)$$

(the allocated pasture area must not be negative);

$$Z_{ij}(t) \geq 0 \qquad (7)$$

(the number of fed sheep will not be negative).

In the above model will consist of the parameters Cij(t), N(t), S, n, m that are known, and Yij(t), Zij(t), Ni(t), S(t) are the parameters that are unknowns. This model consists of a linear dynamic model.

In order to simplify the above-mentioned model (1)-(7), we introduce a new variable (unknowns). Let's assume that Xij(t)-t is the amount of fodder (T) in the pasture allocated to the j-breeding limited liability company of the i-"Karakol" regional association in the season.

Then we get $Y_{ij}(t) = \dfrac{x_{ij}(t)}{q(t)}, \quad Z_{ij}(t) = \dfrac{x_{ij}(t)}{e(t)}$ relationship, and based on these, we make the model (1)-(7) look like this:

$$F(t) = \sum_{i=1}^{n} \sum_{j=1}^{m} \frac{C_{ij}(t)}{q(t)} \cdot X_{ij}(t) \longrightarrow \min, \qquad (8)$$

$$\sum_{i=1}^{n} \sum_{j=1}^{m} X_{ij}(t) = q(t) \cdot S(t), \qquad (9)$$

$$\sum_{j=1}^{m} X_{ij}(t) = e(t) \cdot N_i(t), i = 1,2,...,n, \qquad (10)$$

$$\sum_{t=1}^{y} S(t) = S, \qquad (11)$$

$$\sum_{i=1}^{n} N_i(t) = N(t), t = 1,2,3,4, \qquad (12)$$

$$X_{ij}(t) \geq 0. \qquad (13)$$

Now in this problem we consider Xij(t) unknown, in this case obtained relations (8)-(10) and (13) form a linear model and this problem is solved separately for t=1,2,3,4 will be solved.

However, it is necessary to take into account conditions (11) and (12). It should be noted that in this problem, the values of S(t) and Ni(t) satisfying conditions (11) and (12) (for all i and t), we got from solving the models (8)-(10) and (13). That is, it is necessary to know the area of pastures by seasons and the optimal number of Karakol sheep in each "Karakol" regional association.

Taking into account the last mentioned points, the issue of distribution of pastures between breeding limited liability companies is solved by determining Xij(t)-unknowns that satisfy relations (8), (9), (10) and (13).

After determining this unknown, we determine Yij(t) as follows:

$$Y_{ij}(t) = \frac{x_{ij}(t)}{q(t)}$$, i=1,2,...,n; j=1,2,...,m; t=1,2,3,4, i.e., the issue of distribution of pastures according to seasons to Karakol limited liability companies of "Karakol" regional associations will be resolved.

Preserving the naturalness of tens of thousands of pasture lands owned by Karakol Breeding Limited Liability Companies, engaging in pasture livestock without harming the flora is always an urgent issue. This creates an opportunity to improve the living conditions of millions of people living in pasture-desert areas, and to develop the livestock industry.

CONCLUSIONS AND RECOMMENDATIONS. In conclusion, research shows that in order to ensure the sustainable growth of the economy of the country's Karakol husbandry sector:

➢ implementation of structural transformation measures aimed at ensuring sustainable economic development in the industry (development of production-preparation-sorting-cleaning-processing and sale systems of karakol husbandry products, etc.) and development of its

organizational, economic and legal mechanisms, ensure social protection of all herdsmen at a high level;

➢ ensuring the material interests of karakol breeders and industry workers growing karakol husbandry products higher than their labor results;

➢ it is necessary to support the permanent employment of capable, educated young professionals based on the organization and development of infrastructure entities necessary to ensure the efficient operation of karakol husbandry farms.

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