STRUCTURAL CHANGES AND FEATURES OF TERRITORIAL SPECIALIZATION OF LIVESTOCK FARMING IN SAMARKAND REGION

Ibragimov Lutfullo Ziyadullayevich
Makhmudova Gulmira Khamidovna
Samarkand State University, Professor, Doctor of Geographical Sciences (DSc)
e-mail: ibragimovlutfullo@gmail.com
Samarkand State University, doctoral student
e-mail: otayorovagulmera@gmail.com

Abstract. This article examines the development of livestock farming in Samarkand region in 2010–2024 in comparison with the republic as a whole, based on regional data of the Statistics Agency. The chain index of the sector's real output, growth coefficients by type of product and the region's share in national production were calculated.

Keywords: Samarkand region, livestock farming, poultry farming, milk production, territorial specialization, farm types, food supply.

Annotatsiya. Mazkur maqolada Samarqand viloyati chorvachiligining 2010–2024-yillardagi rivojlanish yo‘li Statistika agentligining hududiy ma’lumotlari asosida respublika bilan solishtirib o‘rganilgan. Tarmoq real hajmining zanjirli indeksi, mahsulot turlari bo‘yicha o‘sish koeffitsientlari va viloyatning respublika hajmidagi hissasi hisoblab chiqilgan.

Kalit so‘zlar: Samarqand viloyati, chorvachilik tarmog‘i, parrandachilik, sut yetishtirish, hududiy ixtisoslashuv, xo‘jalik shakllari, oziq-ovqat ta’minoti.

Аннотация. В статье на основе региональных данных Агентства статистики рассматривается развитие животноводства Самаркандской области в 2010–2024 гг. в сравнении с республикой. Рассчитаны цепной индекс реального объёма отрасли, коэффициенты роста по видам продукции и доля области в республиканском производстве.

Ключевые слова: Самаркандская область, животноводство, птицеводство, производство молока, территориальная специализация, формы хозяйствования, продовольственное обеспечение.

Introduction. Meeting the population's demand for animal products is one of the central tasks of Uzbekistan's agrarian policy, and the contribution of livestock farming to this task continues to grow. According to official statistics, 2.94 million tonnes of meat (live weight) and 12.44 million tonnes of milk were produced in the country in 2024, almost twice the 2010 level [9]. Nevertheless, the sector's growth has slowed in recent years: whereas annual real growth was 6.7–8.0% in 2010–2016, it ranged from 1.6% to 4.0% in 2019–2024. The bulk of output (87.5% in 2024) is still produced by dehkan (smallholder) and household farms.

The territorial distribution of livestock farming is uneven, and Samarkand region holds a special position in the sector owing to its irrigated lands in the Zarafshan valley, high population density and large consumer market [1]. The role of market proximity and natural resources in the location of production was substantiated by J.H. von Thünen and N.N. Kolosovsky and, under the conditions of Uzbekistan, by A.S. Soliyev and other researchers. Although there are studies on the specialization of the region's agrarian sector, the reduction of land resources, urbanization, food self-sufficiency and

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clustering, the long-term structural shifts in the region's livestock farming have not been adequately assessed on the basis of consistent statistical series.

Aim of the study. To assess the quantitative and structural changes in the livestock farming of Samarkand region during 2010–2024 against the national background and to reveal the features of the sector's territorial organization.

Materials and methods. The study area is Samarkand region, which comprises 14 districts and 2 cities. Its natural conditions determine two types of specialization: the irrigated plain of the valley is suited to dairy and beef cattle breeding and poultry farming, while the foothill pastures of Nurobod and Qo'shrabot districts are suited to sheep and karakul breeding [1]. Regional data series for 2010–2024 from the official portal of the Statistics Agency were used [8, 9]. They cover the output of livestock and poultry meat (by species), milk, eggs, wool, karakul pelts, honey, silk cocoons and fish, as well as the total value of the sector's output and its distribution by farm category.

The average annual growth rate over the 14-year period was determined for each indicator as follows:

$$r = (Y_{2024} / Y_{2010})^{1/14} - 1, \quad (1)$$

where Y_{2010} and Y_{2024} are the values at the beginning and end of the period. To eliminate the effect of inflation on value indicators, the sector's volume was reconstructed as a chain index from annual growth rates at constant prices:

$$I_{2010} = 100; \quad I_t = I_{t-1} \cdot g_t / 100, \quad (2)$$

where g_t is the growth rate in year t (relative to the previous year, %). The region's position was assessed by its share in national output and its rank among regions, and the district-level structure by the 2020 data of [1]. Calculations and graphs were performed in Python. Since regional statistics do not report livestock numbers, the analysis is based on output volumes.

Results. As Figure 1 shows, livestock farming in the region and in the country grew along an almost identical trajectory until 2016. The divergence began in 2017: in 2017, 2019 and 2020 real growth in the region was 101.0%, 100.2% and 99.9%, respectively, i.e. it virtually stalled. As a result, by 2024 the regional index reached 191 points and the national index 200 points, with average annual real growth of 4.7% and 5.1%, respectively.

At current prices, the region's livestock output was valued at 25.1 trillion soums in 2024, ranking second after Kashkadarya region. Growth rates differ sharply by product (Table 1). The highest growth was recorded for fish (255-fold), poultry meat (8.1-fold) and honey (7.5-fold), whereas among traditional products eggs increased 2.4-fold, milk 1.9-fold and total meat 1.8-fold, while wool grew only 1.2-fold.

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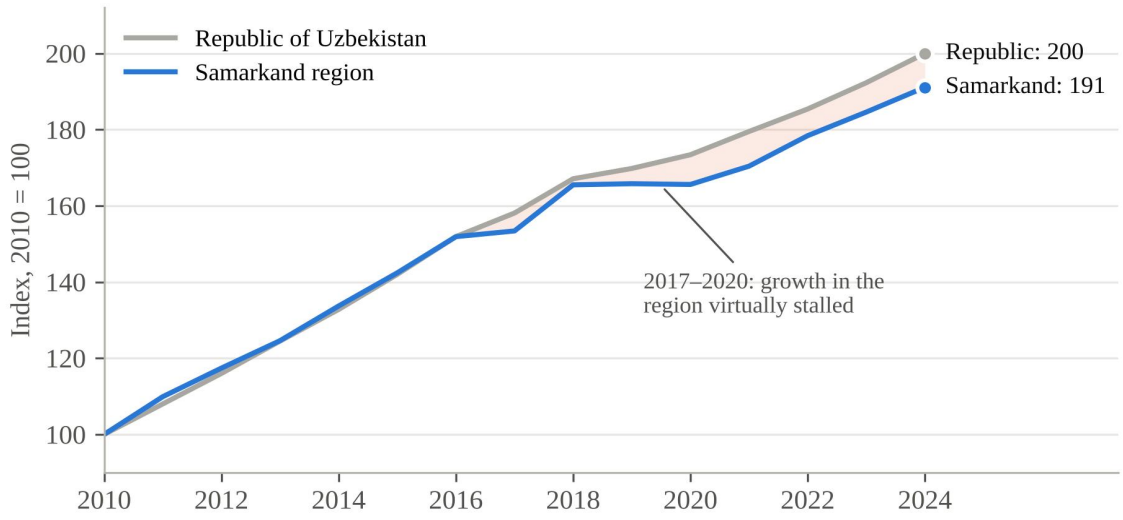


Figure 1. Dynamics of the real volume of livestock output (2010 = 100)
Source: compiled by the authors based on Statistics Agency data.

Table 1. Key indicators of the main livestock products of Samarkand region (2024)

Product	Volume, 2024	2024/2010, times	Share in national output, %	Rank among regions
Milk, thousand t	1,456.6	1.92	11.7	1
Meat (live weight), thousand t	325.7	1.81	11.1	2
cattle meat	224.9	1.53	10.5	3
poultry meat	54.9	8.07	**17.7**	2
Eggs, million units	1,367.1	2.37	**15.4**	2
Silk cocoons, t	3,879	1.45	**12.9**	2
Wool, t	4,154	1.21	10.4	4
Fish caught, t	20,648	254.9	**10.4**	4
Honey, t	1,359.5	7.47	**8.2**	7

Source: calculated based on Statistics Agency data. Bold figures – products whose share increased compared with 2010 or exceeds 15%.

The structure of meat production has been substantially reshaped (Figure 2). In 2010 cattle accounted for more than four-fifths (81.5%) of meat in live weight, whereas by 2024 their share had fallen to 69.1%. The vacated niche was taken mainly by poultry farming, whose share rose from 3.8% to 16.9%. The share of sheep and goat meat remained stable at around 12–15%, while pig farming virtually ceased after 2018.

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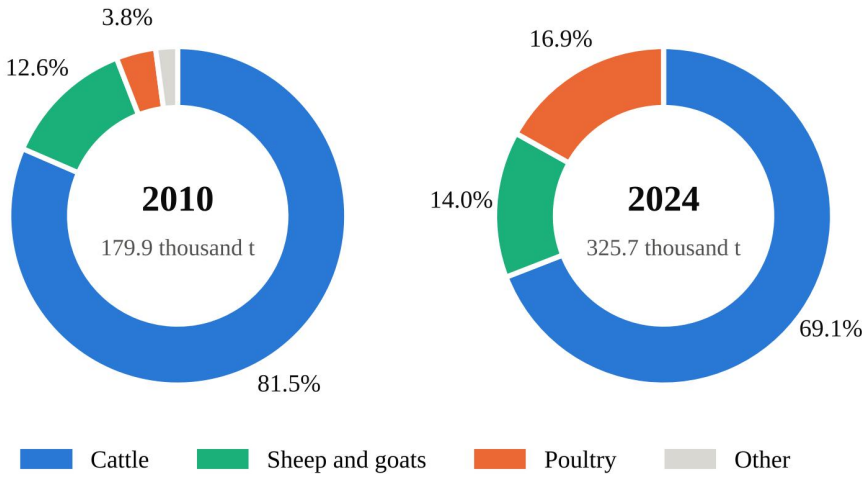


Figure 2. Species structure of meat produced in live weight, 2010 and 2024

Source: compiled by the authors based on Statistics Agency data.

The region's share in national output changed in opposite directions across products (Figure 3). It increased for fish (0.9 → 10.4%), honey, silk cocoons and poultry meat. In contrast, it declined markedly for eggs (18.8 → 15.4%), wool (13.0 → 10.4%) and especially karakul pelts (9.8 → 1.7%). Although the share in milk and total meat fell by about one percentage point, the region retains first place in milk (followed by Kashkadarya – 1,380.2 and Fergana – 1,191.2 thousand t) and second place in meat.

Within the region, livestock farming is organized according to two territorial models. Meat and milk production is dispersed across districts, with the largest share in Urgut district (15.1% of meat). Commercial poultry farming, by contrast, is point-concentrated: 63.4% of eggs are produced in Samarkand district, where large poultry factories operate. Pasture livestock products are concentrated in the foothill areas – Nurobod and Qo'shrabot districts account for 74.7% of karakul pelts and 43.9% of wool [1].

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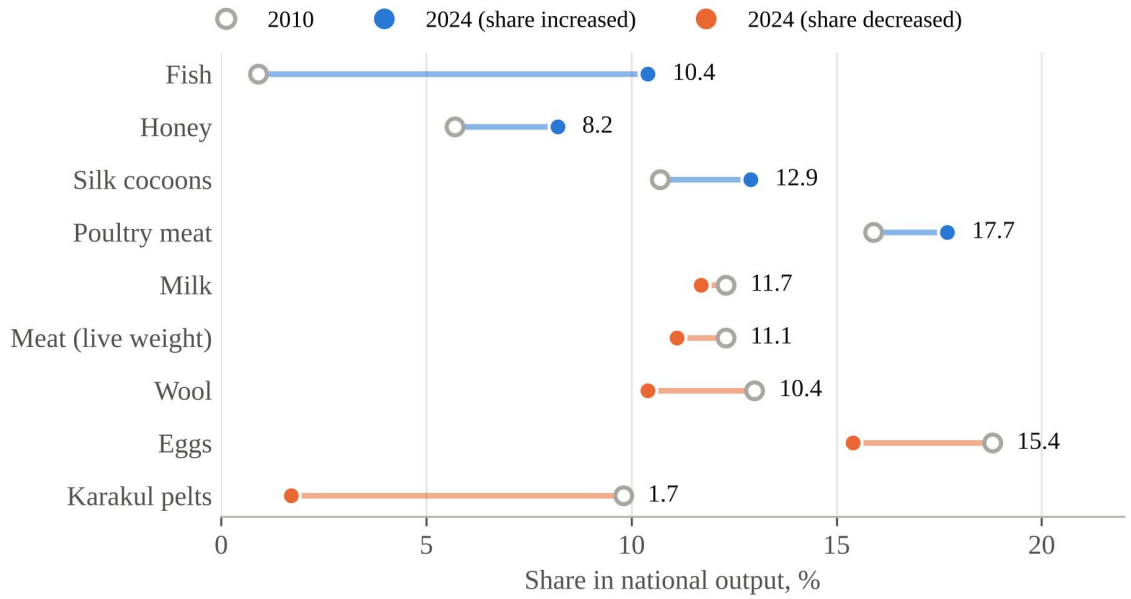


Figure 3. Share of Samarkand region in national output, 2010 and 2024, %

Source: compiled by the authors based on Statistics Agency data.

In the structure of farm types, the share of commercial (fermer) farms rose from 4.3% to 12.0%, almost twice the national level (6.6%). Nevertheless, dehkan and household farms remain the main producers, accounting for 84.7% of output (92.4% in 2010).

Discussion. The results show that growth in the region's livestock farming has been driven mainly by intensive, capital-intensive sub-sectors – poultry and fish farming. The considerably lower growth of cattle meat (1.53-fold) compared with the national level (1.92-fold) is explained by a limited feed base: the allocation of irrigated peri-urban land to construction and other needs is reducing the area under fodder crops. In addition, since most cattle are kept on small dehkan farms, improving breeds and productivity is difficult.

The concentration of poultry farming in a few enterprises makes the sub-sector sensitive to external factors: the decline in egg production from 1,426.5 million in 2018 to 1,198.5 million in 2019–2021 may be related precisely to changes in the operation of these enterprises. The fall in karakul pelt output from 91.2 to 23.1 thousand indicates the need to support pasture livestock farming in the foothill districts. A positive trend is the emergence of large integrated enterprises: the cluster in Toyloq district procures more than 150 tonnes of milk per day and has a processing capacity of 100 thousand tonnes of milk per year. Self-sufficiency ratios for milk and meat in the central districts are 2.91 and 4.28, confirming that these areas serve as the food base of the regional centre.

Conclusion. First, in 2010–2024 the real volume of livestock farming in Samarkand region increased 1.91-fold, but owing to stagnation in 2017–2020 the region lagged slightly behind the national growth rate. Second, the region ranks first in milk and second in meat, poultry meat, eggs and silk cocoons, remaining one of the country's leading livestock regions. Third, a clear structural shift from cattle breeding towards poultry farming has occurred in meat production. For sustainable development of

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the sector, it is advisable to strengthen the feed base, involve dehkan farms in cooperatives and clusters, improve cattle breeds, and restore sheep and karakul breeding on the pastures of Nurobod and Qo‘shrabot.

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