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SUSTAINABLE DIRECTIONS FOR ENHANCING THE EFFICIENCY OF FOOD INDUSTRY ENTERPRISES IN THE REGIONS OF KASHKADARYA PROVINCE

Abstract: This article provides a scientific-practical analysis of the sustainable directions for enhancing the efficiency of food industry enterprises in the regions of Kashkadarya province. The study examines the current state of the region's food industry, existing challenges, and development opportunities. Strategic directions such as the cluster approach, introduction of digital technologies, strengthening the local raw material base, and increasing export potential are substantiated. The recommendations presented in the article contribute to the sustainable development of the regional economy.

Keywords: food industry, efficiency, sustainable development, cluster, digitalization, export potential, Kashkadarya province.

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УСТОЙЧИВЫЕ НАПРАВЛЕНИЯ ПОВЫШЕНИЯ ЭФФЕКТИВНОСТИ ПРЕДПРИЯТИЙ ПИЩЕВОЙ ПРОМЫШЛЕННОСТИ В РЕГИОНАХ КАШКАДАРЬИНСКОЙ ОБЛАСТИ

Аннотация. *В статье представлен научно-практический анализ устойчивых направлений повышения эффективности предприятий пищевой*

промышленности в регионах Кашкадарьинской области. Рассматриваются современное состояние пищевой промышленности региона, существующие проблемы и возможности её дальнейшего развития. Обоснованы стратегические направления развития отрасли, включая кластерный подход, внедрение цифровых технологий, укрепление местной сырьевой базы и повышение экспортного потенциала. Представленные рекомендации способствуют устойчивому развитию региональной экономики.

***Ключевые слова*:** *пищевая промышленность, эффективность, устойчивое развитие, кластер, цифровизация, экспортный потенциал, Кашкадарьинская область.*

INTRODUCTION: The food industry, as a strategic sector of the economy, plays a decisive role in providing the population with high-quality and affordable food products. In the Republic of Uzbekistan, the development of agriculture and the food industry has become a priority direction of state policy in recent years, with the volume of investments directed to this sector increasing considerably.

Kashkadarya province is one of the economically significant regions of the republic. The province's favorable climatic conditions, abundant land and water resources, and agricultural potential create a strong foundation for the rapid development of the food industry. However, the insufficient technical and technological level of existing enterprises, the management system's incomplete adaptation to modern requirements, and the relatively low market competitiveness are hindering the effective development of the sector [1].

The "Development Strategy of New Uzbekistan for 2022–2026" approved by Decree No. PF-60 of the President of the Republic of Uzbekistan dated January 28, 2022, and the food industry development program established by Resolution No. PQ-4491 dated October 23, 2019, have defined the enhancement of efficiency of enterprises in this sector as a priority task at the state level. Based on these important documents, the systematic and consistent implementation of measures at the provincial level remains an urgent demand of the time [2].

The scientific-practical significance of the research lies in the fact that the sustainable directions proposed in the article are not merely theoretical in nature, but have been developed with full consideration of the distinctive economic, geographical, and resource potential of Kashkadarya province, encompassing specific mechanisms and tools that can be implemented in practice.

LITERATURE REVIEW: The issue of enhancing the efficiency of food industry enterprises has been extensively studied by foreign and domestic scholars. Porter M. (1998) developed the theory of forming competitive advantages based on the cluster approach, empirically proving that the geographical concentration of industrial enterprises improves profitability and innovation activity indicators by 23–31 percent [3].

Ansoff I.H. and MacDonnell E.J. (1990) emphasized the importance of balancing internal resources and the external environment in ensuring the strategic flexibility of an enterprise. Their findings are fully applicable to food industry enterprises as well, given that this sector operates in a highly competitive environment [4].

Among local researchers, Toshmatov A.T. (2021) studied the integration of agriculture and the food industry in Uzbekistan, demonstrating that the vertical integration model increases enterprise profitability by 15–20 percent [5]. Yusupov R.M. (2020) established a scientific foundation for improving the management system of food industry enterprises under digitalization conditions [6].

A study of advanced foreign experience shows that countries such as the Netherlands, Spain, and Israel, having established cluster structures in the food industry, achieved a two-to-threefold increase in export volumes within a few years. In China, the introduction of digital technologies under the "Smart Farm" program improved efficiency by more than 30 percent. These experiences can serve as an important methodological basis for Uzbekistan, including Kashkadarya province [7].

ANALYSIS AND RESULTS: As of 2025, 214 officially registered enterprises are operating in the food industry of Kashkadarya province. Of these, 78 belong to the category of large and medium enterprises, while 136 fall under small enterprises and

micro-enterprises. Although the production volume of the province's food industry has grown 1.8 times over the past five years, it still lags behind the national average by 12–14 percent [8].

Table 1.

Key performance indicators of food industry enterprises in Kashkadarya province[1]

Indicator	Years				
	2021	**2022**	**2023**	**2024**	**2025**
Number of enterprises (units)	178	185	196	206	214
Production volume (bln. UZS)	1 842	1 968	2 314	2 876	3 312
Export volume (mln. USD)	12,4	13,1	18,7	24,3	31,6
Average profitability (%)	8,2	7,9	9,4	11,1	12,3
Share of modern technology (%)	18	22	29	35	41
Employed workers (thousand persons)	14,3	14,8	15,6	16,4	17,2

As can be seen from the table data, a positive dynamic exists in the food industry of the province. However, the analysis shows that the level of technological equipment of enterprises is still insufficient — the share of modern technologies amounts to only 41 percent. This indicator represents a gap of 18–24 percent when compared with leading regions such as Tashkent and Samarkand [9].

Based on comprehensive monitoring and interviews conducted at food industry enterprises of Kashkadarya province, the following systemic problems have been identified:

1. Technical and technological obsolescence of production: in 59 percent of enterprises, the equipment depreciation coefficient exceeds 70 percent.
2. Instability of the raw material base: absence of long-term contractual relationships with local agriculture.
3. Low qualification of personnel: shortage of industrial technologists and food quality control specialists.

[1] Author's compilation based on data from the Statistical Department of Kashkadarya Province

4. Underdevelopment of marketing and export systems: only 9.5 percent of manufactured products are exported.

5. Financing problems: long-term investment credits are costly and difficult to obtain.

As the first and most important strategic direction, the formation of food industry clusters is proposed. The cluster model integrates agricultural raw material producers, processing enterprises, trade and sales organizations, and scientific-educational institutions into a unified coordination system. Taking into account the geographical and economic structure of Kashkadarya province, it is advisable to establish three specialized clusters in the following directions:

– Karshi-Koson food cluster (grain and flour products, oil and fat industry);

– Shahrisabz-Guzor fruit and vegetable processing cluster (canning, drying, freezing);

– Muborak-Kamashi livestock and dairy products cluster.

According to calculations, within the first 3 years following cluster formation, member enterprises are expected to see their costs decrease by 18–22 percent, while production volumes are projected to increase by 25–30 percent [10].

The implementation of digital transformation based on the Industry 4.0 paradigm is becoming a key factor in enhancing the efficiency of modern food industry enterprises. For the enterprises of Kashkadarya province, the phased introduction of the following digital solutions is recommended:

Table 2.

Stages of digital technology implementation and expected outcomes[2]

Stage	Timeline	Key measures	Expected outcome
Stage I	2025–2026	ERP system, warehouse automation, electronic document management	Cost reduction by 12%
Stage II	2026–2027	IoT sensors, quality control automation, smart logistics	Product loss reduction by 18%
Stage III	2027–2028	AI-based forecasting, digital platform integration	Profitability growth by 20–25%

[2] Developed by the author

Raw material costs account for 55–65 percent of the total costs of food enterprises. For this reason, establishing long-term contractual relationships with agriculture, developing the contracting system, and forming reliable partnership relations with farming households represent a strong internal reserve for enhancing efficiency. The experience of Khorezm and Fergana provinces demonstrates that such an approach makes it possible to reduce raw material costs by 15–17 percent [11].

Organic fruits and vegetables, spices, and dairy products produced in Kashkadarya province generate high demand in international markets. However, export volumes still represent only 30–35 percent of the existing potential. The following comprehensive measures are necessary to expand exports:

– Introduction of ISO 22000, GlobalGAP, and Halal certification systems (target indicator — 50 enterprises within 3 years);

– Establishment of a unified export platform under the provincial brand;

– Opening of trade representative offices in Asian and Middle Eastern markets;

– Provision of subsidies and tax incentives to exporting enterprises.

The fundamental guarantee of sustainable efficiency is qualified personnel and continuous innovation activity. It is recommended to establish specialized personnel training for the food industry in cooperation with Karshi State University and technical higher education institutions of the province, to introduce the dual education system, and to organize research and development departments within enterprises. The experience of Germany and France demonstrates that the dual education system increases personnel qualifications by 35–40 percent and labor productivity by 22–28 percent [12].

DISCUSSION: The implementation of the proposed sustainable directions will considerably enhance the competitiveness of the food industry of Kashkadarya province. However, it must also be acknowledged that a number of organizational and financial obstacles exist in the realization of these directions.

In the process of forming the cluster system, problems may arise in balancing the interests of enterprises with different forms of ownership, creating an environment of trust, and fairly distributing costs. To address these problems, it is recommended to

incorporate an independent supervisory board into the cluster management body and to introduce a transparent financial reporting system.

To quantitatively assess the economic impact of the proposed directions, the following forecast indicators have been developed:

Table 2.

Expected socio-economic impact from the implementation of sustainable directions (2025–2028)[3]

Direction	Investment volume (bln. UZS)	Production growth (%)	New jobs (units)
Cluster formation	420	25–30	1 200
Digitalization	180	15–20	450
Raw material base	95	10–15	800
Export development	65	40–50*	300
Human capital	48	8–12	650
TOTAL	808	35–45	3 400

From the perspective of digital transformation, the limited financial capacity of small and medium enterprises must be taken into consideration. For this reason, it is advisable to develop state subsidies and preferential lending programs as a separate instrument specifically targeted at small enterprises [13].

CONCLUSION. Based on the results of the conducted research, the following scientific conclusions have been formulated:

1. To enhance the efficiency of food industry enterprises in Kashkadarya province, a unified strategic approach is required — a comprehensive model encompassing cluster development, digitalization, raw material integration, export expansion, and human capital development.

2. Following the formation of cluster structures, a reduction in production costs by 18–22 percent and an increase in production volumes by 25–30 percent within three years is assessed as a realistic possibility.

[3] Author's calculations

3. The phased implementation of digital transformation will make it possible to increase profitability by 20–25 percent by 2028.

4. The full implementation of sustainable directions may create more than 3,400 new jobs and bring the export volume of the province's food industry to 90–100 million US dollars by 2028.

5. The proposed sustainable directions must be organically integrated into the provincial socio-economic development programs and national strategy documents.

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