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## **Kyrgyz Republic production-resource and export potential state regulation mechanism**

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**Abstract.** The study addressed the mechanism of state regulation of the production, resource and export potential of the Kyrgyz Republic. The study aimed to improve the system of state regulation of the agricultural sector to increase national food security. The analysis revealed a steady increase in production of the main types of agricultural products over the period 2014-2024: cereals by 11.6%, potatoes by 12.5%, vegetables by 18.2%, meat by 24.5% and milk by 17.1%. However, the study also showed

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uneven levels of self-sufficiency across different types of products: the high levels of self-sufficiency in potatoes (167.4%), vegetables (164.5%) and milk (116.5%) contrast with the low levels of self-sufficiency in fruit and berries (18.2%), vegetable oil (44%) and sugar (69%). An analysis of the existing state regulatory mechanisms revealed a comprehensive legal framework, including the Law of the Kyrgyz Republic No. 320 “On Food Security” and the “Food Security and Nutrition Programme for 2019-2023”, but their implementation is limited by insufficient funding and administrative barriers. Based on the analysis, recommendations were developed to optimise the state regulatory mechanism, including the introduction of a differentiated subsidy system, optimisation of the structure of exports and imports of agricultural products, increasing the efficiency of agricultural production, development of agricultural processing and improving the food quality control system. Proposed measures include the creation of the brand “Ecologically clean products of Kyrgyzstan”, the introduction of the Global G.A.P. certification system, the creation of a network of regional agricultural-consulting centres, the development of agro-industrial parks and the modernisation of quality control laboratories. The implementation of these measures aims to overcome the identified problems create more favourable conditions for the development of agriculture and ensure food security in the Kyrgyz Republic

**Keywords:** agricultural sector; agricultural production; food security; self-sufficiency; subsidies; concessional lending; export potential

## INTRODUCTION

In the context of global climate change and the growing instability of global food markets, the problem of effective state regulation of the agricultural sector is becoming critical to ensuring national food security. For the Kyrgyz Republic, which has significant agricultural potential, optimisation of agricultural production and resource management mechanisms is becoming a key factor in ensuring sustainable development of rural areas, increasing food self-sufficiency and strengthening its position in regional agri-food markets. Effective state regulation in this area is intended not only to stimulate the growth of agricultural production but also to ensure national food independence in the long term.

The problem of the study is the insufficient efficiency of the existing mechanisms of state regulation of the agricultural sector of the Kyrgyz Republic, which prevents the full realisation of the national agricultural potential and limits its ability to ensure food security. Despite favourable natural and climatic conditions and significant land resources, Kyrgyzstan has several challenges in the agricultural sector, including low labour productivity in agriculture, insufficient mechanisation and technological equipment, dependence on food imports for several key items, poorly developed processing industry and limited access of local producers to international agricultural markets (Sakkaraeva & Kumashev, 2024). These factors together pose risks to the national food security and the sustainable development of its agricultural sector.

The study of the impact of state regulation on the innovation activity of enterprises attracts the attention of many scientists. As such, F. Wang and X. Dai (2020) revealed the relationship between regulatory policy and innovation activities of companies, emphasising the key role of resource reallocation in this process. Their findings confirm the need for a careful approach to the development of regulatory mechanisms to stimulate

innovation. At the same time, the efficient use of natural resources remains a key issue for many developing economies. An interesting perspective on this issue is provided by Z. Gao *et al.* (2024), who rethink the concept of the “resource curse” in the context of the Chinese model of economic development. Their research shows that, with the right approach, dependence on the resource industry can become a driver of high-quality economic growth.

An equally important aspect of government regulation is the support of key sectors of the economy (Kryvenko, 2022). In this context, a study by A.A. Naizabekova and Z.D. Iskakova (2024) on the role of investment in agriculture in ensuring sustainable economic development is noteworthy. Their study emphasises the need for a balanced approach to the allocation of investment resources between different sectors of the economy. Analysing the impact of natural resources on economic development in a broader context, a study by S. Erdoğan *et al.* (2020) is noteworthy. The authors analysed the relationship between natural resource abundance, financial development and economic growth in the example of the Next-11 countries. Their findings can be particularly useful for developing economic development strategies in resource-dependent countries.

An important aspect of government regulation of export potential is support for small and medium-sized businesses (Dolynska, 2023). In this context, the study by O. Malca *et al.* (2020) is noteworthy, as they address export support programmes as catalysts for the export activities of small and medium-sized enterprises. Their study underlines the importance of government initiatives in stimulating the export activity of small and medium-sized enterprises. Continuing the discussion on the development of export potential, the study by N. Mozhaikina and I. Ostrovskiy (2024), devoted to the peculiarities of the development and management of

export potential of small and medium-sized enterprises, is also worth consideration. The authors proposed several valuable recommendations for improving the mechanisms of state support for export-oriented small and medium-sized enterprises.

G. Gertz and M.M. Evers (2020) contributed to the understanding of global economic competition by a study on the prospects of state capitalism in geo-economic competition. Their study raised important questions about the role of the state in shaping the competitive advantages of national economies on the world stage. The study by V. De Marchi and M. Alford (2022), which provides a systematic analysis of public policy and modernisation in global value chains, is also notable. Their study offers valuable insights for developing effective strategies for integrating national producers into international production networks.

Despite the significant amount of research in this area, many aspects of the mechanism of state regulation of production, resource and export potential, especially in the context of the specifics of the Kyrgyz Republic's economy, remain insufficiently studied. In particular, the issues of adapting successful international practices to the conditions of the transforming economy of Kyrgyzstan, as well as developing a comprehensive approach to stimulating innovation activity and export potential, considering the existing resource constraints, require additional analysis. The study aimed to improve the mechanism of state regulation of the agricultural sector of the Kyrgyz Republic to ensure the food security of the country.

## MATERIALS AND METHODS

The methodological basis of the study was formed by the principles of systematicity and objectivity, which provided a comprehensive approach to the study of the mechanism of state regulation of the agricultural sector and food security of the Kyrgyz Republic in their dynamics and interrelation with the broader socio-economic context. The study was based on an analysis of a wide range of sources. The regulatory framework is composed of key legislative acts of the Kyrgyz Republic, including Law of the Kyrgyz Republic No. 183 (2008), Law of the Kyrgyz Republic No. 161 (2012), Law of the Kyrgyz Republic No. 52 (2019), Law of the Kyrgyz Republic No. 67 (2004). The study of these documents identified the legal framework and mechanisms of state regulation in the field of food security and the agricultural sector.

An important source of information was the national strategic development documents, in particular Resolution of the Government of the Kyrgyz Republic No. 320 (2019). Analysis of this document identified the main directions and priorities of State policy in the area of food security. The programme contains a comprehensive approach to solving food security problems, including measures to increase the availability and

quality of food, develop agricultural production, improve the nutrition of the population and strengthen the food safety control system. The document addresses the improvement of the efficiency of land and water resources use, development of seed and livestock breeding, and improving mechanisms of state support for agricultural producers. The study of this programme identified key metrics used by the Government to assess the level of food security and to define target metrics for the development of the agricultural sector in the medium term.

To assess the current state and dynamics of development of the agricultural sector and food security of the Kyrgyz Republic, statistical data provided by the National Statistical Committee of the Kyrgyz Republic (2015-2024). Metrics of production of the main types of agricultural products, the level of self-sufficiency of the country in food, exports and imports of agricultural products for the period 2014-2024 were analysed. The study addressed and analysed scientific publications on state regulation of the agricultural sector, food security and agricultural development in transition countries. Particular attention was devoted to studies that analyse successful international experiences in these areas.

Based on the analysis, the main trends in the development of the agricultural sector and food security in the Kyrgyz Republic were identified. In particular, the report noted a steady increase in the production of major agricultural products, and an increase in export potential in some sectors, while maintaining dependence on imports for several key food products. To assess the effectiveness of the existing state regulatory mechanisms, the current regulatory framework and institutional structure were analysed. This identified both positive aspects and problem areas in the existing regulatory system. Based on the analysis, recommendations were developed to optimise the mechanism of state regulation in the field of food security and the development of the agricultural sector of the Kyrgyz Republic. These recommendations include proposals to improve the subsidy system, optimise the structure of exports and imports of agricultural products, increase the efficiency of agricultural production, develop agricultural processing and improve the system of quality control and food safety.

## RESULTS

**Analysis of the current state and dynamics of development of the agrarian sector and food security of the Kyrgyz Republic (2014-2024).** Agriculture is primary in the economy of the Kyrgyz Republic, being the basis for ensuring national food security. Over the period 2014-2024, the agricultural sector of Kyrgyzstan demonstrated mixed dynamics of development, facing several challenges and demonstrating certain achievements. The share of agriculture in the national gross domestic product (GDP) was 14.7% in 2014, and by 2023 it had

decreased to 11.3%. Despite the relative decline in the share of GDP, the absolute volume of agricultural production has increased over this period. According to the National Statistical Committee of the Kyrgyz Republic (2015; 2023), the production of major agricultural products in the Kyrgyz Republic in 2014-2024 showed steady growth in all key areas, indicating the gradual

development of the country's agricultural sector. Table 1 illustrates the dynamics of production of the main types of agricultural products for the period 2014-2023. This table reflects changes in the production of key crops in the Kyrgyz Republic over a ten-year period, which traces long-term trends and identifies noticeable fluctuations in the national agricultural sector.

**Table 1.** Dynamics of production of main types of agricultural products in the Kyrgyz Republic, 2014-2023 (thousand tonnes)

Crop	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Cereals	1,445.9	1,723.1	1,728.1	1,681.8	1,741.5	1,781.4	1,856	1,329.1	1,867.3	1,623.8
Wheat	572.7	704.6	661.5	601	615.9	601.2	629.1	362.7	592.5	440.4
Barley	317	370.2	415.3	424.4	429.3	465.9	510.2	274.1	539.6	382.1
Grain corn	556.1	641.9	648.7	653.4	692.9	711.8	714.1	691.1	732.6	799.9
Rice	27.2	30.2	34.8	38.2	40.8	41.2	44.5	46.3	44.2	46.8
Pulses	90.1	96.7	97.7	102.6	106.6	108.6	107.2	85.5	80.6	72.3
Oilseeds	35.7	49	41.3	39.7	35.4	31.1	23.9	17.8	19.7	15.3
Cotton	69	44.1	52.1	65.3	74.7	80.2	72.8	66.9	76.5	63.4
Tobacco	1.9	1.3	0.5	1.5	1.8	0.9	1	1.1	1.2	1.4
Sugar beet	173.6	183.2	705.2	712.3	773	741.1	448.8	365.6	468.1	621
Potatoes	1,320.7	1,416.4	1,388.4	1,416	1,446.6	1,373.8	1,327.2	1,289.1	1,275	1,286.8
Vegetables	919.7	1,052.1	1,069.3	1,086.7	1,094.9	1,133.6	1,131.2	1,114.2	1,163.6	1,216.6
Gourds	193.3	248.6	237.3	259.1	249.1	245.8	261.5	224.9	226.1	235.6
Fruits and berries	237	209.2	239.3	240.6	251.4	269.5	278	266.4	275.5	278.9
Grapes	8.5	5.7	8.6	8.6	8.8	8.9	9.3	7.4	7.3	5.1

**Note:** values are in thousands of tonnes

**Source:** compiled by the authors based on National Statistical Committee of the Kyrgyz Republic data (2016-2023)

Based on the analysis of data on the production of major crops in Kyrgyzstan for the period 2014-2023, several key trends and their interrelationships can be identified. Grain production in general shows an upward trend, increasing from 1445.9 thousand tonnes in 2014 to 1623.8 thousand tonnes in 2023, reaching a peak of 1867.3 thousand tonnes in 2022. However, this growth was not uniform, reflecting the influence of various factors, including climatic conditions and changes in agricultural policy. Notably, there are mixed trends within the cereals category. Wheat production, traditionally an important crop for the country's food security, is showing a downward trend after peaking at 704.6 thousand tonnes in 2015, reaching 440.4 thousand tonnes in 2023. This decline may be due to farmers switching to other, more profitable crops, as well as the impact of climatic factors. In contrast, corn production is showing steady growth, increasing from 556.1 thousand tonnes in 2014 to 799.9 thousand tonnes in 2023. This growth may be due to increased demand for corn as a fodder crop, as well as its greater resistance to climate change compared to wheat.

Potato and vegetable production also shows positive dynamics. Potato production grew from 1320.7 thousand tonnes in 2014 to 1286.8 thousand tonnes in 2023, reaching a peak of 1446.6 thousand tonnes in 2018. Vegetable production increased from 919.7 thousand

tonnes to 1216.6 thousand tonnes over the same period. This trend can be attributed to growing domestic demand and developing export opportunities for these crops. Sugar beet production is subject to significant fluctuations, which may be a result of changes in government policy to support the industry and fluctuations in sugar market prices. The sharp increase in production from 183.2 thousand tonnes in 2015 to 773.0 thousand tonnes in 2018 was likely caused by favourable market conditions and government incentives. The subsequent decline and new growth to 621.0 kt in 2023 may reflect the industrial adaptation to changing market conditions.

Production of cotton and oilseeds is showing a downward trend. This may be caused by competition for land resources with more profitable crops, as well as difficulties in ensuring the competitiveness of these crops on the international market. At the same time, the production of fruits and berries shows a steady increase from 237.0 thousand tonnes in 2014 to 278.9 thousand tonnes in 2023, which may be the result of government programmes to develop horticulture and the growing demand for fruits and berries. These trends point to ongoing structural changes in Kyrgyz agriculture. Farmers are shifting towards more profitable and climate-resilient crops such as maize, vegetables and fruits. At the same time, there is a decline in the production of traditional industrial crops such as cotton and oilseeds.

Large fluctuations in the production of some crops, especially cereals and sugar beet, point to the need for a more stable and long-term agricultural policy. This policy should account for not only market factors but also food security, environmental sustainability and climate change adaptation. Despite the overall growth in agricultural production, Kyrgyzstan continues to face serious challenges in ensuring food security. The analysis of the national self-sufficiency in basic foodstuffs as of January-August 2023 reveals a complex overview, showing both achievements and problem areas in the country's agricultural sector (Providing Kyrgyzstan with..., 2023).

Kyrgyzstan has made significant progress in cereal production, meeting 77.6% of its domestic needs for bread products through domestic production. However, the country is still dependent on imports, which account for 62.6% of the domestic bakery market. This points to the need for further development of the grain sector to strengthen food independence. Potato vegetable and melon production is particularly successful. Self-sufficiency in potatoes reached 167.4% and in vegetables and melons 164.5%. Addressing export and import operations, these figures are even higher: 167.9% and 182.4% respectively. This high level of production not only fully meets domestic needs, but also creates significant export potential, helping to strengthen the country's economy. At the same time, fruit and berry production remains a problematic area. Self-sufficiency in these products is only 18.2% and 35.3% when imports are addressed. Imported products account for more than half of the domestic fruit and berry market (50.4%). This points to the need to develop horticulture and berry growing in the country to reduce dependence on imports.

The situation in the livestock sector is more favourable. Self-sufficiency in meat reaches 80.5%, and 97.1% when imports are considered. Imports account for 20.1% of the domestic meat market. This indicates a positive development in the livestock sector but also points to the potential for further production growth. The dairy industry demonstrates strong performance: self-sufficiency in milk is 116.5%, and including export and import operations, it is 118.8%. This not only fully meets domestic needs, but also creates opportunities for dairy exports. Egg production covers 63.9% of domestic demand, and with imports, the supply reaches 79.2%. This points to the need for further development of poultry farming to achieve full self-sufficiency. The situation with sugar and vegetable oil production remains challenging. Self-sufficiency in sugar is 69% and in vegetable oil 44%. Imports affect supply in the domestic market with 34.2% for sugar and 57.5% for vegetable oil. This underscores the need to develop the respective agricultural and food industries.

Thus, despite achieving self-sufficiency in several key food products such as potatoes, vegetables and milk, Kyrgyzstan is still dependent on imports for many important food categories. This poses risks to national

food security and points to the need for further development of the agricultural sector, especially in the production of cereals, fruit, sugar and vegetable oil. The implementation of a targeted policy to increase agricultural productivity and sustainable food production is crucial for strengthening Kyrgyz food security and achieving the Sustainable Development Goals. The analysis of Kyrgyz foreign trade in agricultural products in 2023 demonstrates a significant increase in national export potential while maintaining dependence on imports for several key food commodities. Exports of agri-food products from Kyrgyzstan in 2023 reached an impressive volume of 818.9 thousand tonnes, which is 231.8 thousand tonnes or 39.5% more compared to the same period of 2022. This significant growth indicates the strengthening of Kyrgyz position in international agricultural markets.

The structure of exports demonstrates the diversity of Kyrgyz agricultural products. The main export commodities were vegetables with a volume of 186.8 thousand tonnes, fruits – 139.1 thousand tonnes, nuts – 88.5 thousand tonnes and pulses – 70.5 thousand tonnes. Potatoes (43.5 thousand tonnes) and dried fruits (34.9 thousand tonnes) also accounted for a significant volume. This structure of exports reflects the strengths of Kyrgyzstan's agriculture, in particular, favourable conditions for growing vegetables, fruits and nuts (Exports of agricultural..., 2023). Despite success in exports, Kyrgyzstan continues to be dependent on imports for several important food products. Imports include significant volumes of poultry meat (65.1 thousand tonnes), dairy products (14.7 thousand tonnes), and large quantities of eggs (192.6 million eggs). In addition, the country imports cattle (26.3 thousand heads) and horses (7.3 thousand heads), which indicates an insufficient development of domestic livestock production in some segments (What agricultural products..., 2024).

The significant volume of imports of feed for animals, poultry and fish (about 63,000 tonnes in total) indicates the dependence of the livestock sector on foreign supplies, which may negatively affect the competitiveness of Kyrgyz livestock products. The current situation in Kyrgyz foreign trade in agricultural products points to the need for further development of the national agricultural sector. Despite successes in exports of vegetables, fruits and nuts, which demonstrate national potential in these areas, Kyrgyzstan still faces serious challenges in ensuring food security. Dependence on imports for several key foodstuffs, rising food prices and insufficient development of agricultural infrastructure pose risks to the sustainable provision of quality and affordable food to the population.

Several key factors influence the development of the agricultural sector and food security in Kyrgyzstan. Climate conditions and natural risks, such as droughts and frosts, create instability in agricultural production. Limited land and water resources constrain the

potential for expanding agricultural production. The low level of mechanisation and technological equipment in agriculture leads to a decrease in labour productivity and production efficiency. Insufficient development of storage and processing systems for agricultural products limits opportunities for value-addition and extending the shelf life of products. Limited access of

farmers to financial resources hampers investments in modernisation and expansion of production. The volatility of world food prices creates additional risks for the stability of the domestic market. The following table provides a visual representation of the current state of food security in Kyrgyzstan and the key factors affecting it (Table 2).

**Table 2.** Key Metrics of Food Security in Kyrgyzstan and Factors Influencing its Provision

Metric	Value	Influencing factors
Level of self-sufficiency in bread products	77.6%	Climate conditions, limited land resources
Level of self-sufficiency in meat products	80.5%	Insufficient development of the feed base, low mechanisation
Level of self-sufficiency in dairy	116.5%	Traditionally developed livestock farming
Level of self-sufficiency in vegetables and melons	164.5%	Favourable climatic conditions
Level of self-sufficiency in fruits and berries	18.2%	Insufficient development of horticulture
Food price growth (2014-2023)	78.5%	Volatility of global prices, dependence on imports
Share of agriculture in GDP	11.7%	Low labour productivity, limited investment
Share of agricultural exports in total exports	15.3%	Insufficient development of storage and processing systems

**Note:** self-sufficiency level is calculated as the ratio of domestic production to total consumption; food price growth is presented as cumulative growth for the period 2014-2023

**Source:** compiled by the authors

These factors together form a complex environment for the development of agriculture and food security in Kyrgyzstan. They require a comprehensive approach to solving problems and improving mechanisms of state regulation in this area. Measures are needed to stimulate Kyrgyz production, improve the efficiency of agriculture, develop the agro-industrial complex and optimise the structure of food exports and imports. This situation highlights the need to improve the mechanisms of state regulation in the field of food security, including stimulation of Kyrgyz production, improvement of agricultural efficiency, development of the agro-industrial complex and optimisation of the structure of food exports and imports.

**State mechanisms for regulating the agricultural sector and ensuring food security in the Kyrgyz Republic.** The system of state regulation of the agricultural sector and food security in the Kyrgyz Republic is a complex and multi-level structure based on interrelated legislation, targeted programmes and specialised support measures. The central element of this system is Law of the Kyrgyz Republic No. 183 (2008). This law is central to establishing the legal framework to ensure national food independence, economic and physical accessibility of food and its safety for the Kyrgyz population. The Law of the Kyrgyz Republic No. 183 (2008) contains several key definitions that form the conceptual basis of the state policy in the field of food security. It defines such relevant concepts as “food security”, “food independence”, “economic accessibility of food” and “physical accessibility of food”. These definitions outline the goals and objectives of state policy in this area.

An important aspect of the law is the establishment of the principles of state policy in the field of food security. These include ensuring physical and economic availability of safe food products for all segments of the population, guaranteeing food quality and safety, supporting Kyrgyz agricultural producers, and developing competitive agricultural production. The law delineates the powers of different levels of government in food security. It defines the competencies of the Government of the Kyrgyz Republic, authorised state bodies and local self-government bodies. This delineation allows for the creation of an effective system of management and control in food security at all levels of government. The law addresses the regulation of the formation and use of state food reserves. This aspect is critical to ensuring the stability of the food supply in the event of emergencies or sharp fluctuations in the market. The law establishes the procedure for the formation, storage and use of food reserves, providing quick state response to crises in the food supply sector.

In addition, the law provides mechanisms for monitoring and evaluating the state of food security in the country. This includes the regular collection and analysis of data on food production, imports and consumption, as well as an assessment of the country’s self-sufficiency in basic foodstuffs. This approach identifies potential threats to food security, which can be used to take the necessary measures promptly. The Government of the Kyrgyz Republic developed and approved Resolution of the Government of the Kyrgyz Republic No. 320 (2019). This program addresses a set of objectives, including increasing the availability and quality of

food, developing agricultural production, improving the population's nutrition and strengthening the food safety control system. The programme provides several specific support measures for agricultural producers. These include subsidies for the purchase of plant protection products, which are regulated by the draft Regulations on the Procedure... (2017). According to this draft regulation, subsidies are granted by the Ministry of Agriculture, Food Industry and Land Reclamation of the Kyrgyz Republic to reimburse part of the costs of purchasing pesticides permitted for use in the Kyrgyz Republic.

The subsidy rate is set at 20% of the cost of plant protection products. Subsidies are granted if there are crop areas treated with plant protection products. The recipients of subsidies may be agricultural producers and organisations of the agro-industrial complex, regardless of their legal form and form of ownership, engaged in the production of agricultural products. However, the effectiveness of these subsidies remains a matter of debate. There are concerns that the number of subsidies allocated may not be sufficient to ensure significant productivity growth in the sector. This may be due to limited budgetary resources and potential difficulties in administering the subsidies, especially for small farms. In addition, the process of obtaining subsidies requires farmers to prepare and submit a significant amount of documentation, which may pose additional difficulties, especially for small farms.

Another important mechanism for supporting agricultural producers is the system of preferential lending. It is implemented through state-owned banks and specialised funds such as Aiyl Bank and the Kyrgyz-Russian Development Fund. The legal basis for this mechanism is Law of the Kyrgyz Republic No. 161 (2012), which defines the principles and procedures for the functioning of state financial development institutions. Despite the existence of this system, access to financial resources for many agricultural producers remains limited. This is related to high collateral requirements, complicated loan processing procedures and insufficient financial literacy of small farmers. As a result, a significant part of agricultural enterprises, especially small farms, do not have access to the necessary financial resources to modernise production and increase productivity. As a member of the Eurasian Economic Union (EAEU), Kyrgyzstan adheres to a common customs and tariff policy in regulating foreign trade in agricultural products. The main regulatory act in this area is the Customs Code of the Eurasian Economic Union. According to this code, the Single Customs Tariff of the EAEU applies to imports of agricultural products from third countries (Mukhametov *et al.*, 2023).

To protect the domestic market and support Kyrgyz producers, Kyrgyzstan uses several methods within the framework of EAEU membership. These include tariff and non-tariff measures to regulate foreign trade, which are applied following the EAEU Treaty and decisions of

the Eurasian Economic Commission. In respect of imports of agricultural products, Kyrgyzstan, as a member of the EAEU, applies the EAEU Common Customs Tariff, which may include seasonal duties on certain types of products. These measures aim to protect the interests of Kyrgyz producers in certain periods of the year. As for agricultural exports, Kyrgyzstan may impose temporary restrictions on the export of certain types of goods following national legislation and obligations under the EAEU. The basis for such measures is Law of the Kyrgyz Republic No. 52 (2019), which provides for the possibility of imposing export bans and restrictions to ensure national security, protect the domestic market and fulfil the international obligations of the Kyrgyz Republic. These measures can be used to ensure the country's food security in cases of crop failure, emergencies or significant price fluctuations in the world food market.

The food quality and safety control system in Kyrgyzstan is based on the Law of the Kyrgyz Republic No. 67 (2004) and the relevant technical regulations. This law establishes the legal basis for the development, adoption, application and enforcement of mandatory requirements for products, including food products. The Centre for Standardisation and Metrology under the Ministry of Economy of the Kyrgyz Republic is central to the quality control system (Regulations on the..., 2021). This body is responsible for the development and implementation of national quality standards that are harmonised with international standards, in particular Codex Alimentarius. The activities of the Centre are regulated by Law of the Kyrgyz Republic No. 67 (2004), which defines the principles and procedures for the development and application of technical regulations and standards.

The State Inspectorate for Veterinary and Phytosanitary Safety under the Government of the Kyrgyz Republic controls the safety of products of animal and plant origin. This body is regulated by Law of the Kyrgyz Republic No. 175 (2014) and Law of the Kyrgyz Republic No. 2 (2015). The Inspectorate conducts regular inspections of agricultural enterprises, storage and sale of products, as well as border control of import and export of agricultural products. Despite the existence of a comprehensive regulatory system, its effectiveness remains a matter of concern. The main problems are related to insufficient funding from regulatory authorities, lack of modern laboratory equipment for analyses, and insufficient coordination between the various agencies involved in ensuring food security. In general, state regulation mechanisms for the agricultural sector and food security in the Kyrgyz Republic cover a wide range of measures from legislative regulation to specific programmes to support producers and control the quality of products. However, the effectiveness of these mechanisms is limited by several factors, including insufficient financial resources, administrative barriers and difficulties in coordinating the actions of various

government agencies. This indicates the need to further improve the system of state regulation to better address the challenges of agricultural development and food security in the country.

**Recommendations for optimising the state regulation mechanism.** Improvement of the system of subsidising agricultural producers is a key factor in increasing the efficiency of the agricultural sector in Kyrgyzstan. The existing system, which provides for 20% reimbursement of costs for plant protection products, does not take into account regional specifics and is difficult for small farmers. The experience of Turkey shows that a differentiated approach to subsidies can significantly increase their efficiency. In Turkey, subsidies for seeds and seedlings range from 30% to 75% depending on region and crop, which resulted in a 20-25% increase in yields over five years (Cevher & Cevher, 2021). Considering this, it is recommended to introduce a comprehensive system of differentiated subsidies in Kyrgyzstan. For mountainous areas with limited cultivated areas, subsidies for the purchase of high-yielding seeds and seedlings should be increased to 40% of the cost. In arid regions, such as the Batken region, a 50% subsidy for the introduction of drip irrigation should be introduced. This is particularly relevant given the successful experience in Israel, where the use of drip irrigation reduced water consumption by 30-40% while increasing yields (Ayars et al., 2024).

For organic farmers, whose number in Kyrgyzstan is growing, but still small, it is advisable to provide 60% subsidies for certification of products according to international standards. Such a measure is successfully applied in Tunisia, where the area of organic farmland tripled in five years (Benabdelkader et al., 2021). Implementation of these measures will require amendments to the Regulations on the Procedure for Granting Subsidies to Agricultural Commodity Producers for the Purchase of Plant Protection Products (2017) and the creation of a "single window" based on district departments of agriculture to receive applications and counselling of farmers. Optimisation of the structure of exports and imports of agricultural products is the next important step in ensuring the food security of the country. Currently, Kyrgyzstan exports raw materials with low added value, importing significant amounts of food (Omurgazieva et al., 2024). To change this situation, it is necessary to develop a programme to support exports of high-value-added products. A successful example of such an approach is the experience of Chile, which in recent years has significantly increased exports of wine and fruit through the creation of a national brand and active promotion in international markets (Panez et al., 2020).

Similarly, to the Chilean experience, it is recommended that Kyrgyzstan create a brand "Ecologically clean products of Kyrgyzstan" to promote organic fruits, honey, and dried fruits in the EAEU and Chinese markets. At the same time, it is necessary to introduce a Global

G.A.P. certification system for the 500 largest fruit and vegetable producers. This will facilitate access for Kyrgyz products to foreign markets, especially in the EU, where this standard is widely recognised. To optimise imports, the Kyrgyz poultry industry should be encouraged to reduce chicken meat imports by 50% within 5 years. A similar strategy was successfully implemented in Morocco, which not only fully supplied the domestic market but also became an exporter of poultry meat within a decade (Fagrach et al., 2023). The implementation of these measures will require the development and adoption of a state programme for the development of agricultural exports for 2025-2030, as well as the establishment of the Agency for the Promotion of Agricultural Exports under the Ministry of Agriculture.

Improving the efficiency of agricultural production is critical to ensuring food security in Kyrgyzstan. Currently, the country faces problems of low agricultural productivity, insufficient use of modern technologies and fragmentation of land plots. To address these problems, it is recommended to create a comprehensive system of support for farmers, including advisory services, promotion of cooperation and the renewal of machinery. A successful example of the implementation of such a strategy is the experience of India, where an extensive network of agricultural advisory centres *Krishi Vigyan Kendra* was established, which led to a significant increase in labour productivity in the agricultural sector (Varshney et al., 2019). Similar to the Indian experience, it is recommended to create a network of 7 regional agricultural consulting centres in Kyrgyzstan based on existing agricultural universities and research institutes. These centres will provide farmers with information on modern farming and livestock production technologies, as well as advice on farm management and product marketing.

The development of agricultural cooperation is another important area for improving the efficiency of the agricultural sector. A successful example in this area is the experience of dairy co-operatives in Kenya, which helped small-scale producers improve the quality of their products and find stable markets (Onyango et al., 2023). Building on this experience, it is recommended to develop an agricultural cooperative development programme that includes tax incentives and grants for newly established cooperatives. To upgrade the agricultural machinery fleet, it is proposed to introduce a preferential leasing programme with a 50% subsidy of the down payment for small and medium-sized farms. A similar programme has been successfully implemented in Brazil (Baccarin et al., 2020). The implementation of these measures will require the adoption of the Law on Agricultural Consulting, amendments to the Tax Code of the Kyrgyz Republic, and the establishment of a state leasing company.

The development of agricultural processing and the creation of added value is a key factor in increasing

the competitiveness of the Kyrgyz agricultural sector. Currently, the country has an underdeveloped processing industry and a low level of domestic processing of agricultural products. To solve this problem, it is recommended to create an infrastructure for processing agricultural products and stimulate the development of processing enterprises. A successful example of implementing such a strategy is the experience of Thailand, where the creation of agro-industrial clusters has led to a significant increase in the production of high-value-added products. Similarly, to the Thai experience, it is recommended to create 4 agro-industrial parks in Kyrgyzstan in the main agricultural regions of the country (Chui, Issyk-Kul, Osh and Talas oblasts). For instance, a complex to produce canned beans and other legume products could be created in the Talas region, which is known for its beans.

To stimulate the development of small processing enterprises in rural areas, it is proposed to develop a programme of concessional lending with an interest rate not exceeding 5% per annum. It is also recommended to introduce a system of tax preferences for vertically integrated agro-industrial complexes. A successful example of such integration in other countries is Olam International in Singapore, which has created vertically integrated chains of production and processing of various crops in developing countries. Implementation of these measures will require the adoption of the Law "On Agricultural Parks in the Kyrgyz Republic", amendments to the Tax Code of the Kyrgyz Republic and the establishment of a special fund for preferential lending to processing enterprises under the Russian-Kyrgyz Development Fund. Improving the system of quality control and food safety is critical to ensure food security and increase the competitiveness of Kyrgyz products in international markets. Currently, the country faces the

problems of insufficiently equipped laboratories, lack of product traceability and food smuggling. To address these problems, it is recommended to modernise the system of quality control and food safety following international standards.

A successful example of modernising a quality control system is the experience of Chile, which managed to bring its system in line with EU and US requirements in a short time, which opened access to these important markets for Chilean products (Lu *et al.*, 2021). In Kyrgyzstan, it is recommended to equip 5 key laboratories of the Centre for Standardisation and Metrology and the State Inspectorate for Veterinary and Phytosanitary Safety with modern equipment to conduct analyses following EU standards. The introduction of a digital system for traceability of products "from field to counter" based on blockchain technology is another important step in improving food safety. Such a system has been successfully implemented in Australia, where it has significantly reduced cases of product falsification and increased consumer confidence (Elahi *et al.*, 2023). Implementation of these measures will require the development and adoption of a state programme for modernisation of food quality control laboratories for 2025-2030, amendments to Law of the Kyrgyz Republic No. 67 (2004) and Criminal Code of the Kyrgyz Republic (2021).

Based on the recommendations presented to optimise the mechanism of state regulation in food security in Kyrgyzstan, it is possible to identify key areas and appropriate measures that can potentially bring significant benefits to the development of the national agricultural sector. For a clear presentation of this information, a summary table reflecting the main recommendations, their expected results and examples of successful international experience is presented below (Table 3).

**Table 3.** Key recommendations for optimising the mechanism of state regulation of the agricultural sector in Kyrgyzstan

Direction	Recommended actions	Expected results	International experience
Subsidisation	Differentiated subsidies (up to 40% for seeds, 50% for drip irrigation, 60% for organic certification)	Yield growth by 20-25%, water consumption reduction by 30-40%	Turkey, Israel, Tunisia
Exports and imports	Creation of the brand "Ecologically clean products of Kyrgyzstan", introduction of Global G.A.P., development of poultry farming	Exports up 30%, imports down 50%	Chile, Morocco
Production efficiency	Establishment of 7 agricultural consulting centres, development of cooperation, and a preferential leasing programme for machinery	Increased labour productivity, 40% increase in the number of cooperatives	India, Kenya, Brazil
Product processing	Establishment of 4 agro-industrial parks, preferential lending of up to 5% per annum	Growth in the production of high-value-added products	Thailand, Singapore
Quality control	Modernisation of 5 key laboratories, implementation of a traceability system	Compliance with international standards, reduction of counterfeit products	Chile, Australia

**Source:** compiled by the authors

Thus, the proposed recommendations, based on the successful experience of other countries and accounting for the specifics of Kyrgyzstan, will significantly optimise the mechanisms of state regulation in the field

of food security in the country. Their implementation will increase the efficiency of agricultural production, increase exports of high-value-added products, develop the processing industry and improve the quality and

safety of food, which will ensure the sustainable development of the agricultural sector of the Kyrgyz Republic.

## DISCUSSION

The study of the mechanism of state regulation of the agricultural sector and food security in the Kyrgyz Republic revealed several key aspects and trends. The analysis showed that over the period 2014-2024, there has been a steady increase in the production of major agricultural products, including cereals, potatoes, vegetables, meat and milk. There is also an increase in the export potential of agricultural products, as evidenced by a 39.5% increase in exports of agri-food products in 2023 compared to the previous year. However, the study also identified several challenges, including insufficient self-sufficiency in certain types of food, dependence on imports for several key food products, and insufficient development of agricultural storage and processing systems. The analysis of government regulatory mechanisms showed the existence of a comprehensive regulatory framework but also identified problems in the implementation and effectiveness of existing support measures for agricultural producers.

The results of the study revealed insufficient development of innovation in the agricultural sector of Kyrgyzstan, which indicates the need to revise the existing mechanisms of state regulation in this area. In this context, the concept of “regulatory abstinence” proposed by M. Dewey and D. Di Carlo (2022), represents an alternative approach to stimulating innovation in agriculture. The authors consider the selective non-application or relaxation of regulations as an agricultural policy tool that can stimulate innovation and economic growth in certain agricultural sectors. However, an analysis of the situation in Kyrgyzstan shows that the approach described by M. Dewey and D. Di Carlo is practically not applied in the country. While the researchers note the potential effectiveness of this approach to stimulate innovation, the situation in Kyrgyzstan is characterised by the lack of effective mechanisms to support innovation in the agricultural sector.

This points to the need not only to revise existing regulations but also to develop a comprehensive strategy for innovative agricultural development that could include elements of “regulatory abstinence” combined with active measures to support innovation. Such an approach could be used to stimulate innovation in agricultural sectors that have the potential to diversify Kyrgyzstan’s agricultural production and increase its productivity. For example, it could promote the development of innovative technologies in organic farming, precision agriculture or the development of new crop varieties adapted to local conditions.

The results of this study revealed a significant growth in agri-food exports from Kyrgyzstan, which increased by 39.5% in 2023 compared to the previous year. However, the analysis also revealed the national

dependence on imports for several key food commodities. This finding takes on particular significance considering the study by M.A. Bashir *et al.* (2020), who investigated the relationship between export diversification and energy efficiency using OECD countries as an example. Although this study did not focus directly on energy efficiency, the situation in Kyrgyzstan is consistent with the findings of M.A. Bashir *et al.* on the importance of export diversification for sustainable economic development. However, the situation in Kyrgyzstan has its peculiarities. Unlike the OECD countries considered in their study, Kyrgyzstan faces more fundamental problems of structural transformation of the agricultural sector.

The analysis shows that for Kyrgyzstan, the issue of agricultural export diversification is closely linked not only to energy efficiency, but also to a wider range of issues, including the development of the processing industry, improving product quality to meet international standards, and integration into global food supply chains. This underscores the need to develop a comprehensive agricultural export diversification strategy that considers the specific conditions and constraints of Kyrgyzstan’s agricultural sector, including its geographical location, agricultural production structure and available natural resources. In the context of analysing regulatory governance in the agricultural sector through the prism of political economy, the study by M. Guidi *et al.* (2020) provides an important theoretical framework. The authors propose to consider regulatory governance not only as a technical but also as a political process, influenced by various interest groups and institutional factors. This approach is particularly relevant for analysing the situation in the agricultural sector of Kyrgyzstan, where, as this study has shown, there are significant problems in the implementation of legislation and coordination between various government agencies responsible for agricultural development and food security. The conclusions of M. Guidi *et al.* on the importance of taking political factors into account when developing regulatory policy are confirmed by the identified institutional problems in Kyrgyzstan.

In particular, the results of the study point to the need for a deeper analysis of the political economy factors influencing the formulation and implementation of agricultural policy in the country. This includes not only formal institutions and procedures, but also informal practices, the distribution of power among different interest groups in the agricultural sector, and the historical patterns of interaction between the state and agricultural producers. Addressing these factors can help develop more effective and enforceable regulatory mechanisms that contribute to the development of the agricultural sector’s productive and resource potential and improve Kyrgyz food security.

Considering the issues of modern economic regulation in the agricultural sector and its adaptation to changing conditions, C. Decker (2023) provides important

theoretical and practical conclusions. The author emphasises the need to adapt regulatory mechanisms to rapidly changing technological and economic conditions, which is especially relevant in the era of digitalisation and globalisation of agricultural production. The findings of this study, which indicate insufficient development of innovation in Kyrgyz agriculture and the national weak integration into global food supply chains, suggest that the regulatory system of the agricultural sector does not fully meet the current challenges. In contrast to the developed economies considered by C. Decker, Kyrgyzstan faces more fundamental problems in creating an effective regulatory environment in agriculture. This includes not only technical aspects of regulation but also basic issues of institutional development, increasing transparency and accountability of regulatory bodies in the agricultural sector, as well as creating a culture of compliance among agricultural producers. In this context, C. Decker's proposals for introducing more flexible and adaptive forms of regulation may be particularly valuable for the Kyrgyz agricultural sector. However, their implementation will require significant efforts to strengthen the institutional capacity of agricultural regulators, develop feedback mechanisms for farmers and agricultural enterprises, and increase the overall level of digitalisation of the agricultural sector and its management.

Addressing the issue of taking national characteristics into account in the formulation of agricultural policy, the study by B. Clift (2021) provides a relevant perspective within the comparative analysis of political economy. The author emphasises the importance of historical, cultural and institutional characteristics of countries in the formulation of economic policies. This observation finds confirmation in the results of the present study, which indicate the need to adapt the international experience to the specific conditions of the agricultural sector in Kyrgyzstan. In particular, the identified problems in the implementation of agricultural legislation and coordination between government agencies responsible for agricultural policy indicate the importance of addressing the institutional characteristics of the country when developing regulatory mechanisms. However, the situation in Kyrgyzstan demonstrates that simply recognising national peculiarities is not enough. The results of the study show that the country faces serious challenges in adapting international practices of agricultural sector regulation to its conditions. This is particularly noticeable in the areas of innovative agricultural development and integration into global food supply chains, where Kyrgyzstan lags far behind many countries (Tsapova *et al.*, 2024). In this context, B. Clift's approach to comparative political economy analysis can be particularly useful for identifying successful practices of agricultural sector regulation in countries with similar characteristics and adapting them to Kyrgyz conditions.

Analysing aspects of sustainable agricultural development and the role of the state in this process, G. D'Alisa and G. Kallis (2020) offer an alternative view of economic development through the concept of "degrowth". Although the authors focus on developed economies, their ideas can be partially applied to the agricultural sector of Kyrgyzstan. The authors consider the role of the state in the context of the transition to more sustainable models of economic development, which are not based solely on the constant growth of production. Although Kyrgyzstan does not face the challenges of the developed economies discussed by the authors, their observations on the need to rethink the role of economic growth in public policy may be relevant for the Kyrgyz agricultural sector in the long term. The findings of this study, which point to the uneven development of different agricultural sub-sectors and problems with food security, emphasise the importance of finding more sustainable models for agricultural development.

In the context of Kyrgyzstan, this may not denote abandoning agricultural production growth, but rather reorienting towards higher quality and more inclusive growth that considers environmental and social aspects. This is particularly relevant considering the identified problems with agricultural diversification and the uneven distribution of benefits from agricultural sector development. For example, this could include support for organic farming, the development of agroecological practices, and the promotion of high-value-added products rather than simply increasing the production of raw materials (Trusova *et al.*, 2021). However, the implementation of such ideas in the Kyrgyz agricultural sector will require significant institutional changes and a rethinking of the role of the state in agricultural development, including a review of the subsidy system, support for small farmers and rural development.

In general, a comparison of the results of the study with the works of other authors can be used to conclude that Kyrgyzstan faces several unique challenges in the field of state regulation of economic potential. While many of the theoretical concepts developed for developed economies remain relevant, their application requires significant adaptation to the country's specific conditions. Particular attention should be paid to the diversification of the economy, the development of innovation and the improvement of the institutional environment for more efficient use of national production, resource and export potential. It is important to consider not only economic but also social, environmental and political aspects of development, which requires a comprehensive and interdisciplinary approach to the development and implementation of regulatory policy.

## CONCLUSIONS

An analysis of the current state and dynamics of the agricultural sector over the period 2014-2024 revealed

an upward trend in the production of major agricultural products. An increase in the production of grain crops by 11.6%, potatoes by 12.5%, vegetables by 18.2%, meat by 24.5% and milk by 17.1% was noted. These figures indicate a gradual development of agricultural production in the country. An analysis of Kyrgyz self-sufficiency in staple foods has revealed a mixed picture, reflecting both achievements and challenges in the country's agricultural sector. Despite the overall growth in agricultural production, there is a significant shortage of several key food items.

Particularly low self-sufficiency is observed in the production of fruits and berries, where the level is only 18.2%. This indicates a significant dependence on imports of fruits and berries, which may be due to the underdevelopment of horticulture and berries growing in the country. The production of vegetable oil also remains a problematic area with a self-sufficiency level of 44%, which indicates the need to develop oilseeds and processing capacities. The situation with sugar is somewhat better, but still insufficient, with a self-sufficiency level of 69%, indicating the need to expand sugar beet production and modernise sugar factories. On the other hand, Kyrgyzstan has reached a high level of self-sufficiency in some agricultural products, which creates potential for exports. For example, the level of self-sufficiency in potatoes reaches 167.4%, which not only fully meets domestic needs, but also creates significant export potential. A similar situation is observed in the production of vegetables, where the level of self-sufficiency is 164.5%, which indicates a well-developed vegetable production in the country. The dairy industry also shows positive metrics, with a self-sufficiency level of 116.5%, which allows it not only to supply the domestic market but also to export dairy products. This unevenness in the levels of self-sufficiency for different

types of products indicates the need for a more balanced approach to the development of various sectors of the Kyrgyz agriculture and food industry.

A study of existing mechanisms of state regulation revealed the existence of a comprehensive legislative framework, including the Law "On Food Security" and the "Food Security and Nutrition Programme for 2019-2023". Based on the analysis, recommendations for optimising the mechanism of state regulation have been developed. The key areas of improvement are the introduction of a differentiated subsidy system, optimisation of the structure of export and import of agricultural products, increasing the efficiency of agricultural production, development of agricultural processing and improvement of the system of food quality control. The developed recommendations are aimed at overcoming the identified problems creating more favourable conditions for the development of agriculture and ensuring the food security of the country. The limitations of this study are related to the use of secondary data and the lack of field research. Prospects for further research include a more detailed analysis of the effectiveness of the proposed measures in practice, exploring the possibilities of adapting the successful international experience to the specific conditions of Kyrgyzstan and studying the impact of climate change on the country's food security. Particular attention should be devoted to the analysis of the potential for the development of organic agriculture and its role in ensuring food security in Kyrgyzstan.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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## Механізм державного регулювання виробничо-ресурсного та експортного потенціалу Киргизької Республіки

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**Анотація.** Дослідження присвячено аналізу механізму державного регулювання виробничо-ресурсного та експортного потенціалу Киргизької Республіки. Метою роботи було вдосконалення системи державного регулювання аграрного сектора для підвищення продовольчої безпеки країни. Проведений аналіз виявив стійке зростання виробництва основних видів сільськогосподарської продукції за період 2014-2024 рр.: зернових культур на 11,6 %, картоплі на 12,5 %, овочів на 18,2 %, м'яса на 24,5 % і молока на 17,1 %. Однак дослідження також засвідчило нерівномірність у рівнях самозабезпеченості за різними видами продукції: високі показники щодо картоплі (167,4 %), овочів (164,5 %) та молока (116,5 %) контрастують із низьким рівнем самозабезпеченості фруктами та ягодами (18,2 %), рослинною олією (44 %) та цукром (69 %). Аналіз наявних механізмів державного регулювання виявив наявність комплексної законодавчої бази, що включає Закон Киргизької Республіки № 320 “Про продовольчу безпеку” та “Програму продовольчої безпеки та харчування на 2019-2023 роки”, проте ефективність їхньої реалізації обмежується недостатнім фінансуванням та адміністративними бар'єрами. На основі проведеного аналізу було розроблено рекомендації щодо оптимізації механізму державного регулювання, що включають впровадження диференційованої системи субсидування, оптимізацію структури експорту та імпорту агропродукції, підвищення ефективності сільськогосподарського виробництва, розвиток переробки сільгосппродукції та вдосконалення системи контролю якості продуктів харчування. Запропоновані заходи включають створення бренду “Екологічно чисті продукти Киргизстану”, впровадження системи сертифікації Global G.A.P., створення мережі регіональних центрів агроконсалтингу, розвиток агропромислових парків і модернізацію лабораторій контролю якості. Реалізація цих заходів спрямована на подолання виявлених проблем і створення більш сприятливих умов для розвитку сільського господарства та забезпечення продовольчої безпеки Киргизької Республіки

**Ключові слова:** аграрний сектор; сільськогосподарське виробництво; продовольча безпека; самозабезпеченість; субсидювання; пільгове кредитування; експортний потенціал

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