Eurasian Development Bank

Food Security and Agro-Industrial Potential of the Eurasian Region

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FACTS AND FIGURES

FOOD SECURITY AND AGRO-INDUSTRIAL POTENTIAL OF THE EURASIAN REGION

AGRICULTURE — KEY ELEMENT OF THE LONG-TERM ECONOMIC SPECIALISATION OF THE EURASIAN REGION

A potential for intensive and extensive development that is unique in the world:

10% of the world's **agricultural land** is located in the region with only **3% of the world's population,** with prospects to expand

33% share of **rural population** in the region

1.5–2x potential **yield** growth

130 million **labour force**

FOOD SECURITY IS DETERIORATING WORLDWIDE

- Humanity is falling short of the UN goals to end hunger: the number of people suffering from hunger and malnutrition on our planet is **828 million** in 2022
- We forecast a prolonged period of **high food prices**

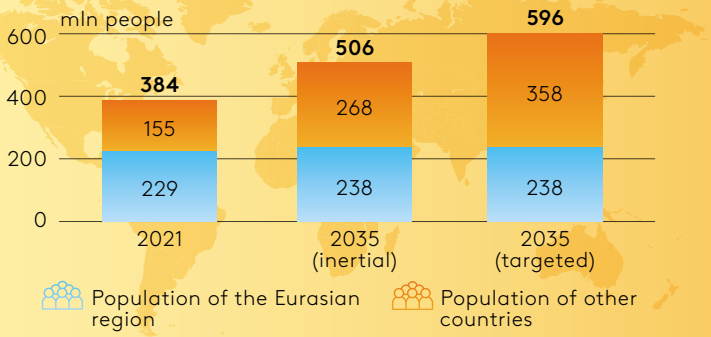
SELF-SUFFICIENCY RATE FOR MOST FOOD PRODUCTS IN THE EURASIAN REGION IS 80–95%

- However, there are still **significant differences** among countries within the region in both food production and food consumption
- The **application of a broader concept of food security** assures its achievement in the most effective way through **smooth operation of export and import channels**

EURASIAN REGION WILL BE ABLE TO FEED 600 MILLION PEOPLE BY 2035

42% increase in **food production** by 2035, with an average annual growth rate of **1.5–2.5%**

USD 34 billion increase in **exports** by 2035 (USD 40 billion in 2021). The largest contribution is from: oilseeds and cereal crops, meat and dairy products, vegetables and fruit



MUTUAL TRADE IS THE KEY TO FOOD SECURITY

- Over the past 20 years, the volume of mutual trade of agro-industrial products among the EAEU countries, Tajikistan, and Uzbekistan has increased **by a factor of 8.5 and reached USD 15.4 billion in 2021**
- By 2035, the volumes of mutual trade in food will increase by an additional 1.8 times to **USD 27.1 billion** (an increase of USD12 billion). The expansion of mutual trade will contribute to ensuring **economic and physical availability** of food in the Eurasian region

REALIZING THE POTENTIAL OF THE AGRO-INDUSTRIAL COMPLEX

- Development of **agrologistics and storage systems** (formation of the Eurasian Commodity Distribution Network), transportation logistics in the eastern and southern directions (International North-South Transport Corridor), port infrastructure, etc.
- **Accelerated development of the science and technology base** of the agricultural sector (genetics and selective breeding, seed production and pedigree livestock breeding, water saving technologies, etc.), and **digitalization in agriculture**
- **Import substitution in mechanical engineering** (rolling stock, merchant fleet, agricultural machinery and equipment)
- Support of **large producers** (including incentives for the cooperation among small farms) at the national level and the level of the EAEU
- **Lifting barriers and restrictions** between the countries of the Eurasian region
- Effective **regulation** and coordinated investment policy within the Central Asian water and energy complex
- Strengthening **the financial infrastructure** to support the activities of the agro-industrial sector

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Vinokurov, E. (ed.), Ahunbaev, A., Chuyev, S., Usmanov, N., Zaboev, A., Malakhov, A., Pereboev, V., Ksenofontov, M., Polzikov, D., Potapenko, V., Shalimov, V. (2023) *Food Security and Agro-Industrial Potential of the Eurasian Region*. Reports and Working Papers 23/1. Almaty: Eurasian Development Bank.

Based on the balance approach, the report analyses the production, resource, and export potential of the agro-industrial complexes of the EAEU countries, Tajikistan, and Uzbekistan for the period until 2035. The resource potential for extensive and intensive growth of production of key agri-food products is estimated for two scenarios, taking into account the prospects of agricultural lands expansion and improving yields and productivity. Consumer demand models are used for scenario-based estimation of potential domestic consumption of agro-industrial products, including for food and other purposes. Export potential estimates are based on the logic of the balance approach. In addition, the paper identifies potential markets for food products; offers estimates of the macroeconomic effects of the realisation of the resource, production, and export potential of the agro-industrial complex made by applying multipliers, calculated based on input-output tables; examines the factors hindering development of the agro-industrial complex; offers ways to tap the potential; and defines the principle aspects of food policy in the region.

Keywords: food security, Eurasian region, Central Asia, Eurasian Economic Union, food exports, mutual trade, export potential.

JEL: F15, F17, F52, L66, Q11, Q18

The electronic version of this document is available at the Eurasian Development Bank website: https://eabr.org/en/analytics/special-reports/.

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SUMMARY

Agriculture and the agro-industrial complex are key elements of the long-term economic specialisation of the Eurasian region[1]**.** The region has one of the most significant production, resource, and export potentials in the world due to the following factors:

- **Specialisation in agriculture.** Historically, agriculture has been one of the basic elements of the economic specialisation of the Eurasian countries. The region has a culturally and historically shaped and well-established ecosystem of production factors, socio-economic links, and other basic elements vital for the functioning of the agro-industrial complex.

- **The region has 480 million hectares of agricultural land,** or **10.1%** of the world's agricultural land, while the population comprises about **3%** of the world's population. At the same time, the region is characterised by a low rate of utilisation of arable land; it is possible to reintegrate the land previously withdrawn from the economic cycle — a drop from 165 million ha to 115 million ha over 1990–2021.

- **Potential yield growth by a factor of 1.5–2.** The yields of most crops in the Eurasian countries fall short of those in developed countries, among other things due to less fertilizer application and insufficient agricultural machinery.

- **Significant labour resources — more than 130 million** able-bodied people, making up **33.1%** of the rural population.

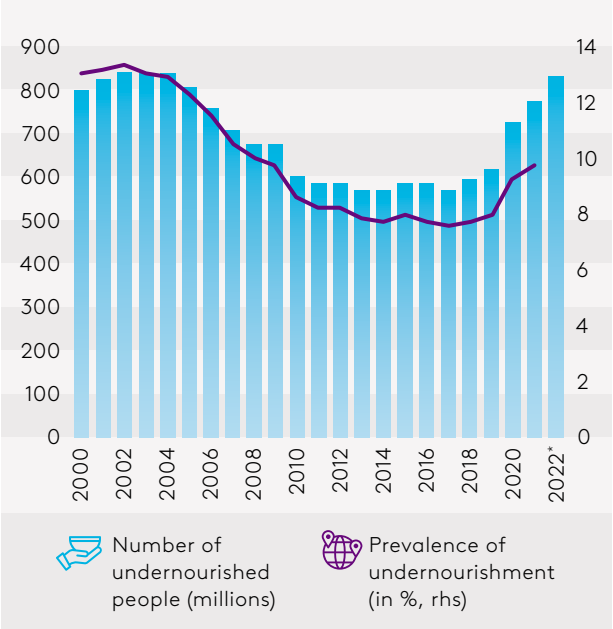
- **Proximity of lucrative sales markets** — the largest food consumers, with a total population of more than **3 billion**, primarily China, India, countries in Africa and the Middle East. In the medium term, it is estimated that China will account for **41% and 34%** of the additional global demand for fish and meat, respectively, and **about 50%** of the additional global demand for fresh dairy products is expected to come from India.

The food security situation is deteriorating worldwide, with **one out of every nine people on Earth going hungry or undernourished.** Hunger remains one of humanity's main challenges, while the world is moving farther away rather than closer to the goal of ending hunger by 2030, which was adopted by the UN in 2015. The number of people suffering from hunger and malnutrition on our planet is **projected to reach 828 million by end-2022**, which is about 150 million more than before the outbreak of the COVID-19 pandemic (Figure A). If the trend does not change, the number will grow further, exceeding 840 million by 2030, or 9.8% of the world's population.

Food is the "new oil" — the political importance of food exports will be growing. The cost of food has risen significantly, first under the impact of the coronavirus pandemic and the measures to combat it and, then due to a surge in geopolitical tensions, sanctions, destruction of global supply chains, a fuel and energy crisis, higher production costs — in particular as a result of rising energy and fertilizer costs — and an increase in the number of food trade restrictions (Figure B). The food price index has increased by **46.5%** over the past two years — the FAO index was **98.1** in 2020, **125.7** in 2021, and **143.7** in 2022. Food prices have hit record highs, entering uncharted territory and despite some decrease since the second half of 2022, they still remain significantly higher than in 2021.

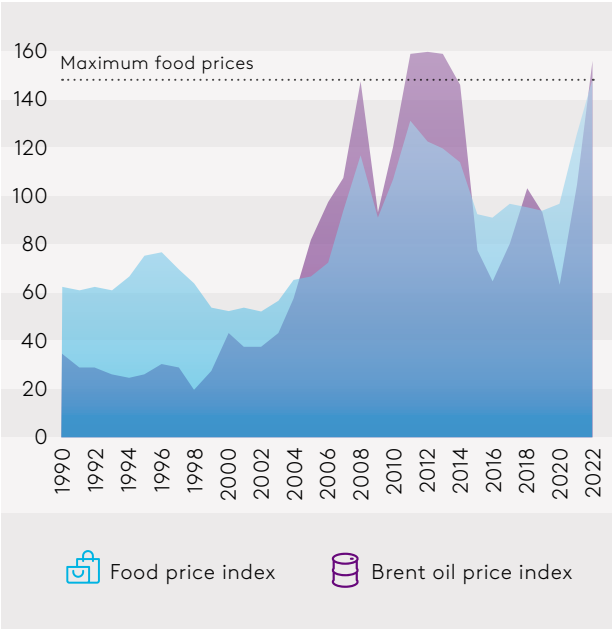
[1] EAEU countries, Uzbekistan, and Tajikistan.

↓ Figure A. Number of Undernourished People and Prevalence of Undernourishment in the World



Note: * estimated value.
Source: FAO.

↓ Figure B. Food and Oil Price Indices



Note: 100 = the average for 2014–2016.
Source: UN, WB.

We forecast a prolonged period of high food prices. This will be driven by: world population growth; high prices on energy and energy derivative products (including fertilizers made from natural gas); scarcity of skilled labour; higher energy value of the average diet in rapidly developing countries; limited prospects of opening new lands up for farming in many regions of the world (this option remains open mainly in countries of the former Soviet Union, China, the United States, and Canada); and projected adverse effects of climate change. The value of food resources increases as the accessibility of food declines.

The Eurasian region as a whole ensures its food security. The level of self-sufficiency for most products exceeds **80–95%** in the Eurasian region — the level established to define the concept of "food independence". The highest levels of self-sufficiency are for cereal crops and oilseeds, and the lowest for fruit (Figure C).

↓ Figure C. Level of Self-Sufficiency in the Eurasian Region (%)

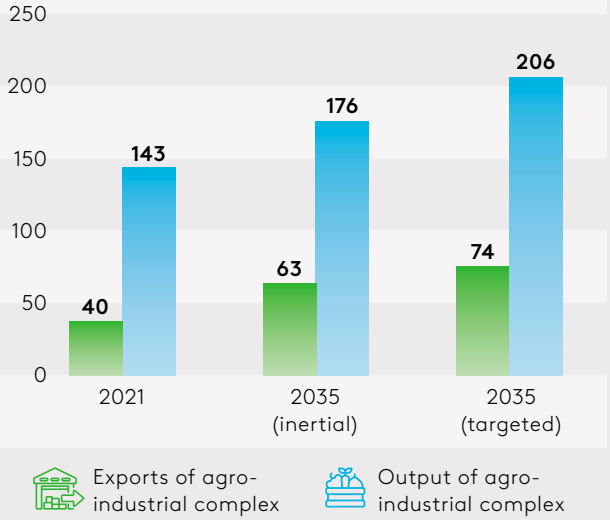
	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia	Tajikistan	Uzbekistan	Eurasian region
Grain	20	90	125	62	150	61	73	132
Potatoes	101	100	104	99	88	96	88	92
Vegetables, melons, and gourds	102	103	108	96	87	102	129	103
Fruit and berries	103	57	38	111	44	96	122	65
Meat of all types	61	134	82	87	101	92	96	100
Milk and dairy products	83	263	93	110	84	99	99	97
Eggs	100	128	100	90	98	98	100	99
Sugar	12	141	8	68	100	0	0	84
Vegetable oils	1	220	91	11	117	24	44	151

Source: EDB calculations.

The realisation of the **production and resource potential of the agro-industrial complex** will generate the following positive effects for the Eurasian countries by 2035:

- **agricultural output will increase by USD 29 billion** (+20%) under the inertial scenario and **by USD 59 billion** (+40%) under the targeted scenario compared to the current value;
- **gross output** in the economy **will increase by USD 55 billion** and **USD 112 billion** under the inertial and the targeted scenarios, respectively, as a result of multiplier effects, taking into account direct and indirect effects on related industries and the economy in general;
- **production multipliers** for gross output in the agricultural sector (USD per 1 USD of output in the sector), calculated based on "input-output" tables, are estimated at (in order of importance): **2.62** for Russia, **2.49** for Kyrgyzstan, **2.49** for Tajikistan, **2.44** for Belarus, **1.95** for Kazakhstan, **1.95** for Uzbekistan, and **1.77** for Armenia;
- **food exports will almost double** in value terms, going up from **USD 40 billion** (at 2020 prices) in 2021 to **USD 64–74 billion**, depending on the scenario, in 2035 (Figure D).

↓ Figure D. Food Production and Export in the Eurasian Region (USD billions)



Exports of agro-industrial complex	2021	Inertial	Targeted
Armenia	0.7	1.3	1.3
Belarus	6.0	7.4	10.2
Kazakhstan	3.2	4.6	6.2
Kyrgyzstan	0.3	0.3	0.4
Russia	28.1	47.5	53.8
Tajikistan	0.0	0.1	0.1
Uzbekistan	1.5	1.9	2.2
Total	**39.8**	**63.1**	**74.2**

Source: EDB calculations.

Box A. Methodology for Preparing Scenario-Based Calculations

We considered two main forecast scenarios for the agro-industrial complex development in the countries of the region: an inertial scenario and a targeted one. The **inertial scenario** is based on the assumption that the current trends in the development of the agricultural sector would remain unchanged, ensuring moderate growth of domestic production due to constraints related to capital, management resources and skilled labour, technologies, agricultural machinery, equipment, and other resources needed for investment and current production purposes[2].

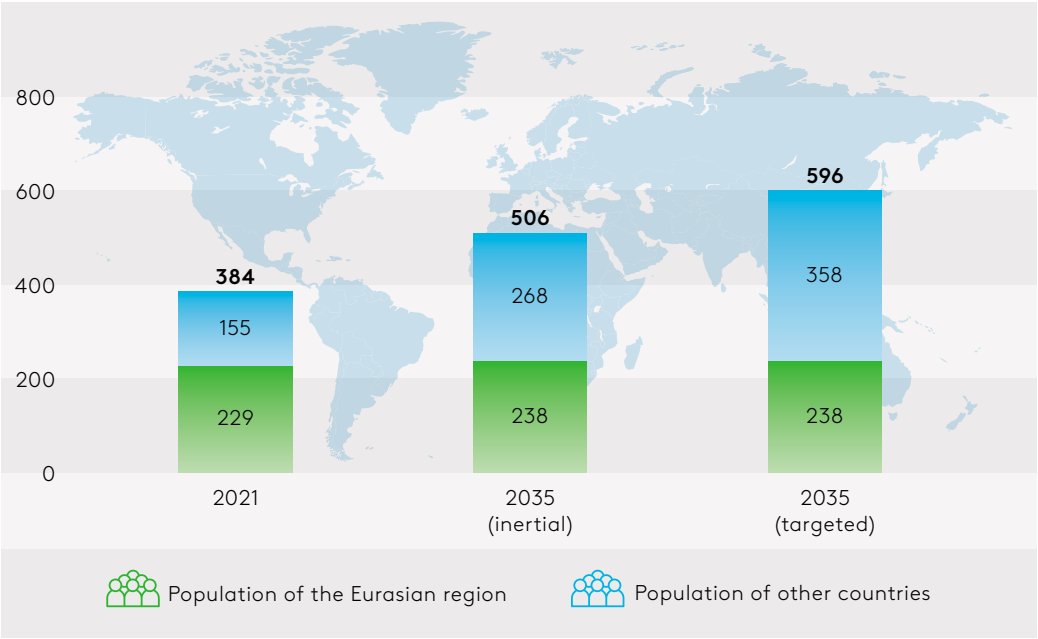
The **targeted scenario** is based on the planned indicators of agro-industrial development established in policy documents of the Eurasian countries, or the self-sufficiency rates prescribed in strategic documents on food security[3]. The balance of mutual trade and production plans of the countries in the region is also taken into account. This scenario assumes that the countries of the Eurasian region would focus more on self-sufficiency in those basic food products that are characterised by high dependence of the domestic market on imports, but where resources are available to expand their domestic production. The scenario also assumes a more significant increase in per capita consumption — up to the level of developed countries for many products — as a result of state support and rising household incomes.

Under each scenario, **export potential** is estimated based on projected balances of domestic production of basic foodstuffs and imports of agri-food products less domestic consumption for food and production purposes. The estimate of the **potential number of people** that the region could feed is based on the forecast of food production in calorie equivalent divided by the average caloric value of the diet per person.

[2] A more detailed description of the scenarios is on page 47.

[3] If the rates did not exceed the potential of extensive and intensive growth of domestic production.

The Eurasian region will be able to feed 600 million people. If the region realises its production, resource, and export potential, it will be able to feed **240 million** of its own population and an additional **360 million** in third countries (Figure E). In the context of rapid growth of the world's population and limited production and resource potential of other macroregions, the aggregate position of the Eurasian countries on the international food market will improve significantly.



← **Figure E. Number of People Depending on Food Produced in the Eurasian Region (millions)***

Note: * calculations as at 31 August 2022.

Source: EDB calculations.

Ensuring food security is a top priority of the agro-food policy in the Eurasian countries. At the same time, **increasing agricultural exports** will allow for greater realization of existing resource potential (without compromising food security) and will have a positive impact on the overall economic and socio-economic situation in rural areas.

However, there are still significant differences among countries within the Eurasian region in both food production and food consumption. In 2018, the share of households with consumer expenditure below the cost of a food basket based on rational standards, was 45–50% in Russia, 40–45% in Belarus, 65–70% in Armenia, 70–75% in Kazakhstan and Kyrgyzstan, with lower national standards for rational consumption in Armenia and Kyrgyzstan. This indicates low purchasing power of household disposable incomes and insufficient affordability of adequate quantities and assortment of food products. The problem of ensuring the affordability of food for all citizens is far from being solved, and the diet remains unbalanced. A broader concept of food security should be applied to assure its achievement in all countries in the region.

Box B. Food Security Is Assured in the Most Effective Way through Smooth Operation of Export and Import Channels

According to the definition adopted by the UN Food and Agriculture Organisation (FAO), food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. At present, about 80% of the global population lives in countries that are net importers of food. Therefore, there is no need for domestic production of all types of food to ensure the food security of a given country. Depending on the climatic and other conditions, it may be unprofitable or impossible to produce certain types of food in adequate quantities. Effective foreign trade mechanisms, on the other hand, make it possible to obtain earnings from exports of surplus food with the highest profitability and, in exchange, to import the required quantities at prices that are lower than they would have been if produced domestically.

The expansion of mutual trade and cooperation among the Eurasian countries and maintaining smooth operation of international trade mechanisms are important elements in ensuring food security in the region. Mutual trade among the EAEU countries, Tajikistan, and Uzbekistan has been growing steadily and reached USD 15.4 billion in 2021, which is 33.6% of the region's agro-industrial exports. **Over the past 20 years, the volume of mutual exports of agro-industrial products has increased by a factor of 8.5.** Developing mutual trade between countries in the Eurasian region allows, first, for building partnership relationships within the Union and, second, for focusing efforts not on achieving food independence, but on **improving economic and physical availability of food products,** including by expanding supplies from neighboring countries.

Transport and logistics constraints are the main factors impeding realisation of the region's agro-industrial potential. For example, the losses of domestic agricultural products due to underdeveloped logistics and storage systems within the countries of the Eurasian region reach 40%. According to the World Bank's Logistics Performance Index[4], the development of logistics systems remains at a relatively low level in the region — the Eurasian countries are in the below-average group (ranking from 77th to 147th). As a result, about 70% of food that could be produced in the countries of the Eurasian region is imported from third countries.

To remove those constraints, **it is necessary to have a cohesive transport infrastructure** in the form of motorways and railways, seaports, border crossing points, wholesale distribution centres, agrologistics facilities, etc. Therefore, comprehensive development of a **unified Eurasian Transport Framework** gains in importance. Logistics development should be based primarily on modern digital technologies. The solution will be to create a **Eurasian Commodity Distribution Network** that would improve planning accuracy and reduce delivery times, ensure product safety, enhance the efficiency of payment services and increase the promptness of ordering and returning goods.

[4] Logistics Performance Index, LPI.

China, the Middle East, North Africa, and India are lucrative markets for the countries of the Eurasian region. Based on the FAO-OECD long-term forecast of the volume of imports of agro-industrial products by the largest importing countries, as well as on the historical pattern of the EAEU's share in agricultural imports of those countries, the most promising destinations for realisation of the agricultural export potential are Southeast Asia and the Middle East, in particular Saudi Arabia, Iran, Egypt, China, India, and Vietnam. The analysis also revealed that the potential capacity for food imports from those countries exceeds the projected volumes of exports by the EAEU countries, Uzbekistan, and Tajikistan, which points to additional opportunities for expanding exports to foreign markets.

To access lucrative markets, logistics along the southward and the eastward routes should be enhanced. Taking into account the persistently high risks to food security and the significant number of undernourished people in India, most countries in Asia, the Middle East, and North Africa, **the role of the International North-South Transport Corridor in food delivery will increase.** It is also necessary to develop new logistics routes via Central Asia and establish new routes to China or expand the capacity of existing ones.

Box C. Development of Logistics along Eastward and Southward Routes Is a Condition for Realising the Export Potential of the Eurasian Region

Addressing logistics problems along the southward and eastward routes is key to realising the export potential of the Eurasian region. However, unlike the eastward route, which is quite well-developed and continues to improve along the Transsib and TRACECA corridors, the southward route is still not operating successfully along its entire length and has so far failed to attract significant freight traffic. The North-South International Transport Corridor (ITC) connects the northwestern part of the EAEU with the states of Central Asia, the Persian Gulf, and the Indian Ocean. A comprehensive solution for food exports is to develop that corridor, which provides access to the most lucrative sales markets in China, the Middle East, and India, ensuring the shortest haulage distances for food transportation.

Food will become one of the most widespread types of cargo that will be transported in both the southern and northern directions of the North-South ITC. Notably, cargo in this group needs to be transported using specialised rolling stock (insulated rail cars and refrigerated containers), as a significant part of food cargo is perishable. By 2030, the North-South ITC could attract up to 25% of all freight traffic (Vinokurov, Ahunbaev, Shashkenov et al., 2021).

To realize the potential of the agro-industrial complex, it is expedient to encourage the development of large Eurasian players both at the national level and at the level of the EAEU. Such players should include participants throughout the entire chain of food production and export, including direct production, processing and handling, transportation and storage (including refrigeration), trading, retail, export logistics, and other areas. That would raise productivity and enhance the competitiveness of food products produced in the Eurasian region in export markets, as well as reduce losses by improving logistics. The engagement of major players will significantly simplify the development of a commodity distribution network in the region, as it will be much easier for them to build a network of logistics centres and saturate the industry with modern vehicles.

However, the emergence of major and effective market players is a challenge and could take considerable time, especially in the Central Asian countries and Armenia. **Creating incentives for the cooperation among small farms** should therefore be another vital theme. Cooperation can be developed by building special institutions, which would help mitigate the problem of small-scale production, for example, through the formation of an effective procurement system for agricultural products, a network of machine and tractor stations, service and procurement centres, etc.

For Central Asian countries, the main structural constraint is water scarcity. In the future, the scarcity will intensify in countries with an arid climate, limiting the potential expansion of the agricultural land. The solution to the issue of food security is, therefore, strongly linked to improving the efficient management of the **water and energy complex of Central Asia** and the use of moisture-saving technologies.

Box D. Linkages with Development of the Water and Energy Complex of Central Asia

The economies of Central Asia are characterised by a high level of energy and water intensity of various economic sectors, primarily agriculture and manufacturing. The social and economic development of the Central Asian countries in the Aral Sea basin has been accompanied by depletion of water resources for a long time, and that factor determines the key vector of interstate relations among the countries. The water shortage in the region is largely attributable to poor management of water use in agriculture and manufacturing, the unsatisfactory state of water management facilities, and insufficient funding for their maintenance and development.

Water withdrawal per capita has generally halved in Central Asia since the Soviet period, going down from 3,500 m^3 to 1,540.7 m^3 in 2018. The Central Asian countries continue to experience water shortages, and, under the international classification, they fall in the category of "water stressed" countries, with a threshold of 1,000 to 1,700 m^3/person/year. Under the moderate scenario of developments in Central Asia, this trend will persist over the long term. In case of insufficient regional economic cooperation, including unsatisfactory water and energy integration, the Central Asian countries may approach a state of "water scarcity" by 2050 (1,296 m^3/person/year, while the threshold is 1,000 m^3/person/year).

Critical scarcity of water resources, their uneven distribution among the countries, and mounting environmental problems in the region call for concerted efforts and economic integration on the basis of shared interests (Vinokurov, Ahunbaev, Usmanov et al., 2022).

The high dependence of the agro-industrial complex in the Eurasian region on imports of investment and intermediate goods can also become a challenge in maintaining the region's food security. The countries applying sanctions against Russia and Belarus supplied agricultural machinery and components (up to 50–100% for certain types), and seeds (in the Russian Federation — 98% for sugar beets; 89% for winter rapeseeds; 88% for potatoes; 73% for sunflowers; 58% for corn; and 53% for peas and spring rapeseeds). A decrease in imports in response to sanctions could lead to a sharp reduction in the sown area and/or lower yields. In animal husbandry, the rate of dependence on imports of hatching eggs and chickens was 95–100% for table poultry production and 75–80% for egg production.

The share of imports was also high for supplies of breeding stock and pedigree material, equipment for animal husbandry, feed additives, and veterinary drugs. In the near future (2023–2024), it is essential to secure uninterrupted supply of those materials to the region.

To address the problem in the long term, it is necessary to **accelerate development of the technological base of the agro-industrial complex with state support**, including by relying on existing players, in the following areas: seed production; pedigree livestock breeding; production of complex fertilizers, veterinary drugs, and feed additives; and measures to develop agricultural science. Close attention should be paid to reviving domestic selective breeding and genetics.

Import substitution in mechanical engineering is also a vital area of development. It is becoming critical to develop the production of agricultural machinery, including equipment for animal husbandry, poultry farming, pig breeding, and dairy cattle breeding, including high-tech segments, as well as the production of rolling stock for railways (refrigerator vehicles, carriages and containers, tanks for transporting vegetable oil, etc.) and the fleet for marine shipping, including a merchant fleet.

A separate set of measures should be focused on the creation of a favourable regulatory environment: designing policies aimed at stimulating the domestic demand to mitigate the risks of overproduction (procurement interventions, targeted social assistance to low-income people, etc.); and elimination of barriers and restrictions within the EAEU (in technical regulation, transport policy, public procurement, and tax policy). Certain risks for the development of the agro-industrial complex are arising in some countries of the Eurasian region (Belarus, Uzbekistan, Kazakhstan) due to the measures taken to achieve import substitution and food independence at the national level, which are regularly used in all countries of the Eurasian region. Even at the level of the EAEU, the adopted principles of economic integration are not always followed by member countries in case of conflicts with their national interests.

Forecast calculations show that, despite significant potential for growth in domestic consumption, **internal competition among producers in the Eurasian region may intensify in the future on markets for grain products, dairy products, meat, vegetables, and fruits.** In these circumstances, countries with a large national market (Russia, Kazakhstan, Uzbekistan) could pursue a relatively soft policy of regulating imports and focus on developing those sectors of agriculture that have the greatest prospects for exports to third countries.

Another important area is **accelerated enhancement of the financial infrastructure to support the agro-industrial sector**, including the development of mutual settlements in local currencies, creation of a unified insurance and reinsurance infrastructure to support export operations, etc.

Accelerating development in this direction will also be facilitated by **increasing the role of regional commodity exchanges.**

INTRODUCTION

Disruptions of supply chains for goods, reconfiguration of transport routes, and a sharp increase in prices for inputs have caused changes in the global model of trade, production, and consumption. This has led to significant hikes of world prices, including food prices. The global economy is facing the biggest commodity shock since the 1970s, exacerbated by a sharp intensification of restrictions in trade in food, fuel, and fertilizers. The World Bank estimates that commodity and food prices will remain high until the end of 2024.

A food crisis is usually seen as one of the main risks threatening the global economy. Risks to global food markets are being exacerbated by the intensification of natural disasters, the consequences of the pandemic, and the conflict between Russia and Ukraine, two major food and fertilizer producers.

In this context, ensuring food security and developing the potential of the agro-industrial complex have become top priorities for the Eurasian region, which, for the purposes of this report, includes the EAEU member states, as well as Tajikistan and Uzbekistan[5]. The countries in the region have achieved a high level of food self-sufficiency over the recent years; however, there is still a high degree of dependence on imports of many product categories classified among the intermediate products of the agro-industrial complex (sowing and breeding materials, pure-bred breeding stock, grandparent herds, agricultural chemistry, etc.), equipment, and special machinery. Significant quantities of high-tech capital goods for crop production and animal husbandry are imported into the domestic market of the Eurasian region. In the new geopolitical reality, food security challenges faced by the countries of the region are a priority and call for urgent yet balanced solutions.

The countries of the Eurasian region face the challenge of ensuring food security and tapping the huge production, resource, and export potential of the agro-industrial complex. This potential is based on: 1) the historically shaped specialisation of the Eurasian region in agriculture and food production; 2) the production base created to ensure food security; 3) the natural, climatic, and geographical advantages for major players in the region — Russia, Belarus; 4) the underinvestment in the agro-industrial complex; 5) the significant untapped potential of the agro-industrial complex in Central Asia, which is currently hampered by inefficient regulation of the water and energy complex at the regional level, critically low water use efficiency, as well as transport and logistics constraints.

Therefore, this paper explores the potential of the Eurasian region in ensuring its own food security, expanding production volumes, and promoting food exports to world markets, primarily the markets of Greater Eurasia (including India and China), in the context of a potential food crisis in some countries, sanctions, climatic and other relevant challenges faced by the countries of the region, and taking into account plans for infrastructure development (transport, logistics, water use).

[5] The two countries are actively engaged in Eurasian integration processes — Tajikistan is an EDB member country, Uzbekistan has observer status in the EAEU — and, together with Kazakhstan and Kyrgyzstan, which have already joined the Union, form an actively developing macroregion in Central Asia (see Vinokurov et al., 2022).

1. FOOD SECURITY WORLDWIDE AND IN THE EURASIAN REGION

1.1. Global Food Security

Humanity has faced the problem of hunger, or food insecurity, throughout its history and, despite all the efforts of international organisations, the issue is still unresolved. In 2015, recognising the severity of the problem, the UN included the fight against hunger in its Sustainable Development Goals (SDGs), putting it in second place (after the eradication of poverty). The following targets have taken shape as part of the SDGs: to end hunger, food insecurity, and all forms of malnutrition by 2030.

Box 1. UN Sustainable Development Goals (SDGs) related to ending hunger:

2.1. By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious, and sufficient food all year round.

2.2. By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons.

2.3. By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and agricultural inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment.

2.4. By 2030, ensure sustainable food production systems and implement resilient agricultural practices that contribute to improved productivity and expanded production; help maintain ecosystems; enhance the capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters; and progressively improve land and soil quality.

2.5. By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilisation of genetic resources and associated traditional knowledge, as internationally agreed.

2.a. Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.

2.b. Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round.

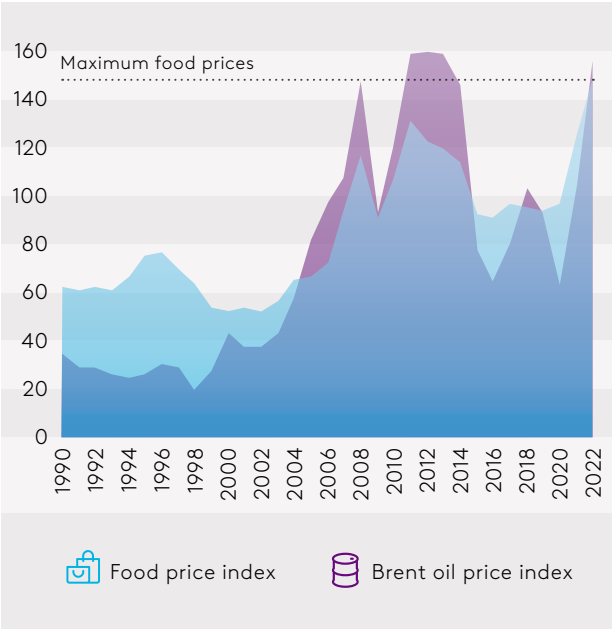
2.c. Adopt measures to ensure the proper functioning of food and processed food markets and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.

However, due to the impact of the COVID-19 pandemic and the measures taken to combat it — which caused disruptions to global supply chains and accelerated inflation — aggravated by the fuel and energy crisis, humanity has been unable to make significant progress towards achieving these goals. Meanwhile, the impacts of the pandemic are among the factors contributing to falling incomes and mounting inequality, which also limits the access of the population to food. Climate change (desertification and drought) and the Russia-Ukraine conflict contribute further to the deterioration of global food security, boosting world food prices. Final food prices are mainly affected by high fertilizer prices and rising transport and energy costs. Moreover, stronger regionalisation of the global economy, growing geopolitical tensions and sanctions pose a threat of exacerbating this problem many times over. The UN recognises that, since the adoption of the targets for ending hunger in 2015, after a brief period of improvement, the performance indicators have practically returned to their starting points (FAO, 2022).

In 2019–2021, hunger rates worsened in Africa, Asia, Latin America and the Caribbean, reflecting growing inequalities among and within countries. In 2021, 2.3 billion people faced moderate or severe food insecurity, and 9.8% of the world's population was in a situation of severe food insecurity, i.e. hunger. Note that the number of hungry people is the highest in Asia with 56%, followed by Africa with 37%, Latin America and the Caribbean with 7%.

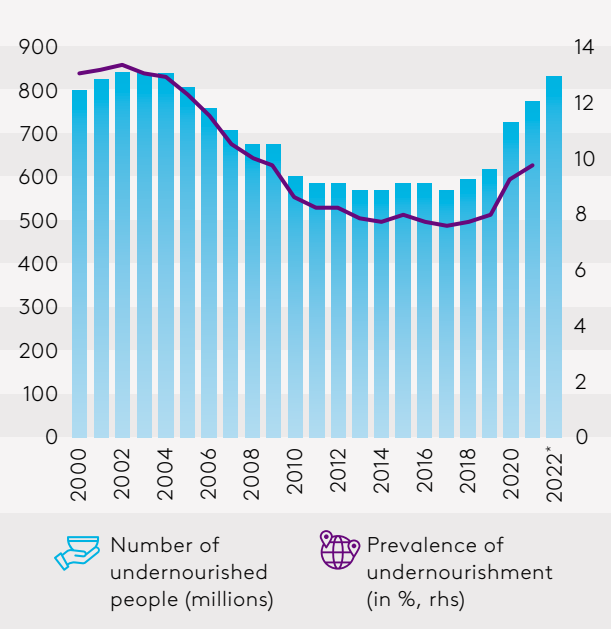
If this trend does not change, by 2030, the number of people suffering from hunger will exceed 840 million, or 9.8% of the world's population. These estimates are unchanged compared to the 2015 projections, when the UN 2030 SDGs were set. However, taking into account the trend, the UN concludes that, at present, when there are only eight years left to achieve the targets of ending hunger and all forms of malnutrition and ensuring food security (SDG 2.1 and SDG 2.2), the global community is drifting away from the goals.

↓ Figure 1. Food and Oil Price Indices



Note: 100 = the average for 2014–2016.
Source: UN, WB.

↓ Figure 2. Number of Undernourished People and Prevalence of Undernourishment in the World



Note: * estimated value
Source: FAO.

To achieve the SDGs, average global agricultural productivity must increase by 28% over the coming decade — i.e. growth should be more than three times that of the past decade. This calls for an increase in the average global crop yield by 24%, which is almost double the rate achieved over the past decade (13%). Productivity of global meat production should increase by an average of 31%, which is also significantly above the trend of the past decade.

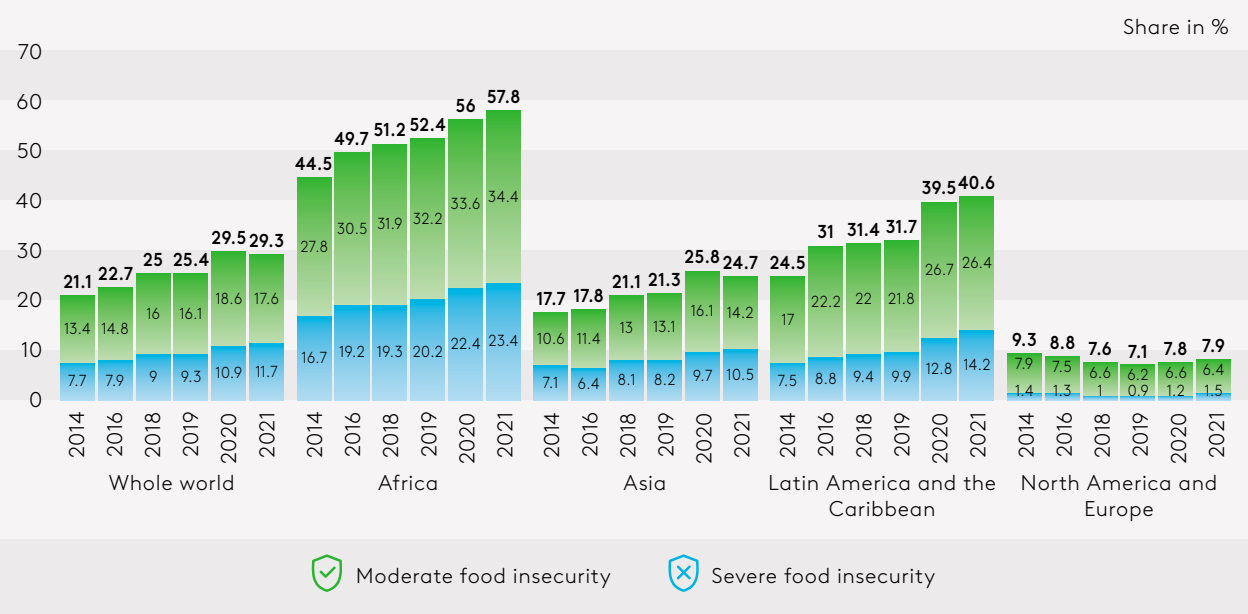
Global food security remains fragile. The military conflict between Russia and Ukraine swiftly affected the global food trade, creating large risks for the global agricultural system and food security. Supply chain disruptions have resulted in a surge in global prices. Russia and Ukraine are the world's major producers and exporters of wheat, corn, barley, and sunflower oil. Russia and Ukraine account for 53% of sunflower oil and seeds (17% and 36%, respectively), 27% of wheat (18% and 9%), 23% of barley (12% and 11%), and 14% of corn (1% and 13%) supplied to the world market. Russia and Ukraine provide almost one eighth of all calories sold worldwide. In 2021, Russia and Ukraine were the world's first and fifth biggest exporters of wheat, shipping 39 million tonnes and 17 million tonnes, respectively. About 50 countries depend on Russia and Ukraine for more than 30% of their wheat imports, and 25 countries got more than 30% of their fertilisers from Russia (The Economist, 2022a). Moreover, Russia and Belarus are the world's second and third largest producers of potassium, a key fertilizer ingredient.

There is a major food crisis looming in the current environment of great geopolitical tensions and intensified military conflicts; the surge in world prices for food, fertilizers, and energy resources; the realignment of global supply chains; and the high probability of a global recession.

Low-income countries are the most severely affected by the food crisis. Poverty rates are likely to increase and food availability will decrease in those countries amid global price hikes. Households in emerging economies spend 25% of their budgets on food, while those in sub-Saharan Africa — as much as 40% (The Economist, 2022b). Having drawn down their funds during the pandemic, developing countries have no resources to provide additional support to their population to mitigate the impacts of rising prices.

The UN World Food Programme has called 2022 "a year of unprecedented hunger" (WFP, 2022), and the number of hungry people is estimated at 828 million this year.

↓ Figure 3. World Food Security



Source: FAO, 2022.

One of the key risk factors for global food security is the major increase in food prices, which significantly reduces food affordability. Food prices have risen sharply over the past two years and are likely to go up even further (Figure 1). The increase since mid-2020 has been caused by factors such as the recovery in demand after the COVID-19 crisis, an adverse impact of weather conditions on supply, a growing number of food trade restrictions, and rapidly rising production costs, in particular the costs of energy and fertilizers. Last year, those were aggravated by geopolitical and sanctions risks, which have had a significant impact on markets for agricultural products and production resources, especially cereal crops and oilseeds, as well as mineral fertilizers and energy.

However, while oil prices are still on their way to historic highs, the food price index is already hitting record highs, entering uncharted territory. This means that never before in history has access to food been so low. The planet will face a long period of high food prices and low access to food for the entire population. Even countries that were well off in this regard in the past may face problems with ensuring food security.

The sharp contraction of access to food significantly raises its value, placing food on a par with oil, but with more severe consequences for the health and livelihoods of the population in case of scarcity. In this context, for many countries that have the necessary natural resource potential to expand food production, an increase in food exports may become a factor as important for supporting economic growth as oil exports once were for oil-producing countries.

In the longer term, high food prices will be supported by a combination of the following factors: 1) population growth; 2) high prices for energy and energy derivative products (including fertilizers made from natural gas); 3) scarcity of skilled labour due to increased urbanisation; 4) higher energy value of the average diet in rapidly developing countries; 5) limited prospects of opening up new lands for farming in many regions of the world (this option remains open mainly in countries of the former Soviet Union, China, the United States, and Canada) (Tibi et al., 2020); and 6) potential adverse effects of climate change on the production efficiency of the agro-industrial complex, taking into account the slowdown in its growth over the past two decades.

The global population is projected to grow from 7.8 billion in 2021 to about 8.6 billion in 2031 (OECD-FAO, 2022). Then, the UN forecasts that it will increase to 9.7 billion in 2050. Two-thirds of the increase is expected to come from sub-Saharan Africa, India, the Middle East, and North Africa. Therefore, those regions will account for a significant share of the additional demand for food, in particular cereals (two-thirds of the additional demand) and other staple foods (root crops, tubers, and legumes). The continuing rise of incomes and urbanisation in China, India, and Southeast Asia will also boost the demand for a range of food commodities. China is expected to account for 41% and 34% of additional global demand for fish and meat, respectively, and half of the additional global demand for fresh dairy products will come from India.

Climate change and declining land and water resources have a negative impact on the sustainability of agriculture around the world. Increasing deserts and rising sea levels could result in a significant loss of agricultural land. In regions with a cold climate, on the other hand, the climate is expected to become milder, but since it is almost impossible to accurately predict actual changes, the effects of such developments may be unpredictable (Apanovich et al., 2022). However, according to most forecasts, the expected climate changes are more likely to have a positive effect on the countries of the Eurasian region.

At the same time, efforts to combat the climate change may also have a negative impact on global food security. For example, initiatives to limit animal husbandry, which is a source of significant quantities of methane, and to stop deforestation reduce the opportunities for agricultural land expansion (Apanovich et al., 2022). Gro Intelligence estimates that the calories diverted by current biofuel production and climate commitments made by countries may be equivalent to the yearly food needs of 1.9 billion people (The Economist, 2022a).

The policies of global corporations, food producers, and distributors also have a significant effect on the food price hikes. Food prices may be subject to speculative pressures. Given the risks to production associated with climate change, the threat of additional market pressure on rising prices may become even more severe.

Free trade is one of the key conditions for ensuring global food security, as 80% of the global population live in countries that are net importers of food. More than 20% of the world's calories, and more than 18% of its grain, cross at least one border (The Economist, 2022a). World economies have drastically increased the number of food and fertilizer trade restrictions to protect their domestic markets. At least 23 countries have implemented 33 food export bans, and at least seven have implemented 11 export-limiting measures (export licenses, taxes, quotas) (World Bank, 2022a). For instance, India, which planned to export 10 million tonnes of wheat (about 5% of global wheat exports) in 2022, imposed a ban on wheat exports in May, amid a scorching heat wave resulting in curtailed output and a hike of domestic prices (Jadhav, 2022). Export bans and restrictions directly and indirectly affect food inflation by reducing supply. Countries are equally active in easing import restrictions, boosting demand and — in the face of mounting shortages — food price inflation. Experts estimate that for staples, such as wheat, rice, and soybean oil, export bans have pushed prices up by 9% or more (Espitia et al., 2022).

The problem of global food security should be considered in the context of the "food — water — energy" nexus (Apanovich et al., 2022). Rising food prices have ceased to be an incentive for producers, who are less motivated due to increased fertilizer and electricity prices and volatile prices for agricultural products (The Economist, 2022b). Farmers are considering switching to crops with lower production costs. For example, many US growers intended to move from maize to soya beans in 2022 (The Economist, 2022a).

1.2. Food Security in the Eurasian Region

Concept of Food Security

The modern concept of food security was first formalised in the Report of the World Food Conference convened under the auspices of the UN in 1974. The term "food security" was defined as "availability at all times of adequate world supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices" (UN, 1975).

In 1996, the World Food Summit adopted the following definition of food security: "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996).

By the end of the first decade of the 21st century, those concepts had developed further, with four key aspects of food security defined: food availability and affordability, its rational utilisation, and reliability of food supply (see Annex 1).

The food security concept changes over time, reflecting the evolution of ideas about current threats and risks to providing the population with food, and about the targets of and constraints on social and economic development (see Annex 1).

The current concept of food security distinguishes six "dimensions" (groups of criteria) used to assess the situation in terms of providing the population with food:

(1) Availability of food: A quantity and quality of food sufficient to satisfy people's dietary needs should be available as a result of production, stock utilisation, and/or imports;

(2) Affordability of food: An adequate quantity of food should be accessible for consumers, taking into account the purchasing power of household incomes, including vulnerable groups;

(3) Mode of utilisation of food: Food must be processed and stored so as to be of good quality and safe for health;

(4) Reliability of food supply: Food availability should not decline due to adverse weather conditions or instability because of political, economic, or other shocks;

(5) Sustainability of food systems: Food systems should develop based on practices that contribute to regeneration of natural, social, and economic factors they use, ensuring that the food needs of the present generations are met without compromising the food needs of future generations;

(6) Inclusiveness: The capacity of individuals or groups to make their own decisions about what foods they eat, what foods they produce, and their ability to engage in processes that shape food system policies and governance.

However, there is no country in the world where the food situation would meet the full range of those requirements.

In the process of their social and economic development, countries first address the most acute problems of ensuring availability and/or affordability of food, and then the objectives of improving the efficiency of agro-industrial complexes and strengthening the reliability of food supply become more urgent. The emergence of new criteria for assessing food security — criteria 5 and 6 above — is identical to "identifying" new challenges calling for appropriate adjustments of policies in that area.

Many different food security issues coexist at any given time. But actual food security policies are determined only by a certain subset of those problems and, by extension, a subset of targets that, on the one hand, are perceived by the society and the regulator as the most relevant and, on the other, can be achieved with the available resource potential of the economy and the existing mechanisms for its utilisation.

In principle, social and economic development cannot be absolutely secure. Definitions of food security usually describe it as an ideal state, but the practical implementation of its criteria in the process of social and economic development is limited by several essential factors.

First, any security is a public good that comes at a price. The resources available to the society at any point in time are not sufficient to achieve the entire range of social and economic development targets and ensure all aspects of security, including food security. Current social and economic policy goals compete for limited resources, and the key task of governance systems is to select priorities and effectively mobilise resources for those areas.

Second, the overall social and economic context serves as the basis for substantiating specific food security policy goals and their quantitative targets (criteria). It includes policies in welfare, incomes, prices and social guarantees, foreign trade, agriculture, and overall agro-industrial development. The targets formulated in those areas are not generally a coherent system. There may be a conflict between the targets put forward for various aspects of food security plus the targets of food security policy, on the one hand, and various social and economic policy areas, on the other.

Here are some current examples of the conflict between different food security policy targets:

- A conflict between the targets of improving the availability and affordability of food and the target of food independence in a situation where the national agro-industrial complex is insufficiently developed. Higher food requirements can be met through imports, which, other things being equal, would lead to lower self-sufficiency. Limiting competing imports as one of the tools to support domestic production would, however, be manifested in higher self-sufficiency, but in the short term it might have a negative impact on the availability and affordability of food, as well as its quality, due to weaker competition.

- A conflict between the target of reliability of food supply and food independence in a situation of high volatility in domestic agricultural production. In some cases, consumption can be stabilised through compensating imports, which would result in weaker food independence.

- Meeting the target of improved availability of a wide variety of food products in regions with low population density, other things being equal, should lead to higher prices and relatively lower affordability of food due to greater logistical and storage costs.

- Meeting the target of improving the reliability of food supply is associated with additional costs, such as those related to maintaining inventories and making emergency purchases on the foreign market, which, other things being equal, might boost food prices and reduce the affordability of food.

The following examples illustrate the conflict between food security policy and agricultural development policy targets:

- If a significant role in ensuring the affordability of food is played by curbing food inflation, this would prevent the achievement of the agri-food policy target of expanding food production and improving food quality. After all, the fundamental prerequisite for the latter target is an increase in supply prices for the agro-industrial complex while eliminating accumulated price disparities in agriculture, which determine the low efficiency of agricultural production.

- Meeting the food security policy target of rational utilisation of food — reducing the loss of agricultural raw materials and food during production, processing, storage, transportation, and consumption — can lead to a reduction in the physical food requirement and at least a relative reduction in market size for food and agricultural raw materials. Other things being equal, this might pose additional constraints on the growth of output, incomes, and employment in agriculture, and exacerbate social and economic problems in rural areas.

- Successful implementation of the policy of agro-industrial development through export expansion could, if there is a favourable situation on world markets, cause an increase in exports of food resources that would reduce the availability and affordability of food on the domestic market. In other words, an increase in the output of agricultural raw materials and food is not sufficient to better meet the food needs of the population.

The "conflict" arises from the fact that food security criteria and criteria characterising other areas of social and economic policy move in opposite directions as a result of the same actions of the regulator or the same shifts in market conditions. The solution to any food security problem is based on tapping the opportunities arising as a result of a certain adjustment in agri-food policy and/or other social and economic policy areas. However, that adjustment, in turn, may worsen the conditions for addressing food security problems, as well as for developing certain sectors and the national economy as a whole. Thus, there is substantial interdependence between food security problems and their potential solutions.

The initial attractiveness of the concept of "security" should not make any options for its actual achievement in economic policy development and implementation attractive by default. A distinction should be made between the positive theoretical potential of the target of food security and the real multidimensional (mixed) consequences of selecting options for its definition and policy tools for its achievement. The specific historical nature of food security policy is manifested in the way it reflects the specific features of social and economic development.

Thus, it is a methodological imperative to address the conflicts arising in the context of food security policy design in a constructive manner, taking into account its interdependence with other areas of social and economic policy, and building each specific policy option as a system of clearly formulated compromises.

Approaches to Food Security in the Eurasian Region

Despite some differences in basic definitions and targets, the national concepts of food security developed by the countries of the Eurasian region are generally similar.

First, all the concepts include the basic conditions of affordability and availability of food. In this respect, they are aligned with the definition most commonly used in international practice and presented in the Declaration on World Food Security adopted by the World Food Summit (FAO, 1996).

Second, all countries of the Eurasian region either explicitly or implicitly (in concept or policy documents) use the concept of national food independence, which implies self-sufficiency at the level of 80–95% in terms of basic products of their agro-industrial complexes, the mass production of which is enabled in those countries by their agro-climatic conditions.

Third, the following are defined as mechanisms for ensuring food security: development of the domestic agro-industrial complex; formation and utilisation of state food reserves; and targeted social assistance to improve the affordability of food for the most vulnerable and low-income groups of the population.

In **Armenia**, food security means "adequate supply of a sufficient quantity of food of good quality and safety; acceptable by society in view of its social, cultural, and historical characteristics; accessible to every member of the society to be consumed at any time and in any situation — among other things in emergency situations and during a state of martial law — to lead a healthy and secure lifestyle". Ensuring the country's food independence is one of the main areas of the food security policy. The concept of food independence implies basic food self-sufficiency at the level of 84% in 2020 (in terms of energy value) (President of the Republic of Armenia, 2011).

In **Belarus**, food security is defined as a state of the economy in which, regardless of world market conditions and other external factors, residents throughout the country are guaranteed access to a quantity of food sufficient for an active and healthy life, while social and economic conditions are created to maintain a rational level of consumption of basic food products. A level of production that meets less than 80% of the needs of the domestic market is recognised as insufficient (Council of Ministers of the Republic of Belarus, 2017).

In **Kazakhstan**, food security is seen as one of the elements of economic security and implies a condition of economic robustness in which the state is able to ensure the availability and affordability of high-quality and safe food products for the population in a quantity sufficient to meet the physiological norms of consumption and ensure demographic growth. Food independence is not directly included in the definition of the country's food security, but is considered a key condition for achieving its economic security (LIS "Adilet", 2012). Food independence is considered unsecured if the annual output of basic food products covers less than 80% of the annual needs of the population in accordance with the physiological norms of consumption (LIS "Adilet", 2005).

In **Kyrgyzstan**, the adopted concept of food security includes ensuring food independence, along with the availability and affordability of food for the population in accordance with the established minimum standards of food consumption (Ministry of Justice of the Kyrgyz Republic, 2008). The low share of food imports in consumption is a condition for the country's food independence (Ministry of Justice of the Kyrgyz Republic, 2009). The threshold for food independence is 80% (as in Belarus).

In **Russia**, food security is interpreted as a state of the country's social and economic development that ensures food independence and assures the availability and affordability of quality food for every citizen in a quantity not less than the statutory standards of rational consumption. Food independence is defined as the country's self-sufficiency in the main types of domestic agricultural products, raw materials, and food. The following thresholds are defined: 95% for grain and potatoes; 90% for vegetables, melons and gourds, dairy products, sugar, and vegetable oils; 85% for meat; and 60% for fruit (Consortium "Kodeks", 2020).

In **Tajikistan**, food security is defined as "the ability of the state to guarantee that food needs are met at a level that ensures normal activity of the population. To achieve this objective, the availability and affordability of an adequate quantity and assortment of food for the population should be ensured" (Government of the Republic of Tajikistan, 2009). The National Development Strategy of the Republic of Tajikistan up to 2030 recognises ensuring food security and access of the population to quality food as a strategic goal. The Strategy provides for improving the food self-sufficiency to achieve 70% by 2030 and reducing the share of household expenditure on food to 40% of total income (Ministry of Economic Development and Trade of the Republic of Tajikistan, 2016).

In **Uzbekistan**, there is no explicit definition of the concept of food security in the legal framework. In 2019, the Ministry of Economy of the Republic of Uzbekistan drafted a law "On Food Security", which has passed the stage of public consultations (but has not yet been adopted) (Ministry of Economy of the Republic of Uzbekistan, 2018). The draft law defines food security as a state of the economy in which food independence is ensured and continuous availability and affordability of sufficient quantities of safe and quality food are guaranteed to meet people's dietary needs and preferences to lead a healthy and active lifestyle. Food independence is considered secured if the annual domestic output of vital food products covers at least 80% of the population's annual needs based on physiological standards of nutrition. Despite the lack of a clear legal definition, food security is seen as one of the strategic priorities of the Agricultural Development Strategy of the Republic of Uzbekistan for 2020–2030 (National Database of Legislation of the Republic of Uzbekistan, 2019).

On the **EAEU** level, the draft Concept Document on Collective Food Security of EAEU Member States of 2019 (EEC, 2019) defines collective food security as "the ability to ensure an adequate level of availability and affordability of food for the population of the member states in a quantity and quality sufficient to meet the criteria for a high standard of living, mainly through domestic production of agricultural products and food, based on efficient use of the resource potential of the agro-industrial complex, innovative development of industries, cooperation among the states, as well as balanced functioning of the Union's food markets". Although the draft concept document was not adopted, many of its provisions served as the basis for practical activities of the EEC aimed at improving food security and pursuing common agricultural policies within the EAEU.

The most recent document in this area is the General Principles and Approaches to Ensuring Food Security in Eurasian Economic Union Member States (Consortium "Kodeks", 2021). It focuses on non-discrimination on the Union's common agricultural market, as well as the need to combine the national interests of the member states and the goals of the Union, ensuring sustainable development of the agro-industrial complexes of the member states and the common agricultural market of the Union and taking into account international experience when assessing food security.

We can therefore conclude that the priority of food security policy in the countries of the Eurasian region is to ensure availability of food while mitigating the risks associated with imports of food resources as such, as well as elements of operating costs and equipment

for agro-industrial sectors from third countries. At the same time, some countries focus more on the affordability of food and its quality assurance. The green food security policy agenda is also gradually expanding, which entails ensuring various aspects of agri-food system sustainability, including mitigation of any negative impact on natural ecosystems and climate.

Food Security in the Eurasian Region in Terms of Food Sufficiency

According to the definitions used, the main indicators of food security in the Eurasian region include:

- self-sufficiency in basic agro-industrial products (the ratio of their domestic production to domestic consumption);
- the ratio between actual per capita consumption of basic food products and statutory norms (rational standards)[6].

Box 2. Food Products for Which Standards Are Established:

- in **Armenia:** bread products, potatoes, vegetables, fruit, meat and meat products, dairy products, eggs, sugar, vegetable oil, margarine, fish;
- in **Belarus:** bread products, potatoes, vegetables, melons and gourds, fruit and berries, meat and meat products, dairy products, eggs and egg products, sugar, vegetable oil, fish and fish products;
- in **Kazakhstan:** bread products, potatoes, vegetables, melons and gourds, fruit and berries, meat and meat products, dairy products, eggs and egg products, vegetable oil, sugar and confectionery products, honey, fish and fish products, tea, coffee, cocoa powder, yeast, bay leaves, ground pepper, vinegar, iodized edible salt;
- in **Kyrgyzstan**: bread products, potatoes, vegetables, melons and gourds, fruit and berries, meat and meat products, dairy products, eggs, sugar and confectionery products, vegetable oil, fish, tea, iodized edible salt;
- in the **Russian Federation:** bread products, potatoes, vegetables, melons and gourds, fruit and berries, meat and meat products, dairy products, eggs, sugar, vegetable oil, fish products, table salt;
- in **Tajikistan:** bread products, potatoes, vegetables, melons and gourds, fruit and berries, meat and meat products, dairy products, eggs, sugar, vegetable oil and fats, fish and fish products, tea;
- in **Uzbekistan:** no rational standards are defined by food products.

[6] The consumption standards for certain products differ slightly in the countries of the Eurasian region due to differences in food consumption patterns and in the abilities of national agro-industrial complexes to ensure adequate food supply, but they are generally established at high levels to meet not the minimum, but the targeted (average physiological) standards.

An analysis of supply and use balances for the food products that form the core of the food security basket shows that the countries of the Eurasian region have addressed the problem of ensuring availability of basic food products primarily through domestic production. In 2020, self-sufficiency for most products exceeded the threshold of 80–95% established in the countries of the region for the concept of food independence.

↓ Table 1. Self-Sufficiency Levels* for Basic Agricultural Products in the Eurasian Region, 2021 (%)

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia	Tajikistan	Uzbekistan	Eurasian region
Grain	20	90	125	62	150	61	73	132
Potatoes	101	100	104	99	88	96	88	92
Vegetables, melons, and gourds	102	103	108	96	87	102	129	103
Fruit and berries	103	57	38	111	44	96	122	65
Meat of all types	61	134	82	87	101	92	96	100
Milk and dairy products	83	263	93	110	84	99	99	97
Eggs	100	128	100	90	98	98	100	99
Sugar	12	141	8	68	100	0	0	84
Vegetable oils	1	220	91	11	117	24	44	151

Note: * the ratio of physical volumes of domestic production to physical volumes of domestic consumption.

Source: EDB estimates based on data from national statistical offices, FAO, and the Interstate Statistical Committee of the CIS.

In the Eurasian region, the overall levels of self-sufficiency in 2021 were estimated to be:

- 151% for vegetable oils;
- 132% for grain;
- 103% for vegetables, melons and gourds;
- 100% for meat;
- 99% for vegetable oils;
- 99% for eggs;
- 97% for milk and milk processing products;
- 92% for potatoes; and
- 84% for beet sugar.

The only noteworthy thing here is the rather low level of self-sufficiency on the fruit and berry market — 65%. Even considering that a significant part of the consumption of these products is covered by imports (tropical fruits and berries, for which the natural and climatic conditions do not exist for large-scale production), the share of the countries of the Eurasian region may sharply increase in this segment of the food market.

At the country level, self-sufficiency was inadequate only for the following products:

- Armenia: grain, meat of all kinds, sugar, vegetable oils;
- Belarus: fruit and berries;
- Kazakhstan: sugar, fruit and berries;
- Kyrgyzstan: vegetable oils, grain, sugar;
- Russia: dairy products, fruit and berries, vegetables, potatoes;
- Tajikistan: sugar, vegetable oils, grain; and
- Uzbekistan: sugar, vegetable oils, grain.

The great disparity of self-sufficiency in certain products among the countries of the Eurasian region is quite natural[7], a result of different levels of economic development, natural and climatic conditions, and cultural traditions.

According to the FAO, average diets are generally sufficient in terms of their energy value in all countries of the Eurasian region, except for Kyrgyzstan and Tajikistan: at present, the indicators exceed 2,800 kcal per day (corresponding to the upper boundary of food well-being, which minimises the risks of hunger, although the diet is insufficient) and are comparable to those of developed countries (over 3,000 kcal per day).

Nevertheless, all the countries still have unbalanced diets in terms of basic nutrients, with cheaper plant-based products prevailing. For some types of food, per capita consumption remains below the standards adopted in the countries of the Eurasian region, in particular:

- Armenia: dairy and fish products, potatoes;
- Belarus: dairy and fish products, eggs, potatoes;
- Kazakhstan: dairy and meat products, eggs, fruit and berries, vegetables, bread products;
- Kyrgyzstan: meat and fish products, eggs, vegetable oil;
- Russia: dairy and fish products, fruit, vegetables, potatoes; and
- Tajikistan: dairy and meat products, fruit and berries, potatoes, vegetable oil.

However, the actual per capita consumption of some products — primarily sugar, bread products, and vegetables — significantly exceeds the established rational standards in a number of countries.

[7] The target of achieving full or close to full (80–95%) self-sufficiency across the entire range of food products seems less natural. However, in some countries of the Eurasian region, in particular in Russia, the concept of food independence (within the Food Security Doctrine) implies exactly that — as the agro-industrial complex develops, self-sufficiency thresholds rise and are set for an expanding range of products. At present in Russia, that includes almost all basic food products, as well as seeds.

↓ **Table 2. Actual and Normative Indicators of Per Capita Consumption of Basic Food Products in the Eurasian Region, 2021, kg per Person per Year**

	RA	RB	RK	KR*	RF	RT	RUz**
Bread and other processed grain products	157.1 (130)	76.0 (105)	99.2 (109)	156.4 (115/89)	116.0 (96)	165.8 (145)	186.2 (–)
Potatoes	60.6 (91)	156.5 (170)	107.4 (100)	99.7 (99/57)	84.5 (90)	42.9 (91)	96.0 (–)
Vegetables, melons and gourds	170.6 (110)	150.8 (124)	230.6 (149)	159.4 (114/150)	106.1 (140)	227.3 (164)	276.7 (–)
Fruit and berries	92.5 (73)	93.3 (78)	48.7 (132)	26.2 (124/112)	64.6 (100)	71.8 (122.4)	102.5 (–)
Meat and meat products (in meat equivalent)	59.6 (37)	97 (80)	78.7 (78.4)	40.1 (61/39)	76.8 (73)	18.6 (41)	48.2 (–)
Fish and fish products***	4.4 (11.0)	12.5 (18.2)	15.1 (14.0)	1.4 (9.1/7.7)	20.2 (22.0)	н/д (8.4)	3.0 (–)
Dairy products (in milk equivalent)	245.1 (312)	233.4 (393)	247.0 (301)	204.8 (200/185)	241.9 (325)	81.1 (114)	303.0 (–)
Eggs (units per year)	229.6 (183)	261.9 (294)	228.7 (265)	91.3 (183/166)	283.4 (260)	77.1 (180)	200.2 (–)
Sugar	24.9 (18.0)	39.9 (33.0)	26.5 (17.0)	11.1 (26/22)	40.4 (8.0)	16.7 (19.2)	19.3 (–)
Vegetable oil	10.5 (7.3)	17.8 (13.2)	21.1 (12.0)	7.5 (9.1/9.6)	14.0 (12.0)	15.9 (16.6)	10 (–)

Notes: * For Kyrgyzstan, the average physiological standards and the minimum consumption standards are given in parenthesis (with a slash); for other countries of the Eurasian region, actual and (in parenthesis) normative indicators are given;

** For Uzbekistan, the actual indicators of per capita consumption of fish and fish products are presented for 2017; rational consumption standards are determined not in terms of certain food products but in terms of calories, proteins, fats, and carbohydrates (Ministry of Health of the Republic of Uzbekistan, 2017).

*** for 2020.

Source: EDB based on data from government agencies.

Food Security in the Eurasian Region in Terms of Food Accessibility

For food affordability, the situation is less favourable. The share of expenditures on food in total household consumer expenditures in the EAEU countries exceeds 30%, even though actual consumption of certain types of food is below the established rational standards.

According to the Institute of Economic Forecasting of the Russian Academy of Sciences (IEF RAS) (Polzikov, 2020), in 2018, the share of households with consumer expenditures below the level corresponding to the cost of the food basket based on rational standards was 45–50% in Russia, 40–45% in Belarus, 65–70% in Armenia, 70–75% in Kazakhstan and Kyrgyzstan, with lower national standards of rational consumption in Armenia and Kyrgyzstan. This indicates the low purchasing power of household disposable incomes and the insufficient affordability of an adequate quantity and assortment of food products.

The modality of social and economic development and the corresponding growth and differentiation of real household incomes play a vital role in ensuring the affordability of food. This explains why food security policy has a general economic nature rather than a sectoral one.

High Dependence on Imports of Investment and Intermediate Goods

Despite high levels of self-sufficiency in key agri-food products, significant volumes of high-tech capital goods for crop production and animal husbandry are currently imported to the Eurasian region.

For instance, in 2021, the EAEU imported materials and equipment worth USD 6.1 billion, which is 1.5 times more than in 2015. Of that amount, purchases for crop production totalled USD 3.8 billion (61%), having increased by a factor of 1.8 during the period under review. Agricultural machinery accounted for the largest share (46%) of imported capital goods for crop production — USD 1.7 billion, mainly grain combine harvesters.

In Belarus, there were four grain combine harvesters per 1,000 ha of crops in 2020, and there were only two in Russia. The available power per hectare of arable land in Russia is estimated at 1.5 hp, which is 3–5 times lower than in Europe and North America. Imports of pesticides and agricultural seeds were comparable — 26% and 24%, respectively, worth about USD 1 billion. Fertilizers accounted for 5% of the cost of imported inputs for crop production. The highest foreign exchange expenditures on agricultural seeds in the Union were for sunflower seeds — USD 268.2 million in 2021, corn and vegetables — USD 157.9 million each, and sugar beets — USD 124.1 million.

Sunflower seeds accounted for the largest share of import growth: in 2021, compared to 2015, the volume of imports increased by a factor of 1.6, from 17.7 million tonnes to 27.9 million tonnes. The share of imports in the total volume of seeds of this oilseed crop is estimated at 61% in the EAEU, and 69% in Russia. Kazakhstan is completely dependent on imported sunflower seeds.

Taking into account the average seeding rate and oil yield from sunflower seeds, about a quarter of sunflower oil produced in the EAEU is made from imported seeds. Another crop with a high rate of dependence on seeds is sugar beets. A significant share of imports is observed in Kazakhstan and Russia — 90% and 94%, respectively, while in Belarus it is 73%, in Kyrgyzstan 63%, based on which the estimate for the Union is 91%. Therefore, the achievement of full self-sufficiency in sunflower oil and sugar produced from sugar beets grown within the Union is quite conditional if the import component is removed from the production chain.

Armenia is completely dependent on imports of corn and pea seeds, Belarus on imports of rapeseed seeds, Kazakhstan on sorghum, while for corn, imports cover 67% of the country's needs.

The situation is similar in animal husbandry. In 2021, materials and equipment worth USD 2,359.2 million were imported to ensure sustainable functioning of the industry. Feed accounted for more than half of imports by volume, or 52%; the EAEU countries imported feed worth USD 1.2 billion.

Breeding material — a vital component of the quality and competitiveness of livestock products — constituted 26% of imports, or USD 609 million. In particular, in 2021, imports of chicken eggs for incubation and pure-bred breeding cattle amounted to USD 395 million.

At present, in an effort to maximise their productivity and profitability, many producers are switching to the use of imported hybrid and global breeds, losing their original strains and traditionally bred farm animals and poultry, which are adapted to local conditions and have unique features.

An unfortunate example of that in the countries of the Eurasian region could be poultry farming, where the entire grandparent herd of chickens is imported from third countries. This leads to total dependence on imports and jeopardises the achievement of self-sufficiency in poultry meat in the region.

Agricultural producers of the member states generate high demand for veterinary drugs, as well as equipment for animal husbandry, in particular forage and fodder harvesting complexes. They accounted, respectively, for 10% (USD 232 million) and 13% (USD 298 million) of imports of materials and equipment for the sub-sector in the EAEU.

Given the heavy dependence of agriculture in the Eurasian region on imported foreign inputs and equipment, the sanctions imposed by Western countries against the Russian Federation and Belarus create a risk of deteriorating food security in the short term in the Eurasian region as a whole.

2. PRODUCTION AND RESOURCE POTENTIAL OF THE AGRO-INDUSTRIAL COMPLEX IN THE EURASIAN REGION

2.1. Importance of the Eurasian Region for Global Food Security

The agro-industrial complex is of strategic importance for the social and economic development of the Eurasian region and for global food security. Agriculture, excluding the food industry, generates a substantial share of gross value added in all countries of the region — ranging from 4% of GDP in Russia to 23% of GDP in Uzbekistan — and is an important source of income for a significant part of the population. In 2018, about 74 million out of 224 million people lived in rural areas in the Eurasian region — or 33% of the region's population on average, ranging from 21.4% in Belarus to 73.0% in Tajikistan.

Table 3. Key Characteristics of the Agro-Industrial Complex in the Eurasian Region*

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia	Tajikistan	Uzbekistan	Eurasian region
Arable land (2020)	0.03	0.37	1.9	0.09	7.9	0.07	0.28	10.64
Permanent pastures and hayfields (2020)	0.04	0.08	5.79	0.28	2.89	0.12	0.67	9.87
Gross value of agricultural output (2020)	0.04	0.30	0.44	0.09	2.51	0.10	0.59	4.06
Exports of the agro-industrial complex (2021)	0.05	0.34	0.16	0.02	1.68	0.00	0.08	2.33
Imports of the agro-industrial complex (2021)	0.05	0.24	0.26	0.05	1.75	0.05	0.17	2.40
Population (2018)	0.04	0.12	0.24	0.08	1.91	0.12	0.43	2.94

Note: * data as at 31 August 2022. For export and import, estimates were made for FEACN product chapters 01–24.

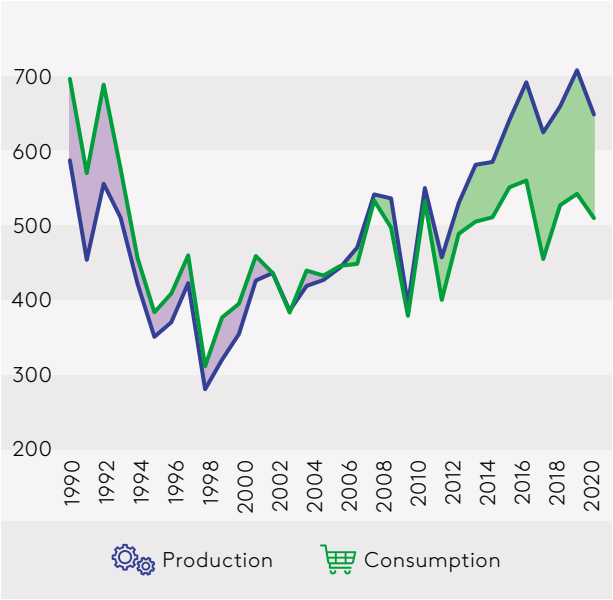
Source: FAO, Trademap, EDB calculations.

The development of the agro-industrial complex (see Figure 4), its participation in international trade, and strengthening of integration processes have contributed to addressing the issue of food security in the Eurasian region and facilitated its transformation since 2007 into a net exporter of basic food products, in terms of food balance indicators by energy value (see Figure 5). In 2021, food production was more than 2.3 times higher than in 1998 — the point of the lowest food output in the Eurasian region following the collapse of the USSR — and amounted to 643 trillion kcal. In monetary terms, food production increased by a factor of 1.9 during the same period, reaching USD 146.7 billion at constant 2020 prices.

Trends in the development of the agri-food market in the Eurasian region are determined to a large extent by shifts in food production and consumption in Russia. In 2021, Russia accounted for 75.1% of food production in the region in terms of energy value. By comparison, Kazakhstan accounted for 9.5%, Uzbekistan for 6.6%, and Belarus for 6.2%. Taken together, Tajikistan, Kyrgyzstan, and Armenia accounted for only 2.6% of output.

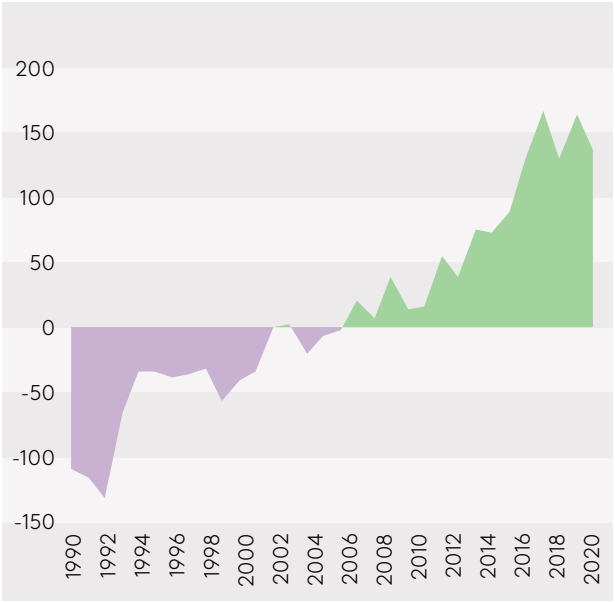
Russia produces 78% of the region's cereal and leguminous crops; 82.1% of oilseeds; 90% of sugar beets; 71% of meat of all kinds; 71.2% of eggs; 85.3% of vegetable oil; and 88.2% of sugar. Over the past decade, the following trends have emerged in the Russian market: an increase in the production and export of grain and vegetable oils; active import substitution in the meat and sugar markets; a minor decline in the production and consumption of milk and potatoes; an increase in the consumption of vegetables and eggs (through the development of domestic production), as well as fruit (through greater import volumes) (Ksenofontov, Polzikov, Urus, 2020).

↓ **Figure 4. Food Production and Consumption in the Eurasian Region (kcal trillions)**



Source: EDB calculations.

↓ **Figure 5. Net Food Exports in the Eurasian Region (kcal trillions)**



Source: EDB calculations.

Significant progress in food production was also recorded in Belarus (for all basic products other than potatoes, eggs, and sugar), Kazakhstan (for all basic food products other than sugar). Both Belarus and Kazakhstan, as well as Russia, are net exporters in terms of energy value and actively participate in international trade. The share of Belarus is relatively high in the production of potatoes (14.5%), milk (12.8%), sugar (7.9%), and meat of all types (7.8%). Kazakhstan's share is high in the production of vegetables, including melons and gourds (17.5%), potatoes (12.2%), grain (10.5%), oilseeds (9.1%), milk (10.2%), meat of all types (7.7%), and eggs (7.7%).

Uzbekistan has achieved an increase in food production, but given its high population growth rates, this remains insufficient to meet domestic needs. Therefore, the country's net imports in terms of energy value have increased significantly. However, Uzbekistan's share in the Eurasian food market is significant in the production of fruit and berries (38.4%), as well as vegetables, including melons and gourds (30.5%), and is relatively high in all types of meat (10.4%) and potatoes (9.9%).

Despite progress in achieving food security, Armenia, Kyrgyzstan, and Tajikistan are net importers of food products.

The key trend that has contributed to the formation of a favourable balance in the Eurasian region from the standpoint of food security is the development of cereal crops, which is vital for regional and global food security. Wheat, for example, is one of essential staples and is a component of a large number of foodstuffs. Seventy percent of direct wheat consumption is related to food, and global wheat consumption is constantly growing.

↓ **Table 4. Production and Domestic Consumption (in parentheses) of Basic Agri-Food Products in Countries of the Eurasian Region, 2021 (tonnes millions)**

Product	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Grain	0.15 (0.79)	7.42 (8.27)	16.38 (13.15)	1.33 (2.13)	133.47 (80.94)	1.55 (2.54)	7.64 (10.53)	**155.78 (118.33)**
Potatoes	0.36 (0.36)	4.81 (4.81)	4.03 (3.86)	1.33 (1.30)	19.61 (20.69)	1.02 (1.07)	3.29 (3.71)	**33.10 (35.80)**
Vegetables, melons and gourds	0.75 (0.73)	1.71 (1.66)	7.55 (6.99)	1.34 (1.39)	15.38 (17.69)	3.24 (3.18)	13.14 (10.15)	**43.09 (41.79)**
Fruit and berries	0.56 (0.54)	0.62 (1.09)	0.38 (1.01)	0.27 (0.25)	4.74 (10.86)	0.71 (0.74)	4.55 (3.74)	**11.83 (18.24)**
Meat of all types	0.11 (0.18)	1.25 (0.93)	1.23 (1.51)	0.24 (0.27)	11.35 (11.25)	0.17 (0.18)	1.66 (1.72)	**16.00 (16.04)**
Raw milk	0.67 (0.81)	7.82 (2.97)	6.25 (6.69)	1.70 (1.55)	32.29 (38.35)	1.04 (1.05)	11.27 (11.41)	**61.04 (62.83)**
Eggs (billion units)	0.70 (0.75)	3.53 (2.76)	4.84 (4.82)	0.56 (0.63)	44.89 (46.04)	0.75 (0.76)	7.79 (7.81)	**63.06 (63.52)**
Sugar	0.03 (0.08)	0.53 (0.36)	0.15 (0.50)	0.05 (0.08)	5.90 (5.80)	0.02 (0.18)	0.02 (0.68)	**6.69 (7.68)**
Vegetable oils	0.00 (0.08)	0.49 (0.38)	0.36 (0.50)	0.01 (0.08)	6.58 (5.90)	0.04 (0.16)	0.23 (0.68)	**7.71 (7.78)**

Source: EDB estimates based on data from national statistical offices, FAO, and the Interstate Statistical Committee of the CIS.

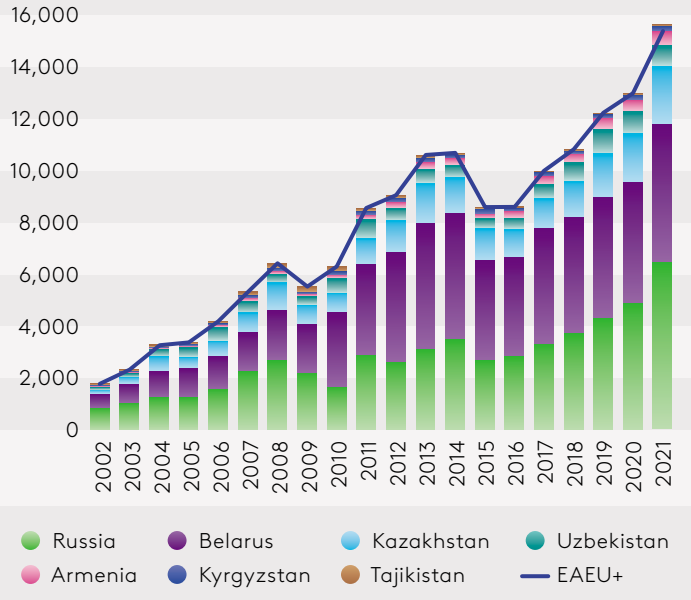
The measures taken and the international market conditions facilitated the achievement of grain production volumes well beyond the region's own needs — in 2021, 155.8 million tonnes against consumption of 118.3 million tonnes — and thus contributed to export expansion. As a result, Russia and Kazakhstan ranked among the world's 10 leaders in grain production and export. For many other categories of food products, the situation was less clear at end-2021. For some items, the region has a slight surplus of production over consumption (vegetables, melons and gourds), balanced production and consumption (meat of all types; eggs; vegetable oils), or relies on imports (potatoes; fruit and berries; raw milk).

An analysis of the balance of food production, consumption, and foreign trade flows in the Eurasian region also indicates that there is production specialisation of the region's economies, partly due to natural and climatic factors, as well as unmet needs of many countries in certain product categories. Therefore, cooperation among the countries of the Eurasian region is necessary to address the issue of food security.

Mutual trade between the countries of the Eurasian region is growing steadily and reached USD 15.4 billion in 2021 (see Figure 6). The share of mutual exports in total exports of agro-industrial goods amounted to 33.6% in 2021. Over the past 20 years, the volume of mutual exports of agro-industrial goods has increased by a factor of 8.5. Since 2015, when the EAEU became operational, mutual trade in agro-industrial goods between the countries of the Eurasian region has increased by a factor of 1.8. In 2015–2021, the highest rates of growth of exports to the regional market were in Armenia (3.1 times), Russia (2.3 times), and Uzbekistan (2.1 times).

Most exports of agro-industrial goods to the region's market come from Russia, Belarus, and Kazakhstan, whose combined share in mutual exports amounted to 90% (see Figure 7). Those countries are key producers of food and will be guarantors of food security for the entire region in future. The composition of mutual imports is different. The major importers on the Eurasian market are Russia (40.2%) and Kazakhstan (21.9%). Russia, Kazakhstan, and Belarus account for a significantly smaller volume of mutual imports — 72.4%. Uzbekistan is also a major importer (13.4%).

↓ Figure 6. Mutual Exports of Agro-Industrial Goods in the Eurasian Region (USD millions)



↓ Figure 7. Share of Countries of the Eurasian Region in Mutual Trade in Agro-Industrial Goods, 2021 (%)

	Export	Import
Russia	41.3	40.2
Belarus	34.2	12.4
Kazakhstan	14.4	21.9
Uzbekistan	5.0	13.4
Armenia	3.3	2.6
Kyrgyzstan	1.5	4.4
Tajikistan	0.2	5.2

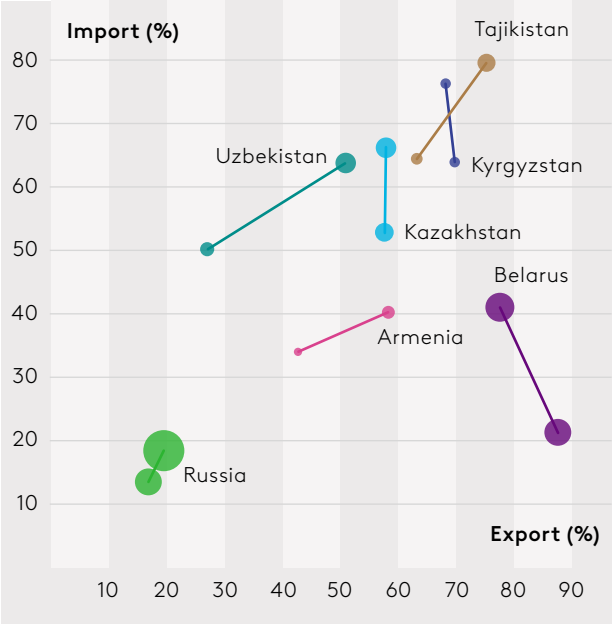
Source: EDB calculations based on data from Trade Map, the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan.

More than a third of mutual trade in agro-industrial goods is in three commodity groups: dairy products, eggs, honey (17.9%); cereals (9.4%); and fats and oils (9.2%). The main supplier of dairy products to the regional market is Belarus (85.9% of mutual exports), that of cereals is Kazakhstan (67.7%), and that of fats and oils is Russia (70.7%). Exports of the following commodity groups are most evenly distributed between countries: vegetables, fruit and nuts, animal products, fish, and drinks.

The Eurasian market is most important for exports of agro-industrial goods from Belarus (share in total exports of 78.8% in 2021), Tajikistan (76.2%), and Kyrgyzstan (69.1%). Imports of agro-industrial goods from countries of the region are most important for Tajikistan (share in total imports 79.6%), Kyrgyzstan (76.1%), Kazakhstan (66.4%), and Uzbekistan (63.8%) (see Figure 8). The highest rates of growth of imports from the Eurasian countries were in Uzbekistan (2.4 times) and Belarus (2 times).

Russia has the largest turnover of agro-industrial goods in the region and is the main supplier and importer for most Eurasian countries. The share of Kazakhstan in Russia's exports of agro-industrial goods was 43.2% in 2021, that of Belarus 28.4%, and that of Uzbekistan 12.6%. Russia is the main supplier of agro-industrial goods for Belarus (97.6%), Armenia (93.6%), Kazakhstan (81.6%), and Kyrgyzstan (52.4%). Uzbekistan and Tajikistan import agro-industrial goods mainly from Kazakhstan (53.7% and 51.7%, respectively) (see Figure 9).

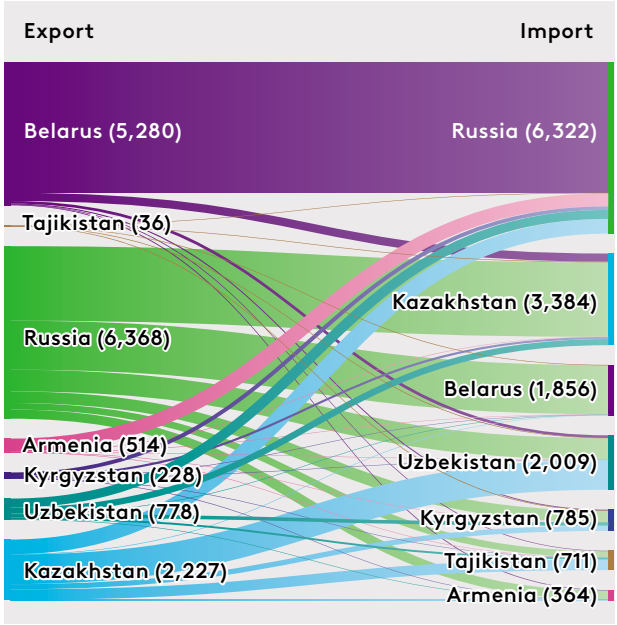
↓ Figure 8. Change in Shares of Mutual Trade in Agro-Industrial Goods in Countries of the Eurasian Region in Total Trade in Agro-Industrial Goods, 2015–2021 (%)



Note: The size of a circle corresponds to the relative volume of trade in agro-industrial goods with the EAEU countries, Tajikistan, and Uzbekistan.

Source: calculations of EDB analysts based on data from Trade Map, the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan.

↓ Figure 9. Exports and Imports of Agro-Industrial Goods in Countries of the Eurasian Region, 2021 (USD millions)



Source: calculations of EDB analysts based on data from Trade Map, the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan.

Over 30 years, the Eurasian region has overcome difficulties in ensuring its food security (including through increasing mutual trade), and has expanded the output of basic food products, strengthening its importance in the international food market. However, the share of the region in global exports of agro-industrial products (USD 45.3 billion in 2021) is currently only 2.3%. According to the International Trade Centre (ITC), the untapped export potential of the region's agro-industrial complex is estimated at USD 16 billion. The largest untapped food export potential is for Tajikistan (67.5%), Armenia (57.1%), and Uzbekistan (56.9%). It is 47.5% for Russia, 44.1% for Kyrgyzstan, 41.2% for Kazakhstan, and is the lowest for Belarus — 29.9%. The average for the region is 45.4%.

The Eurasian region has some of the greatest natural resource potential in the world:

- The region is home to 10.1% of the world's agricultural land — 10.6% of its arable land and 9.9% of its permanent pastures and hayfields. Moreover, significant amounts of land have been withdrawn from circulation since 1990, and the rate of utilisation of arable land is one of the lowest in the world.

- Low crop yields and livestock productivity are indicative of significant prospects for technological progress.

- Climate change models show that the impact on the agro-industrial complex in the Eurasian region will be more favourable than in other geographical zones, owing to improved conditions for water supply and temperature conditions.

With the significant natural resource potential of its agro-industrial complex, the Eurasian region is characterised by moderate expectations as to the growth of domestic consumption in the long term given its mixed demographic trends and the fact that the population's diet is already sufficient in energy value. It is also important that agriculture has historically been one of the basic elements of the region's economic specialisation. Food has always been the main domestic and export product. The region already has a culturally and historically shaped and well-established ecosystem of production factors, socio-economic links, and other basic elements vital for the functioning of the agro-industrial complex. That combination of factors indicates that there is a significant export potential that could be tapped to ensure the region's global food security.

2.2. Methodology for Assessing Production, Resource, and Export Potential

We have used the conventional balance approach to assess the state and prospects of food security and perform scenario-based modelling of the production and export potential of the EAEU countries, Uzbekistan, and Tajikistan. Following that approach, scenario-based projected balances are prepared for domestic production of basic food products and imports of agri-food products. The dynamics of domestic consumption for food and production purposes are simulated separately, ultimately generating scenario-based estimates of exports obtained by calculating the difference between the corresponding indicators of production, imports, and consumption under different scenarios.

From the point of view of methodology, the supply and use balance of product *i* in country *j* can be presented as:

$$Z^0_{ij} + Prod_{ij} + Imp_{ij} = Cons_{ij} + O_{ij} + Exp_{ij} + Loss_{ij} + Z^1_{ij}, \qquad (1)$$

where

$Prod_{ij}$ is the domestic production of product *i* in country *j*;

Z^0_{ij} — is the stock of product *i* at the beginning of the year in country *j*;

Z^1_{ij} is the stock of product *i* at the end of the year in country *j*;

Imp_{ij} is the imports of product *i* to country *j*;

Exp_{ij} is the exports of product *i* from country *j*;

$Cons_{ij}$ is the private consumption of product *i* in country *j*;

O_{ij} is other uses of product *i* in country *j* (for example, the use of grain for feed in animal husbandry, for seed stock, for processing for food and non-food needs); and

$Loss_{ij}$ is the losses of product *i* in country *j* in production, processing, and circulation.

At the **first stage**, based on data from national statistical offices, the Statistical Committee of the CIS, and FAOSTAT, historical national supply and use balances were prepared for the following product groups critical for ensuring food security and realising the export potential: 1) grain; 2) potatoes; 3) vegetables, melons and gourds; 4) fruit and berries (including grapes); 5) meat and meat products; 6) milk and dairy products; 7) eggs; 8) sugar; and 9) vegetable oils.

These product groups were selected based on the food consumption standards approved in the countries under consideration, as well as on the availability of comprehensive statistical information on relevant food products. According to FAO estimates (Table 5), the selected set of food products covers between 92% and 99% of the total energy value of the diet in the countries under consideration. The unaccounted energy value fell more into the category of non-alcoholic and alcoholic beverages, which can be ignored in the context of food security.

↓ **Table 5. Energy Value of the Diet, kcal per Person per Day, 2019**

	RA	RB	RK	KR	RF	RT	RUz
1. Bread and processed grain products	1,025	930	1,086	1,281	1,239	1,330	1,482
2. Potatoes	44	323	204	171	164	69	157
3. Vegetables, melons and gourds	147	121	148	147	89	171	191
4. Fruit and berries	158	123	98	139	92	72	170
5. Meat and meat products	529	484	385	229	421	216	261
6. Dairy products	390	279	498	341	341	156	466
7. Eggs	45	51	32	18	63	8	20
8. Sugar and sweeteners	350	311	248	165	396	183	195
9. Oilseeds, oils and vegetable fats	246	413	484	151	341	257	234
10. Fish and seafood	20	27	10	4	46	3	6
11. Other (alcohol, drinks, spices)	65	229	139	78	167	17	37
Total	**3,019**	**3,291**	**3,332**	**2,724**	**3,359**	**2,482**	**3,219**
Total, except for items 10 and 11, % of total consumption	*97%*	*92%*	*96%*	*97%*	*94%*	*99%*	*99%*

Source: FAOSTAT database of the UN Food and Agriculture Organisation.

The **second stage** entailed scenario-based modelling of the production and resource potential of the Eurasian region based on assumptions regarding future dynamics of key agricultural production indicators.

Crop production forecasts were based on estimates of future sown area and yields of various crops. The pattern of increasing land productivity will be determined by the pace of technical and technological modernisation of crop production and its intensification, especially the increased use of mineral fertilizers. A separate simulation was run for Russia to model that relationship, based on data for selected crops and constituent entities of the Russian Federation on average for 2016–2021.

Then, for those countries of the Eurasian region for which historical data on specific volumes of mineral fertilizer application for various crops were available (per 1 ha of sown area), the yield was calculated as the sum of average yields over the past five years and yield gains. The yield gains, in turn, would be the product of the projected growth of mineral fertilizer application for a selected crop — in accordance with the forecast of mineral fertilizer application estimated through extrapolation — and the coefficient of crop yield elasticity with respect to mineral fertilizer application. The elasticity coefficients were determined based on the linear regression equations obtained earlier, describing the dependence of the yield of a selected crop on mineral fertilizer application. For Russia and Belarus, an additional reduction factor of 0.5 was used to take into account difficulties in technology imports. In addition, for the Russian Federation, the projected yields of cereal crops were also adjusted in accordance with estimates of their climate-related changes in certain macroregions (for the RCP8.5 scenario) available in the literature (Pavlova, 2021; Pavlova et al., 2019).

Box 3. Correlation between Mineral Fertilizer Application per Hectare of Crops and Yields of Basic Crops in the Russian Federation, in Agricultural Organisations, Average for 2017–2021

The following regression equations were derived, describing the correlation between mineral fertilizer application rates and the yields of cereal crops, as well as their characteristics — R^2, F-statistics, and t-statistics (in parenthesis below regression coefficients).

$$Yield_{wheat} = \underset{(14.23)}{13.30} + \underset{(20.06)}{0.2347} \times Fertilizer\_use \qquad R^2 = 0.90;\ F = 402$$

$$Yield_{barley} = \underset{(11.26)}{12.52} + \underset{(14.88)}{0.2033} \times Fertilizer\_use \qquad R^2 = 0.83;\ F = 221$$

$$Yield_{corn} = \underset{(8.20)}{32.62} + \underset{(4.95)}{0.2034} \times Fertilizer\_use \qquad R^2 = 0.43;\ F = 25$$

In addition, similar regression equations derived for other crops also demonstrate a positive correlation between mineral fertilizer application rates and yields:

$$Yield_{\text{sunflowers}} = \underset{(11.25)}{10.02} + \underset{(10.33)}{0.1524} \times Fertilizer\_use \qquad R^2 = 0.82;\ F = 107$$

$$Yield_{\text{sugar beets}} = \underset{(6.85)}{270.54} + \underset{(3.53)}{0.4502} \times Fertilizer\_use \qquad R^2 = 0.41;\ F = 12$$

$$Yield_{\text{potatoes}} = \underset{(8.93)}{117.24} + \underset{(9.34)}{0.3651} \times Fertilizer\_use \qquad R^2 = 0.56;\ F = 88$$

$$Yield_{\text{vegetables}} = \underset{(5.35)}{131.20} + \underset{(6.83)}{0.6561} \times Fertilizer\_use \qquad R^2 = 0.42;\ F = 47$$

For those countries of the Eurasian region for which there are no historical data available on the specific volumes of mineral fertilizer application for individual crops, the yields of basic crops were determined directly by extrapolating past trends.

For Central Asian countries, another essential factor of crop production intensification is the expansion of irrigated areas. But in the absence of detailed statistics on the current state and efficiency of irrigation systems in the countries under consideration, the effect of this factor was not directly incorporated in our scenario-based projections.

The prospects for the production of livestock products were estimated in different ways, depending on the scenario, either by extrapolating past trends observed in 2016–2021 or by taking into account the targeted output levels approved in national plans of agro-industrial development, as well as the current restrictions.

Production projections were adjusted after the pattern of food consumption in the region was estimated (iteration after the third stage), as there is a correlation between the development of domestic agri-food production and growth in demand for those products. The greater the opportunities for selling agricultural products in domestic and foreign markets, the greater the intensification of agricultural production and the increase in production volumes. Moreover, in agro-industrial sectors such as dairy and meat farming, production of eggs, sugar or vegetable oils, demand constraints are more significant than resource ones. For example, relying on its domestic feed base, Russia could produce meat products in volumes significantly higher than it does now. But in conditions of weak effective domestic demand and limited access to foreign markets, meat production in greater volumes finds no demand, so large quantities of grain and meal are exported, rather than meat products.

It should be noted that the potential impact of difficult-to-predict factors — extreme weather, disruptions in the supply of critical resources for current industrial use — that may cause significant volatility of agricultural output was not taken into account in the modelling.

At the **third stage**, we made scenario-based forecasts of domestic food consumption in the Eurasian region. To design scenarios for changes in domestic consumption of agro-industrial products, we first constructed consumer demand models. The models enable estimation of future per capita consumption of basic food products, depending on a given pattern of real household incomes, as well as physical volumes of domestic production and — for selected food groups and countries of the Eurasian region — imports and exports of agro-industrial products.

Consumer demand functions were used to forecast per capita food consumption. Those functions may take different forms, but in this paper, we used log-linear dependencies of per capita consumption on real household income indices and on per capita volumes of domestic production of relevant products.

The forecasting models are based on the following equation (formula 3):

$$Log\ (Cons_{ij}) = a_i \cdot Log\left(\frac{Inc_j}{Inc_{2021}}\right) + b_i \cdot Log\left(\frac{Inc_j}{Inc_{2021}}\right) + \varepsilon_i, \qquad (3)$$

where

Log (...) is the decadic logarithm;

$Cons_{ij}$ is per capita consumption of group *i* products in year *j*;

Inc_j is per capita household income at constant prices in year *j*;

$Prod_{ij}$ is physical volumes of per capita production of products of food group *i* in year *j*;

a_i, b_i are the coefficients of elasticity of per capita consumption of group *i* products with respect to variables *Inc* and *Prod*; and

ε_i is a constant term corresponding to group *i*.

The choice of such functions for forecasting food demand is substantiated in experts' papers (Suvorov, Solovyov, 2011; Potapenko, Shirov, 2021). The selected explanatory variables allow for a fairly simple interpretation of the dependence of the forecast value. The growth of household incomes determines an increase in consumer spending, including expenditure on food, while the expansion of domestic production ensures greater supply of food for the domestic market and improved access of the population to them.

Data on per capita food consumption, per capita incomes (or real income indices), population, and domestic production of basic food products are published by national statistical offices. Coefficients a_i, b_i, and ε_i are determined for all countries of the Eurasian region and for all food groups, using the method of least squares based on historical data. This paper covers the period of 2006–2021, which is explained by the availability of statistical data for those years for all countries under consideration.

It is important to note that the demand models presented here are quite simple, as they do not explicitly take into account the effects of complements and substitutes (that is, the projected consumption of products of each food group is simulated independently of the consumption of other food products). However, these effects are taken into account indirectly, through the values of the coefficients for explanatory variables. For example, the coefficients of elasticity of demand for potatoes and grain products with respect to real household incomes (a_i) are negative for most countries in the region, which is explained by replacement of those products with more expensive ones, such as meat or fruit, as the prosperity of the population improves.

The transition to forecasting per capita consumption involves putting forecast values of explanatory variables for each development scenario into the derived regression models.

With regard to population trends for Russia, the parameters of the medium scenario of the demographic forecast until 2035 prepared by the Federal State Statistics Service of the Russian Federation (Rosstat) were used, namely, population growth compared to the previous year (Federal State Statistics Service of the Russian Federation, 2022). For other countries in

the Eurasian region, the parameters of the UN 2022 World Population Prospects (UN, 2022) were used. As with the Russian Federation, relevant population growth values were added to the 2021 baseline population values for the other countries.

The projected trend of real household incomes in the Russian Federation is based on the parameters of the inertial scenario for the medium-term (until 2025) and long-term (until 2036) forecasts of social and economic development prepared by the Ministry of Economic Development of the Russian Federation[8]. Due to the lack of similar forecasts for other countries in the Eurasian region, changes in per capita GDP were used as an approximation of the real household income index. For this purpose, we used the parameters of the medium-term forecast of real GDP growth (for 2022–2024) published by the World Bank (World Bank, 2022b), adjusting them to the projected population trend in the respective countries. For 2025–2035, the hypothesis of inertial development was used, extrapolating the trends of the retrospective period and of 2022–2024.

For those models where imports are used as one of the components of the explanatory variable to derive regression equations, import forecast values were set either based on the inertial logic, by extrapolating the share of imports in domestic consumption under the inertial scenario, or based on normative logic, by using a fixed decrease in the share of imports in domestic consumption under the targeted scenario. Balance ratios were taken into account in such a way as to ensure no negative values for key balance variables, primarily exports. Similarly, with regard to exports, for those models where exports are one of the components of the explanatory variable, we used hypotheses of inertial development (in the inertial scenario) or changes in it in accordance with some targets and constraints on sales markets (in the targeted scenario). The values of balancing variables — animal feed consumption, losses, etc. — were checked to prevent negative values. It was the variation in per capita production, imports, and exports, that determined the differences between the inertial and targeted scenarios.

Analysis of the approximation parameters within the framework of the derived models of consumer demand shows that the proposed specifications ensure a fairly high regression quality. For most equations, the coefficient of determination (R2) exceeds 0.7–0.8, and the mean absolute percentage error (MAPE) is below 3–5% (see Annex 11).

In addition to the consumption of agricultural products for food, a significant part of domestic demand is formed by consumption for production purposes — for feed, seeds, and non-food processing. The dynamics of demand for production purposes is determined by the efficiency of agricultural production and its physical volumes.

At the **fourth stage,** the resource potential of the Eurasian region's exports is calculated directly. The estimation is based on balance logic and estimates of future volumes of domestic production and imports of agri-food products, made at earlier stages of the analysis, less domestic consumption for food and production purposes[9]. The results obtained for net exports in physical volumes, energy, and value, ultimately support calculations of the number of people that the agro-industrial complex of the Eurasian region is able to feed, and through additional estimates of the potential of foreign markets, enable the identification of the main export destinations.

[8] The trend projected for real household incomes was applied to incomes of all decile groups (that is, it was unchanged for all income groups). In other words, neither the inertial and nor the targeted scenario included structural shifts reflecting changes in income differentiation of households. Social and economic development forecasts of the Ministry of Economic Development of the Russian Federation are available at Ministry of Economic Development of the Russian Federation, 2021.

[9] As to imports, under the inertial scenario, it is assumed that the past trends of their share in domestic consumption would remain unchanged, and the targeted scenario assumes that the share would decline in alignment with the rates of food self-sufficiency.

In addition, calculations were made to estimate the social and economic effects of the realisation of the resource potential of agricultural production in the countries of the region. Those calculations were based on the input-output tables prepared for all countries of the Eurasian region and the theory of production multipliers (Ksenofontov et al., 2018). The calculations were made in four stages:

- specific macro effects (production multipliers) for gross output, agricultural output, and GDP for the agriculture sector in the EAEU countries on the basis of a symmetric input-output table for the EAEU for 2020;
- normalised specific multiplier effects (normalised production multipliers) for gross output and GDP for the agriculture sector (as a ratio of the production multipliers of gross output and GDP to the production multiplier of output in agriculture);
- absolute multiplier effects of agricultural output on gross output and GDP for selected countries of the Eurasian region, based on cost estimates for agricultural production and normalised production multipliers for gross output and GDP for the agriculture sector; and
- absolute multiplier effects of export-oriented production for gross output and GDP in agriculture for selected countries of the Eurasian region, based on cost estimates for agricultural production sold in export markets, in unprocessed and processed form, and production multipliers for gross output and GDP for the agriculture sector.

2.3. Production and Resource Potential of the Agro-Industrial Complex in the Eurasian Region by 2035

Opportunities for Expanding the Sown Area

The Eurasian region has a high potential for expanding its sown area (see Annex 2).

Russia has the most significant resources of unused agricultural land. According to the "Report on the Status and Utilisation of Agricultural Land in the Russian Federation in 2020" (Ministry of Agriculture of the Russian Federation, 2022), as at 1 January 2021, the area of unused arable land was 18.8 million ha, or about 16% of total arable land. Based on the ratio of the actual sown area to the area of used arable land in the Russian Federation in 2021, the potential for expanding the sown area can be estimated at 15 million ha, if the vacant land is fully integrated into the economic cycle.

The main barrier to realising this potential is that it is mostly concentrated in regions with difficult agro-climatic conditions and/or severe logistical constraints hindering sales of agricultural products on domestic and export markets: 28% is in the Siberian Federal District; 27% in the Volga Federal District; 15% in the Ural Federal District; and 14% in the Non-Chernozem zone of the Central Federal District. In regions where crop production is highly profitable, the resources of vacant agricultural land have been exhausted to a greater extent over the recent years and are now relatively small. Along with the legal difficulties of alienating unused land, this severely hinders the growth of the sown area: in 2012–2021, the sown area increased by only 4.6 million ha, or 6%. Since 2016, the sown area has changed slightly, amounting to 79–80 million ha. This indicates that, despite high estimates of the area of unused arable land, the process of integrating new land into the economic cycle will be inertial, and the scale of extensive growth will be limited.

The prerequisites for using that resource potential include: development of the transport and logistical infrastructure of Siberia, the Urals, and the Volga region; stronger budgetary support for crop production in regions with difficult agro-climatic conditions and/or ensuring high prices

in the relevant agricultural markets; greater efficiency of the mechanism of state interventions in the grain market; and increased budget expenditures on land surveying and registration.

Kazakhstan also has significant agricultural land resources. In 2015, the area of unused and vacant arable land was estimated at 3.37 million ha (LIS "Adilet", 2018). Over the post-Soviet period, the country's sown area has decreased by 12.26 million ha, from 35.18 million ha in 1990 to 22.93 million ha in 2021. In 2016–2021, however, the sown area grew at an average annual rate of +0.32 million ha. If those rates are sustained in the future, the available resources of vacant arable land will be largely exhausted by 2035. The implementation of this scenario would call for significant efforts to reduce the area of eroded and disturbed lands, develop land reclamation, and register land plots.

For Uzbekistan, there are no publicly available estimates of resources of unused agricultural land, but the targets of land integration into the economic cycle could serve as a guideline. The Agricultural Development Strategy of the Republic of Uzbekistan for 2020–2030 provides for development of 1.1 million ha of new agricultural land (National Database of Legislation of the Republic of Uzbekistan, 2019). The sown area was decreasing in the past though. By 2021, it had shrunk by 0.96 million ha against the historic high of 1997. In 2016–2021, the sown area declined by 0.45 million ha (12%), including due to soil erosion and high salinity. To address these problems and break the trend of declining sown area, budget expenditures should be expanded, primarily to fund land reclamation and modernisation of the irrigation systems.

As at 1 January 2021, the area of unused agricultural land in Belarus was estimated at 0.4 million ha (5% of total agricultural land) (NEMS RB, 2021). By 2021, the sown area had decreased by 0.27 million ha, or 4%, compared to 1990. Since 2014, the total sown area been stable, at 5.8–6 million ha. It is not expected to expand significantly in the future.

In Armenia, according to the Strategy for the Main Directions of Economic Development of Agricultural Sector of the Republic of Armenia for 2020–2030, the area of unused arable land was estimated at 0.2 million ha in 2018, and it was planned to bring it down to 0.11 million ha by 2029 (Government of the Republic of the Republic of Armenia, 2019). In 2016–2021, the sown area decreased by 0.13 million ha, or 37%. Much of that sharp decline was due to political unrest and the change of the national government in 2018. The Strategy envisions an increase in the sown area to 0.33 million ha by 2029, which means a recovery to the levels of 2014–2016 and is quite realistic. There were even higher figures in the past — 0.44 million ha in 1990 — but they cannot be achieved in the foreseeable future.

In Kyrgyzstan, the area of unused arable land was estimated at only 0.05 million ha at the beginning of 2021 (4% of total arable land) (National Statistical Committee of the Kyrgyz Republic, 2021; Ministry of Agriculture of the Kyrgyz Republic, 2021). The scale of reduction of the sown area during the post-Soviet period was also relatively small (–0.06 million ha by 2021 compared to 1990). Since 2015, the sown area has expanded at an average rate of +0.007 million ha per year. At that pace, the rather modest potential for extensive growth in crop production will be completely exhausted by 2030–2035.

For Tajikistan, there are no publicly available estimates of the area of unused agricultural land. In 2021, the sown area was 0.05 million ha lower than the historic high (2004). There have been positive changes in the sown area over recent years, but there are no significant resources for extensive growth.

High Potential for Technological Progress

The countries of the Eurasian region have great opportunities to intensify agricultural production and improve land and livestock productivity. These are determined both by the

current technology level in agriculture, which is relatively low, and by the high output of mineral fertilizers, a key resource for ensuring greater efficiency in crop production.

A comparative analysis shows that the yields of most crops are at least 1.5–2 times lower in the countries of the Eurasian region than in developed countries (see Annex 3). This lag is due not only and not so much to the difficult agro-climatic conditions in the Eurasian region, but to the relatively low level of technology, insufficient available power, and low chemicalization of production (with the exception of Belarus).

Taking into account the large volumes of domestic production of mineral fertilizers in the Eurasian region[10] and the political difficulties hindering exports of fertilizers and natural gas to third countries due to Russia's special military operation in Ukraine, we can expect that the commodities will be used to a greater extent in the domestic markets of the Eurasian region. This should contribute to higher yields of basic crops.

Over the past 10–15 years, the countries of the region have seen moderate gains in the sown area and yields of basic crops, which predetermined an increase in gross yields and created a feed base for animal husbandry development.

At the same time, the growth of production in the agricultural sector relied on the transfer of foreign agricultural technologies, mainly from Western Europe and North America. As a result, the agricultural sector in the Eurasian region is currently heavily dependent on imports of resources for investment and current production use. This creates high political, economic, logistical, and other risks to sustaining the achieved production levels, as well as to supplying resources for new investment projects and modernisation of existing agro-industrial enterprises.

Significant difficulties in the process of intensifying crop production may arise due to interruptions in imports of agricultural machinery and components. Russia remains highly dependent on imports from Western countries (up to 50–100%) for equipment such as combine harvesters for selective breeding, 50–150 hp forage harvesters, equipment for plant protection, and seeding complexes (Rosspetsmash, 2021).

Another challenge is the high dependence on seeds imported from Western countries. According to estimates of the National Research University Higher School of Economics (Ivanov et al., 2020), in 2019, the share of foreign-selected seeds in domestic consumption in Russia was 98% for sugar beets; 89% for winter rapeseed; 88% for potatoes; 73% for sunflower seeds; 58% for corn; and 53% for peas and spring rapeseed. Lower imports of seeds for those crops can lead to a sharp reduction of the sown area and/or lower yields.

Similar difficulties can be observed in animal husbandry. According to the Ministry of Agriculture of the Russian Federation, the country's dependence on imports (mainly from Western countries) for hatching eggs and day-old chickens for the parent flock was 95–100% for poultry and 75–80% for eggs in 2019. The share of imports was also high for breeding stock and pedigree material, equipment for animal husbandry, feed additives, and veterinary drugs.

For Central Asian countries and Russian regions with an arid climate, land reclamation will be of great importance. Although the share of irrigated land is high in Uzbekistan, Tajikistan, and Kyrgyzstan, these countries retain a significant capacity for more efficient use of such land and introduction of moisture-saving technologies. At present, the region has one of the lowest levels of water use efficiency in agriculture in the world (Vinokurov, Ahunbaev, Usmanov et al., 2022) and a high level of unrealised economic benefits in water management (Vinokurov, Ahunbaev, Usmanov et al., 2021).

[10] Russia and Belarus are among the world leaders in mineral fertilizer production and exports.

Climate Change

Climate change affects agricultural output and the composition of products and technologies in the sector through changes in crop yields and livestock productivity, shifts in the structure of global agricultural production, leading to changes in the global agri-food market, as well as through a system of restrictions and commitments undertaken by countries under international treaties, including the Paris Agreement (Ksenofontov, Polzikov, 2020).

In 1976–2021, the Eurasian region saw an increase in average annual air temperatures, which peaked in a number of countries in 2021 (CIS ICH, 2022). The impact of climate change on food production will be mixed at the level of countries and individual products, and at the moment there is no certainty about the ultimate effect on the agro-industrial complex of the Eurasian region.

According to the main projections of the IPCC, FAO, and Roshydromet, most of Russia and Belarus will face a significant rise in temperature, especially in winter (by 1–2 °C by 2030) and a decrease in the number of days with frost (by 10–15 in Siberia and the Far East, 15–30 in the European part of the country) (Ksenofontov, Polzikov, 2020). Taking into account the projected increase in the duration of the warm period by an average of 35 days, on condition of sufficient moisture availability, the bioclimatic potential of the agricultural zone in the territory of both Russia and Belarus will expand by 8% by 2041–2060, and by 25% by 2100 (Ministry of Agriculture and Food of the Republic of Belarus, 2019).

The level of heat supply and the duration of the growing season are also projected to increase, which would be accompanied by higher precipitation during the cold season and lower precipitation during the warm season, with more arid conditions in the southern regions. The yields of cereal crops are therefore likely to increase by as much as 18.7% by 2030 in some regions of Russia (in the Northwestern Federal District) and to decrease by as much as 5.8% in others (in the Southern Federal District). According to IEF RAS estimates (Ksenofontov, Polzikov, 2020), changes in agro-climatic conditions in southern regions of Russia may lead to a decrease in grain exports by 4–5 million tonnes, depending on the scenario.

Central Asia is one of the regions that are most sensitive to climate change (Vinokurov et al., 2022). Temperatures are rising faster in Central Asia than the global average, leading to shrinking of glaciers, with their volume declining by nearly 30% over the past 50 years. This entails a likely decrease in river flow and creates risks for agriculture and food security in the region. Drying out of the soil can reduce crop yields by 30–50%. According to various estimates, climate change in the Central Asian region will have the most adverse impact on agriculture in Kazakhstan, especially in its northern regions, where grain is mainly cultivated.

The green agenda is of strategic importance for agriculture and food security in the EAEU countries, Tajikistan, and Uzbekistan, and could become a driver of sustainable economic growth in the region. In 2020, greenhouse gas emissions from agriculture were lower in Russia (by half), Belarus (by a third), and Kazakhstan (by almost 10%) compared to 1990 (Roshydromet, 2022; Ministry of Natural Resources and Environmental Protection of the Republic of Belarus, 2022; Ministry of Ecology, Geology, and Natural Resources of the Republic of Kazakhstan, 2022). This trend could be a significant factor in terms of the investment attractiveness and export potential of the agricultural sector. Reducing the carbon intensity of agricultural enterprises improves the profitability of their production by up to 50% (SberPress, 2021).

Following global trends, the EAEU is engaged in efforts to assist agriculture to adapt to climate change and ensure sustainable development of the agro-industrial complex of its member countries, with the EEC in a coordinating role. Among the main areas of such work by the EAEU are organic agriculture, the preservation and restoration of soil fertility, the development of fisheries and aquaculture, and precision farming.

Scenario-Based Forecasts of Food Production

Based on analysing the resource potential and past processes of agricultural development in the Eurasian region, two growth scenarios were formulated for the period until 2035 — an inertial scenario and a targeted scenario.

The **inertial scenario** for the development of the agro-industrial complex of the Eurasian region assumes the persistence of various constraints until 2035. The inertial development of the agricultural sector and constraints related to capital, management resources and skilled labour, technologies, agricultural machinery, equipment, and other resources for investment and current production will continue to hinder the region's production and resource potential.

Additional effects on the development of the sector will be generated by climate change (intensified aridity in some regions and increased excess moisture in others; higher frequency and intensity of natural hazards) and demographic shifts (the outflow of young people and aging of the rural population), as well as changes in the consumption of agricultural products for food and production purposes (lower demand for certain foodstuffs, such as potatoes; lower feed consumption due to reduced feed intensity in animal husbandry).

The inertial scenario was built by extrapolating past trends. A very moderate expansion of the total sown area is expected. The total sown area will increase by only 3.2 million ha, from 114.8 million ha in 2021 to 118 million ha in 2035 (see Annex 4). The shares of individual crops in the total sown area will continue to demonstrate inertial change. For instance, the estimated reduction in the sown area under potatoes and vegetables in Russia and Belarus during the period is explained by an improvement in their yields, accompanied by falling domestic demand, as well as negative demographic trends in rural areas.

The estimates of gains in yields in the countries of the region vary significantly depending on the level of fertilizer application and the patterns during 2017–2021 (see Annex 5). In particular, for Kazakhstan, Tajikistan, and Uzbekistan, the extrapolation of past trends gives relatively low gains in mineral fertilizer application and yields, despite their high intensification potential. In Belarus, chemicalization rates are comparable to those in Western European countries and are not expected to increase significantly before 2035. For Armenia, significant gains in yields are explained by the hypothesis used in the scenario that the growth of mineral fertilizer use would be high, bouncing back to the levels of 2013–2015.

As to livestock, production is estimated by extrapolating past trends from 2016–2021. For some types of products in selected countries of the Eurasian region, the levels of production targeted in national plans for agro-industrial development are taken into account, if they broadly correspond to past trends. However, for most products and countries, the values of production growth in the forecast period are assumed to be at the level of average annual growth in 2016–2021. The only exception is Russia: due to restrictions on imports of equipment for animal husbandry and processing, breeding stock, and other investment resources from Western countries, gains in production of livestock products have been reduced for the forecast period compared to past ones.

Development of the agro-industrial complex in the Eurasian region until 2035 under the inertial scenario will be characterised by relatively low growth — 1.5% on average per year. In energy value, the region's total food production will increase by 156 trillion kcal (24% over 15 years), from the average of 661 trillion kcal in 2017–2021, reaching 817 trillion kcal in 2035. For most crops, the increase in production will be due to gains in yields and intensification of production amid growing consumption in the region (see Annex 6).

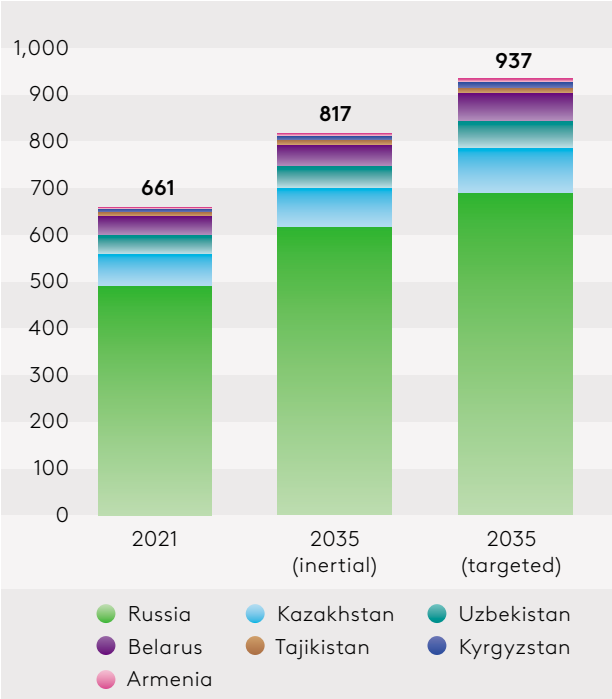
In the **targeted scenario**, normative logic was applied, according to which higher rates of extensive and intensive growth of domestic agricultural production (compared to the inertial scenario) can be ensured through proactive government policies to promote agricultural production and the development of market infrastructure.

Normative logic suggests that the countries of the region will focus more on self-sufficiency in basic food products that for which the domestic market is highly dependent on imports, but where resources exist to expand their domestic production. Import substitution could be achieved both by creating customs tariff and non-tariff barriers to protect national agricultural producers from competition from foreign suppliers and by increasing budget expenditures to support national agricultural producers.

In the countries of the Eurasian region, there is space to further promote the growth of the agricultural sector by pursuing more active policies aimed at lifting the current restrictions in terms of demand and opportunities for the movement of agro-industrial products in domestic and export markets, as well as to reduce financial, price, spatial, and other distortions in agriculture. For example, in Russia, accelerated development of transport and logistics infrastructure, fixed-route transportation, deep processing of grain, and animal husbandry would enable broader utilisation of the resource potential of Siberia, the Volga region, and the Urals.

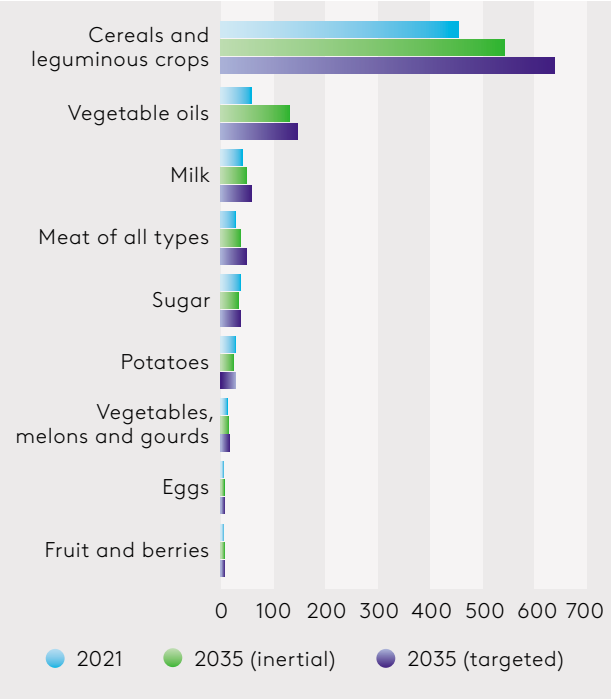
The targeted scenario is based on planned indicators for the development of the agro-industrial complex contained in policy documents of the countries of the Eurasian region or the self-sufficiency standards prescribed in strategic documents on food security (if they do not exceed the potential extensive and intensive growth of domestic production).

↓ **Figure 10. Volume of Food Production in the Eurasian Region under Different Scenarios, by Country (kcal trillions)**



Source: EDB calculations.

↓ **Figure 11. Volume of Food Production in the Eurasian Region under Different Scenarios, by Product (kcal trillions)**



Source: EDB calculations.

Compared to the inertial scenario, the targeted one assumes a very moderate increase in the overall sown area in the Eurasian region as a whole — 122 million ha against 118 million ha (see Annex 7). A more significant contribution to gains in agricultural production should be generated through accelerated intensification of crop production, including its more dynamic technical and technological modernisation, and increasing available power and the use of mineral fertilizers, expansion of irrigated areas, and implementation of land reclamation measures (see Annex 8).

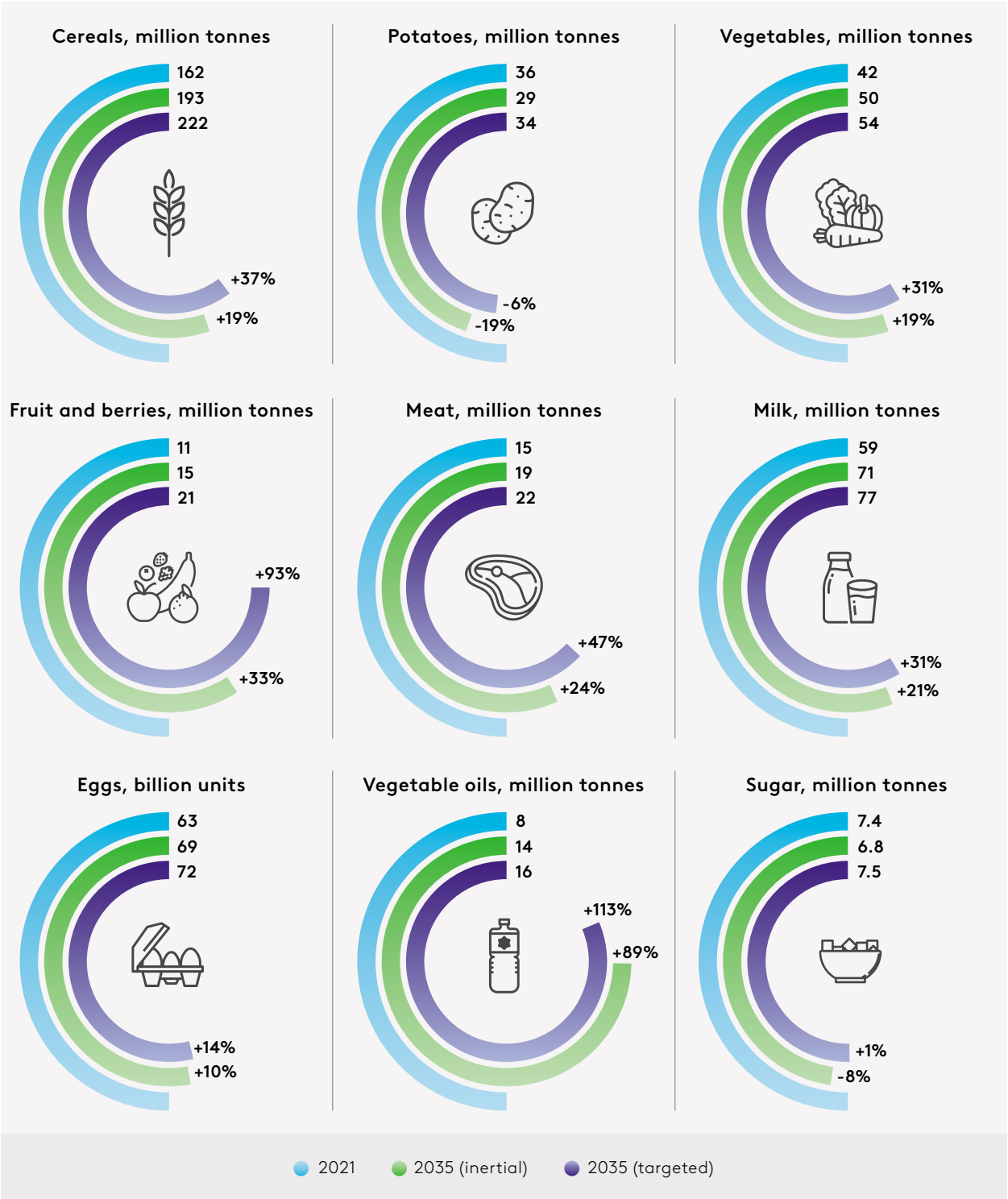
As a result, the agro-industrial complex in the Eurasian region until 2035 will be characterised under the targeted scenario by higher growth rates — 2.5% on average per year. In terms of energy value, total food production will increase by 276 trillion kcal (42% over 15 years) — from the average of 661 trillion kcal in 2017–2021 to 937 trillion kcal in 2035.

As to product categories in general for the countries of the Eurasian region, both scenarios assume a significant increase in domestic production of agro-industrial products until 2035 (see Annex 9):

- for grain — from 155.8 million tonnes in 2021 to 192.6 million tonnes (inertial scenario) and to 222.1 million tonnes (targeted scenario);
- for oilseeds — from 30.3 million tonnes to 44.0 million tonnes (inertial scenario) and to 50.0 million tonnes (targeted scenario);
- for sugar beets — from 45.8 million tonnes to 49.2 million tonnes (inertial scenario) and to 54.1 million tonnes (targeted scenario);
- for vegetables, melons and gourds — from 43.1 million tonnes to 49.6 million tonnes (inertial scenario) and to 54.4 million tonnes (targeted scenario);
- for fruit and berries — from 11.8 million tonnes to 14.7 million tonnes (inertial scenario) and to 21.3 million tonnes (targeted scenario);
- for meat of all types — from 16.0 million tonnes in carcass weight equivalent to 19.0 million tonnes (inertial scenario) and to 22.4 million tonnes (targeted scenario);
- for milk — from 61.0 million tonnes to 71.1 million tonnes (inertial scenario) and to 76.9 million tonnes (targeted scenario);
- for eggs — from 63.1 billion to 69.3 billion units (inertial scenario) and to 71.6 billion units (targeted scenario);
- for sugar — from 6.5 million tonnes to 6.7 million tonnes (inertial scenario) and to 7.3 million tonnes (targeted scenario); and
- for vegetable oils — from 7.7 million tonnes to 14.3 million tonnes (inertial scenario) and 16.2 million tonnes (targeted scenario).

It is only the domestic production of potatoes that is expected to stagnate or even decrease — from 33.1 million tonnes to 29.4 million tonnes (inertial scenario) and to 33.8 million tonnes (inertial scenario), due to negative demographic trends in rural areas of the Russian Federation and Belarus and the resulting reduction of sown areas and gross potato yields at private subsidiary farms.

↓ Figure 12. Potential Volume of Food Production in the Eurasian Region



Source: EDB calculations.

2.4. Food Needs and Market Capacity in the Eurasian Region by 2035

A comprehensive assessment of food needs in the Eurasian region, consisting of demand for food and production purposes, is the next stage in estimating the export potential. As is the case with the production and resource potential, we prepared an inertial and a targeted scenario.

Both scenarios rely on the same medium scenario projection of population change in the Eurasian region prepared by the UN — an increase in the population by 8.8 million people (+0.3% on average per year for 15 years), from 229.2 million in 2021 to 238 million in 2035. The population growth by 13.1 million in Central Asia (+6.1 million in Uzbekistan; +3.0 million in Kazakhstan; +2.6 million in Tajikistan; +1.4 million in Kyrgyzstan) is expected to be enough to offset the population decline in Russia (–3.6 million), Belarus (–0.6 million), and Armenia (–0.1 million) (see the exogenous parameters in Annexes 16 and 17).

The scenarios differ in per capita consumption parameters and parameters of consumption of food products for production purposes.

Under the inertial scenario, almost all products are characterised by inertial changes in per capita consumption parameters. In most countries, a moderate increase in the consumption of meat and dairy products, eggs, and fruit is expected, while the consumption of potatoes, grain products, and sugar will stagnate or decrease. In the period until 2035, the overall per capita food consumption in the countries of the Eurasian region, with the exception of Tajikistan, will be in general comparable to the current indicators for developed countries (see Annex 12). The use of crop products for seeds is estimated based on an assumption of unchanged seeding rates. The estimates of future sown area obtained at the second stage of the analysis are also used here. The estimates for egg consumption for production purposes (for hatching) are based on the assumption that the average slaughter weight of poultry remains unchanged.

Under the targeted scenario, the volumes of domestic production of certain types of agro-industrial products are assumed to be higher in the context of additional budget support and protection of national agricultural producers against competition from imports. As a result, the targeted scenario generates higher estimates of per capita consumption for those products than under the inertial scenario (see Annex 14). Under the targeted scenario, the per capita consumption in most countries of the Eurasian region will reach the highest levels of developed countries in terms of many products or will even significantly exceeds them. The conditions for the realisation of that scenario include an increase in real household incomes and a significant decrease in relative prices for products with additional domestic output estimated for the calculations.

To design scenarios for changes in domestic consumption of agro-industrial products, consumer demand models have been built (see the model quality characteristics in Annex 11). The models enable estimation of future per capita consumption of basic food products, depending on a given pattern of real household incomes, as well as physical volumes of domestic production and — for selected food groups and countries of the Eurasian region — imports and exports of agro-industrial products (see Annex 15).

Over the past 15 years, the food consumption pattern in the region has been determined by the following factors:

- a moderate decrease in the population in Russia, Belarus, Armenia and fairly intensive population growth in Uzbekistan, Kazakhstan, Kyrgyzstan, and Tajikistan — the total population of the Eurasian region grew from 210 million in 2006 to 229 million in 2021;

- an increase in per capita consumption of most food products (other than potatoes, grain products, and sugar, except for some countries in the Eurasian region).

In turn, the per capita food consumption has changed due to:

- growth of real household incomes[11] and greater affordability of more expensive types of food, such as meat and dairy products, fruit and berries, vegetables, and eggs;

- an increase in the physical volumes of domestic production of most types of agricultural products (especially meat, eggs, vegetables, vegetable oil) and a decrease in relative prices for relevant products compared to other consumer goods and services;

- structural changes in food consumption stereotypes associated with the spread of the "Western" consumption model and the principles of healthy eating, as well as ethnic, religious, and others sociocultural factors.

It should be noted that, despite the significant impact of the COVID-19 pandemic on all aspects of economic development and people's lives in the countries of the Eurasian region, its effects on food consumption were quite moderate. This is due to the lack of flexibility of consumer behaviour patterns — at times of economic crises, people resort to saving on food last of all — and the crisis response measures taken by governments to curb the negative impacts of quarantine restrictions on households, as well as the relative inertia of agri-food production.

Fluctuations in demand for agricultural products were actually offset by changes in sales prices and, thus, by the margins of agricultural production. At the same time, retail food prices had remained fairly stable until the end of 2020, when they began to rise following a sharp increase in prices on the global agri-food market. But, first, the growth was limited by measures taken to regulate agricultural exports and domestic market prices (introduction of export duties and quotas, agreements on maximum wholesale and retail prices for sugar and sunflower oil in Russia) and, second, it was offset by social payments to low-income groups of the population (families with children, pensioners).

The share of imports of agro-industrial products from third countries is small. Therefore, the risks of negative consequences for the domestic market in the event of logistics disruptions and/or the refusal of foreign suppliers to import certain types of food to Russia or other countries of the Eurasian region for political reasons are quite low.

Variations in gross crop yields due to favourable or unfavourable weather conditions have a significantly greater effect on food consumption.

Cross-country comparisons of per capita food consumption in the Eurasian region and in developed and developing countries (see Annex 10) show great growth potential for such products as meat (except for Belarus), dairy products (except for Uzbekistan), fruit and berries (except for Armenia, Belarus, and Uzbekistan), and sugar (except for Russia and Belarus). It should be noted, however, that there are significant differences in the composition of food consumption and a large variation of indicators of per capita consumption of some products, even between countries with comparable climatic conditions and household income levels.

[11] Until 2013, a generally steady increase in real household incomes had been observed in all countries of the Eurasian region. But in 2014, the pattern of real household incomes in Russia, Belarus, and Armenia became extremely volatile, showing a significant decrease in 2015–2016 and 2020–2021 due to the impacts of sanctions imposed by Western countries over those years against Russia, the unfavourable conditions on global commodity markets, the coronavirus pandemic, as well as the political unrest in Armenia.

In addition to the consumption of agricultural products for food, a significant part of domestic demand is formed by consumption for production purposes — for feed, seeds, and non-food processing. The evolution of demand for production purposes is determined by the efficiency of agricultural production and its physical output volumes.

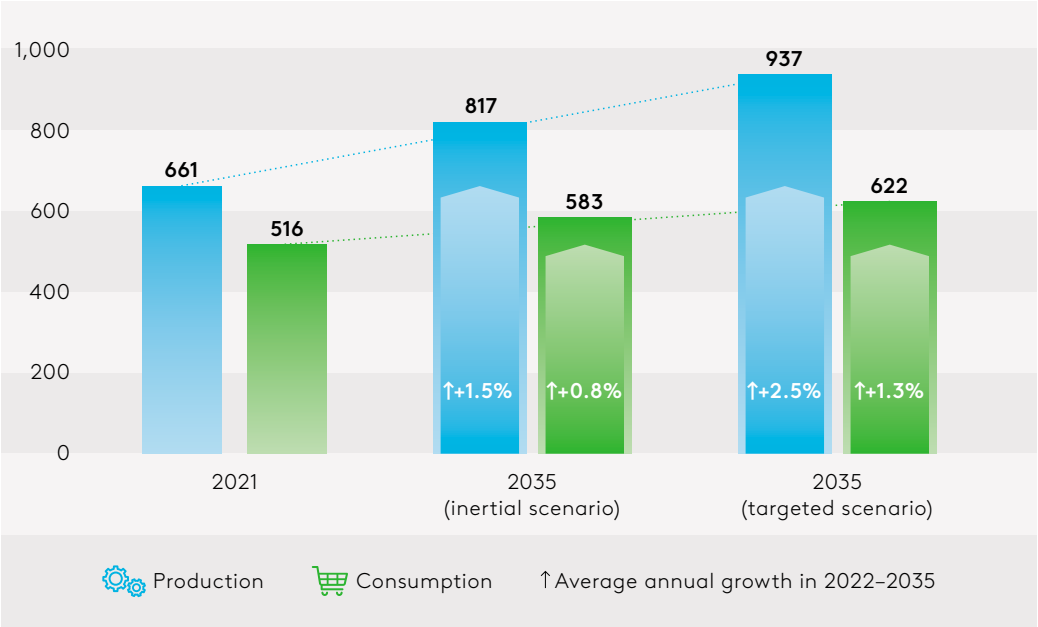
Over the past 15 years, grain consumption for production purposes has remained relatively stable or increased moderately in most countries of the Eurasian region, with the exception of Uzbekistan, Tajikistan, and Armenia, where it grew more rapidly against the background of fast growth of domestic livestock production. At the same time, in Russia, Belarus, Kazakhstan, and Armenia, the increase in physical volumes of meat and egg production was also significant, but its impact on intermediate grain consumption was offset by a comparable decrease in the feed intensity of animal husbandry.

The effect of declining feed intensity is gradually wearing off as the potential for improving the efficiency of animal husbandry is exhausted. As a result, the continuing increase in domestic production of meat products (including for export) determines higher consumption of grain for feed.

Over the recent years, the pattern of consumption of crop products for seeds has been determined in the countries of the Eurasian region, first, by the trend of moderate expansion of sown area and, second, by lower seeding rates per hectare of crops due to crop production intensification and improved seed quality.

Until 2035, the feed intensity of animal husbandry and seeding rates should be expected to change less significantly than over the past 15–20 years. For Russia, Belarus, Kazakhstan, and Armenia, it will be associated with gradual exhaustion of the potential for improving the efficiency of agricultural production, while for Uzbekistan, Kyrgyzstan, and Tajikistan — with focusing more on extensive agricultural growth. The consumption of milk for production purposes will be determined by trends in the cattle population, i.e. the average productivity and gross milk yields, as well as calf yields and death rates, while the consumption of eggs for those purposes will depend on poultry meat production volumes and the average slaughter weight of broilers. The intensification of production will also be quite moderate in those sectors.

Scenario-based estimates of consumption of food products in the Eurasian region until 2035 indicate low rates of consumption growth for both the inertial and the targeted scenario: an average of 0.8% and 1.3% per year, respectively. In terms of its energy value, the food consumption in the region will increase by 65 trillion kcal — by 13% over 15 years — from 517 trillion kcal on average for 2017–2021 to 583 trillion and 622 trillion kcal in 2035 under the two scenarios, respectively (see Annexes 13 and 15). Moderate growth of domestic food consumption against the background of potentially faster growth of domestic production under both scenarios contributes to an increase in the export potential of the Eurasian region (see Figure 13). The main food consumption market within the region is Russia (67%). It should be noted that the level of food consumption in Uzbekistan (10%) is equivalent to that in Kazakhstan (10.6%), while the population of the former is significantly larger.



← Figure 13. Volume of Food Production and Consumption in the Eurasian Region under Different Scenarios (kcal trillions)

Source: EDB calculations.

In total, the overall domestic consumption in the Eurasian region may increase:

- for grain — from 118.3 million tonnes in 2021 to 133.2 million tonnes under the inertial scenario and to 143.6 million tonnes under the targeted scenario;
- for oilseeds — from 25.3 million tonnes to 43.4 million tonnes (inertial scenario) and 49 million tonnes (targeted scenario);
- for sugar beet — from 47.7 million tonnes to 49.2 million tonnes (inertial scenario) and to 54.1 million tonnes (targeted scenario);
- for vegetables, melons and gourds — from 41.8 million tonnes to 47.7 million tonnes (inertial scenario) and to 50.7 million tonnes (targeted scenario);
- for fruit and berries — from 18.2 million tonnes to 21.2 million tonnes (inertial scenario) and to 25.2 million tonnes (targeted scenario);
- for meat of all types — from 16 million tonnes in carcass weight equivalent to 18.5 million tonnes (inertial scenario) and to 19.9 million tonnes (targeted scenario);
- for milk — from 62.8 million tonnes to 69.3 million tonnes (inertial scenario) and to 73.4 million tonnes (targeted scenario);
- for eggs — from 63.5 billion units to 69.3 billion units (inertial scenario) and to 72.3 billion units (targeted scenario); and
- for sugar — from 5.1 million tonnes to 5.7 million tonnes (inertial scenario) and to 5.8 million tonnes (targeted scenario).

The domestic production is expected to stagnate or decrease for potatoes (from 35.8 million tonnes to 33.6 million tonnes and 35.3 million tonnes, respectively) and vegetable oils (from 7.8 million tonnes to 7.7 million and 7.8 million tonnes).

The results of estimating the physical volumes of domestic consumption of agricultural products under the inertial scenario show that the greatest changes in domestic consumption can be expected for the following products:

- in Armenia: for fruit and berries (+51% by 2035 compared to the average of 2017–2021), meat (+28%), and potatoes (–32%);
- in Belarus: for potatoes (–19%);
- in Kazakhstan: for meat (+47%), vegetables, melons and gourds (+43%), milk (+34%), eggs (+29%), and sugar (+22%);
- in Kyrgyzstan: for meat (+51%), eggs (+36%), grain (+30%), and milk (+29%);
- in Russia: for fruit and berries (+27%), and potatoes (–25%);
- in Tajikistan: for eggs (+125%), meat (+103%), vegetable oils (+57%), milk (+53%), grain (+52%), vegetables, melons and gourds (+50%), sugar (+43%), fruit and berries (+41%), and potatoes (+34%); and
- in Uzbekistan: for eggs (+43%), potatoes (+38%), grain (+32%), meat (+30%), milk (+25%), and vegetable oils (+19%).

Under the targeted (normative) scenario, the largest changes in physical volumes of domestic consumption are expected for the following products:

- in Armenia: for fruit (+90% by 2035 compared to the average of 2017–2021), meat (+53%), grain (+35%), eggs (+27%), milk (+25%), and potatoes (–32%);
- in Belarus: for grain (+29%), and potatoes (–19%);
- in Kazakhstan: for meat (+68%), eggs (+58%), vegetables, melons and gourds (+45%), milk (+34%), sugar (+27%), grain (+19%), and potatoes (+19%);
- in Kyrgyzstan: meat (+63%), milk (+58%), grain (+45%), vegetable oils (+37%), eggs (+37%), vegetables, melons and gourds (+31%), fruit and berries (+25%);
- in Russia: for fruit and berries (+62%), grain (+20%), meat (+16%), potatoes (–20%);
- in Tajikistan: for meat (+147%), eggs (+127%), milk (+125%), vegetables, melons and gourds (+95%), grain (+79%), fruit and berries (+49%), potatoes (+57%), vegetable oils (+57%), and sugar (+39%); and
- in Uzbekistan: for eggs (+60%), grain (+54%), meat (+53%), potatoes (+40%), milk (+38%), fruit and berries (+25%), vegetable oils (+19%), sugar (+16%), vegetables, melons and gourds (+16%).

These estimates of future domestic demand should be seen as best-case, since they were obtained for the inertial (relatively high) scenarios of economic and welfare growth in the countries of the Eurasian region. If the actual growth rates of real household incomes are less than those used for the estimates[12], the effective domestic demand will also be lower. Therefore, as the resource potential of agriculture aimed at satisfying high domestic demand is realised, there may be overproduction crises. Those crises could be mitigated by stimulating domestic demand (procurement interventions, targeted social assistance to low-income groups) or expanding exports of agro-industrial products. In this case, exports will act as a factor ensuring an equilibrium in the domestic market.

[12] In the face of the strong pressure of sanctions and severe restrictions imposed by Western countries on technology transfer, imports of equipment, and borrowing in financial markets, scenarios of low economic growth rates seem to be quite realistic, at least for Russia.

3. REALIZING THE POTENTIAL OF THE AGRO-INDUSTRIAL COMPLEX OF THE EURASIAN REGION

3.1. Scenario-Based Estimation of Export Potential for Basic Food Products

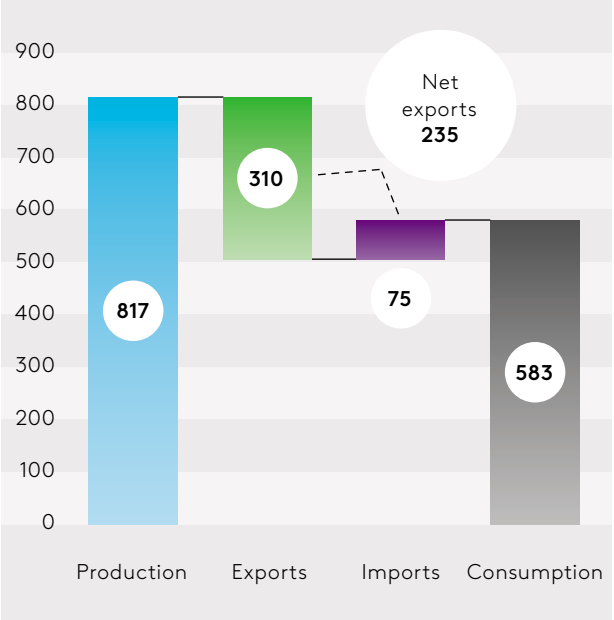
Scenario-based estimation of the resource potential of exports of the Eurasian region is the final stage of our analysis. The estimation is based on balance logic and scenario-based estimates of future volumes of domestic production and imports of agri-food products, made at earlier stages of the analysis, less domestic consumption for food and production purposes[13].

The results indicate an increase in export potential in the Eurasian region under the scenarios considered as a result of domestic production outpacing domestic consumption. Total exports may increase by a factor of 1.5 in terms of energy value by 2035 compared to 2021 under the inertial scenario — by 109 trillion kcal to 310 trillion kcal — and by a factor of 1.9 under the targeted scenario — by 174 trillion kcal to 375 trillion kcal. Net exports may reach 235 trillion kcal and 314 trillion kcal, respectively, by 2035 (145 trillion kcal on average in 2014–2021).

There will be growth of exports of most products. The resource potential of exports in the Eurasian region as a whole is expected to decline only for potato production due to negative demographic trends in rural areas and a decrease in sown area and gross yields at private subsidiary farms in Russia and Belarus, and for egg production due to import substitution in the Russian market. Under the inertial scenario, the export potential also declines in sugar production, which is explained by the effect of a high base — high sugar exports in 2019–2020 against the background of record high sugar beet yields in Russia and Belarus.

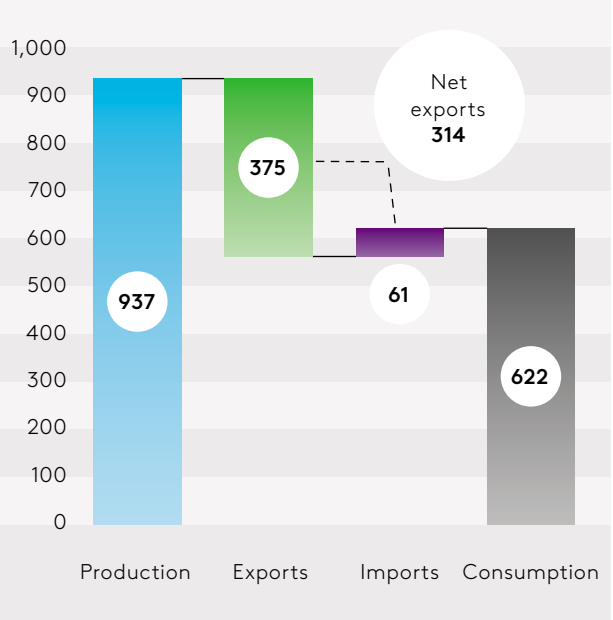
[13] Under the inertial scenario, it is assumed that the past trends of the evolution of the share of imports in domestic consumption would remain unchanged, and the targeted scenario is based on the assumption that the share would decline in alignment with the rates of food self-sufficiency.

↓ **Figure 14. Key Inertial Scenario Parameters, 2035 (kcal trillions)**



Source: EDB calculations.

↓ **Figure 15. Key Targeted Scenario Parameters, 2035 (kcal trillions)**

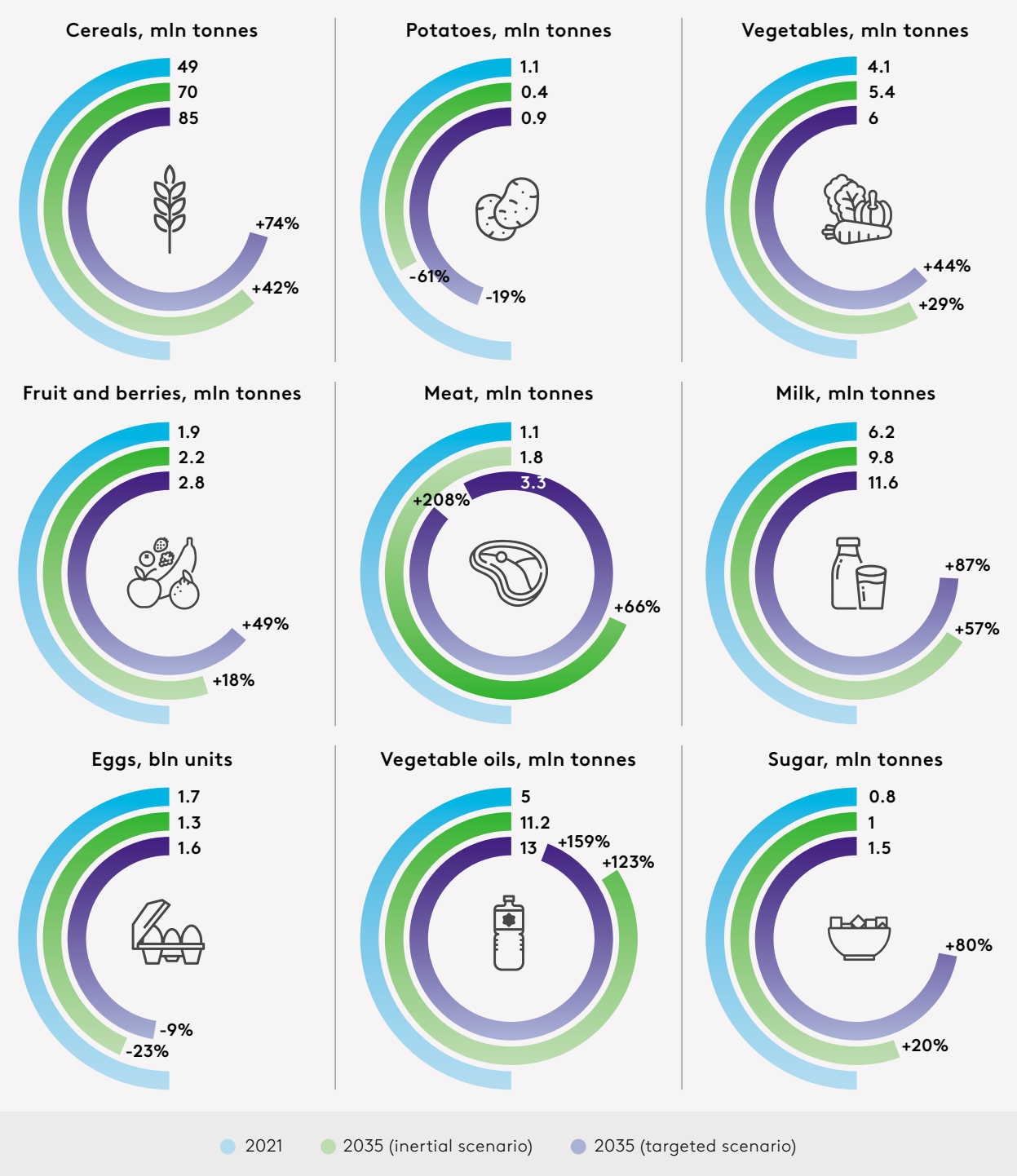


Source: EDB calculations.

Under the inertial scenario, we estimate the export potential (see Annex 18) of the Eurasian region as a whole, taking into account mutual trade: for grain at 69.76 million tonnes (45% of the domestic production in the Eurasian region in 2021); for potatoes at 0.43 million tonnes (1%); for vegetables, melons and gourds at 5.35 million tonnes (12%); for fruit and berries at 2.24 million tonnes (19%); for meat of all types at 1.80 million tonnes in carcass weight equivalent (11%); for dairy products at 9.76 million tonnes in terms of milk (11%); for eggs at 1.33 billion units (2%); for vegetable oils at 11.22 million tonnes (145%); and for sugar at 1 million tonnes (15%).

Under the targeted scenario, the export potential estimates (see Annex 19) are generally higher: for grain by 15.54 million tonnes (about 10% of the domestic production of the Eurasian region in 2021); for potatoes by 0.45 million tonnes (1%); for vegetables, melons and gourds by 0.62 million tonnes (1%); for fruit and berries by 0.59 million tonnes (5%); for meat of all types by 1.53 million tonnes in carcass weight equivalent (10%); for dairy products by 1.82 million tonnes in terms of milk (3%); for eggs by 0.23 billion units (0%); for vegetable oils by 1.79 million tonnes (23%); and for sugar by 0.51 million tonnes (8%).

↓ Figure 16. Potential Volume of Food Exports in the Eurasian Region



Source: EDB calculations.

By 2035, net exports (see Annex 20) in the Eurasian region as a whole should account for a significant share of domestic production of grain (31% and 35% under the inertial and the targeted scenarios, respectively) and vegetable oil (60% and 65%), and for a less significant share of domestic production of meat (3% and 11%) and dairy products (3% and 5%), as well as vegetables, melons and gourds (4% and 7%). As to other products, imports from third countries will predominate, and the share of net imports in total domestic consumption of the Eurasian region is estimated: for fruit and berries at 32% and 16% under the inertial and targeted scenarios, respectively; for sugar at 18% and 8%; for potatoes at 13% and 4%; and for eggs at 1% and 0.02%.

↓ **Table 6. Estimates of Nominal Exports of the Agro-Industrial Complex of the Eurasian Region, 2035, under Different Scenarios (USD millions, at 2020 prices)**

	Average for 2017–2021	Inertial	Targeted	Average for 2017–2021	Inertial	Targeted
Armenia	722.0	1,352.6	1,339.1	1.9%	2.1%	1.8%
Belarus	5,397.3	7,421.5	10,239.6	14.5%	11.8%	13.8%
Kazakhstan	3,250.5	4,597.5	6,191.8	8.7%	7.3%	8.3%
Kyrgyzstan	218.2	291.4	375.6	0.6%	0.5%	0.5%
Russia	25,774.9	47,528.0	53,796.6	69.3%	75.3%	72.4%
Tajikistan	36.3	66.7	90.7	0.1%	0.1%	0.1%
Uzbekistan	1,820.2	1,893.8	2,284.4	4.9%	3.0%	3.1%
Total	**37,219.5**	**63,151.5**	**74,317.9**	**100%**	**100%**	**100%**

Source: EDB calculations.

In value terms, exports of agricultural raw materials from the Eurasian region will increase from USD 39.7 billion (at 2020 prices) in 2021 to USD 63.2 billion in 2035 under the inertial scenario and to USD 72.3 billion in 2035 under the targeted scenario. The greatest contribution to the growth of exports of agricultural products in value terms until 2035 should be made by the production and processing of oilseeds and cereal crops, as well as the meat and dairy sectors and — in significantly smaller volumes — by vegetables and fruit. Russia has the largest nominal volumes of exports and export growth, followed — far behind — by Belarus, Kazakhstan, and Uzbekistan. The contributions of Armenia, Kyrgyzstan, and Tajikistan to exports in value terms remain insignificant.

Box 4. Forecast of Mutual Trade in Agro-Industrial Goods

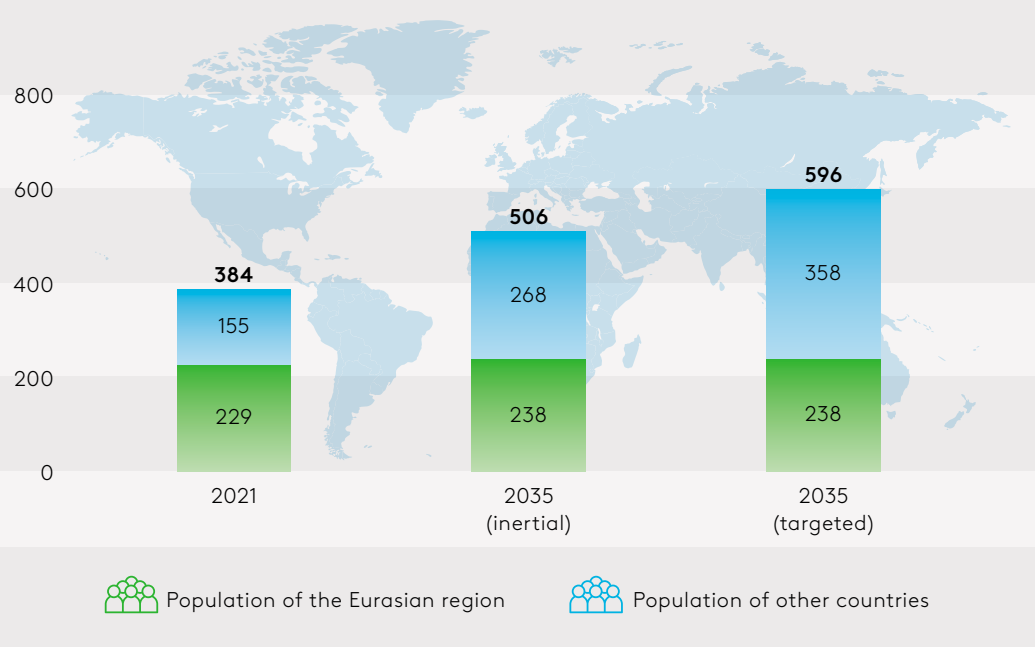
Prospects for the growth of mutual trade in agro-industrial goods will depend on the growth of domestic demand and the expansion of output by agro-industrial enterprises. The growth of the population in Eurasia (+0.3% on average per year for 15 years), improved living standards, and, therefore, better affordability of food will determine the potential growth of domestic demand. Prospects for expanding production and trade will depend on opportunities for expanding the sown area, intensifying production, overcoming transport and logistics constraints, and other factors.

Under the EDB's inertial scenario for agricultural development, mutual trade in agro-industrial goods within the region will grow by a factor of 1.5, from USD 15.4 billion in 2021 to USD 23.6 billion in 2035. Under the targeted scenario, mutual trade will increase by a factor of 1.8, to USD 27.1 billion in 2035. Given the saturation of the domestic market, mutual trade growth will lag behind total export growth. Under both scenarios, the share of mutual trade in total trade will decrease from 33% (the average for the past five years) to 32.2% (inertial scenario) and 30.6% (targeted scenario) by 2035.

The product composition of the export resource potential differs significantly for the selected countries of the Eurasian region due to unique features of their specialisation in agricultural production:

- Russia and Kazakhstan, the main contribution is and will be made by cereal crops and oilseeds;
- Belarus — dairy products, meat, and oilseeds;
- Uzbekistan and Armenia — vegetables, melons and gourds, and fruit;
- Kyrgyzstan — dairy products and fruit; and
- Tajikistan — vegetables, melons and gourds.

Expanded domestic production of agri-food products should strengthen the position of suppliers from the countries of the Eurasian region in the global agri-food market, enabling their significant contribution to addressing the problem of global food security.



← **Figure 17. Number of People Depending on the Agro-Industrial Complex of the Eurasian Region (millions)***

Note: * as at 31 August 2022.
Source: EDB calculations.

In 2021, the actual levels of agricultural production were sufficient to meet the demand on domestic markets of the Eurasian region almost in full (while sustaining relatively high food consumption rates for a total population of 229 million) and to export food to third countries in quantities sufficient to meet the needs of 155 million people. By 2035, the population of the countries of the Eurasian region will reach 238 million, while the population of third countries whose dietary needs are fully met through net exports of agri-food products from the Eurasian region will increase to 268 million under the inertial scenario and to 358 million

under the targeted scenario[14]. Thus, the total population whose needs are met with agro-industrial products originating from the Eurasian region will increase from 384 million to 506 million (inertial scenario) and 596 million (targeted scenario), or about 5–6% of the world's population.

More generally, due to its geographical proximity to major food consuming regions, the agricultural sector of the Eurasian region will be able to expand its presence in the market, which has more than 3 billion consumers, including China, India, and other countries in Asia and the Middle East. At the same time, in order to significantly expand the share in that market, it is necessary to improve transport logistics, including the development of the North-South ITC, the Eurasian Transport Framework, and other projects that enhance connectivity in the southeastern and southwestern directions.

3.2. Potential of External Markets for Food Products from the Eurasian Region

Conditional scenario-based calculations were made to determine the probable geographical composition of potential exports of food products from the Eurasian region. We used OECD-FAO (2022) projections for the physical volumes and country composition of global food imports and determined the shares of the Eurasian region in the markets of selected countries and the global market that would be sufficient to realise the resource potential for exports of agro-industrial products.

In most cases (12 countries and "Other countries", 11 products), the share of countries of the Eurasian region was set equal to the average share in 2019–2021, but in a number of cases (in particular, exports of wheat to Iran or exports of wheat, corn, other cereals, vegetable oils, poultry meat, beef, and pork to China), the assumption is that the share of the countries of the Eurasian region in corresponding supplies will increase. Comparing the dynamics, as well as the geographical and commodity composition of global food imports, with projected exports from the countries of the Eurasian region makes possible an ultimate assessment of the severity of constraints on demand in foreign markets.

In recent decades, most segments of the global agri-food market saw growth in total import volumes. Despite some differences in estimates, current global market development projections suggest that these trends should persist (see Annex 21). This is a result of continued growth of the world's population, improved welfare of the population, and shifts in food consumption patterns in developing countries, as well as natural constraints on expanding domestic agricultural production in the countries of North and Central Africa, Southeast Asia, and the Persian Gulf, which are currently major importers of agro-industrial products.

[14] The number of people whose food needs are met by supplies from the countries of the Eurasian region is determined on the basis of the physical volumes of net exports of major agro-industrial products, the average caloric value of food produced from the corresponding products, as well as the average global energy value of the diet in 2019 (2,940 kcal per day per person). The rates of conversion from kilograms to calories are estimated separately for each country, based on FAOSTAT data on per capita food supply in kg per year and in kcal per day. Thus, country specifics have been taken into account in the structure of aggregate commodity groups (fruit, vegetables, dairy products, meat), which include food products with different average caloric values. The global average energy value of the diet (instead of, for example, the energy value of the diet in the least developed countries) is selected based on the current and future composition of food exports from the Eurasian region to third countries; it is dominated by countries with an average energy value close to global indicators.

According to the forecast of the OECD-FAO (2022), by 2031, global imports will increase: wheat imports to 217.9 million tonnes (increased by 32.6 million tonnes compared to 2019–2021, +18%); corn to 200.8 million tonnes (by 19.5 million tonnes, +11%); rice to 64.5 million tonnes (by 17.9 million tonnes, +11%); other cereals to 49.0 million tonnes (by 4.7 million tonnes, +38%); soya beans to 178.8 million tonnes (by 18.3 million tonnes, +11%); other oilseeds to 25.8 million tonnes (by 4.5 million tonnes, +21%); meal, oil-cake, and other high-protein feeds to 101.5 million tonnes (by 10.5 million tonnes, + 11%); vegetable oils to 93.5 million tonnes (by 9.3 million tonnes, +11%); beef to 14.2 million tonnes in carcass weight equivalent (by 1.71 million tonnes, +14%); and poultry meat to 16.1 million tonnes (by 2.3 million tonnes, +16%). Global imports are expected to decrease only for pork to 10.8 million tonnes (by 1.2 million tonnes, or 10%).

↓ **Table 7. Physical Volumes of Exports of Agro-Industrial Products from the Eurasian Region to Selected Countries, 2035, and their Growth against the Average of 2019–2021 (in parentheses) (tonnes millions)**

Countries	Wheat	Corn	Other cereals	Rice	Soya beans	Other oilseeds	Protein feeds	Vege-table oils	Bovine meat	Swine meat	Poultry meat
Turkey	6.39 (–0.83)	1.63 (+0.87)	1.55 (+0.74)	0.04 (–0.02)	0.07 (+0.01)	0.22 (–0.09)	0.67 (+0.18)	0.73 (+0.04)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Iran	2.28 (+2.19)	1.52 (+0.26)	1.51 (+0.58)	0.00 (+0.00)	0.01 (+0.00)	0.01 (+0.00)	0.01 (+0.00)	0.81 (+0.39)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Saudi Arabia	1.04 (+0.74)	0.00 (+0.00)	2.05 (+0.33)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.11 (+0.05)	0.01 (+0.01)	0.00 (+0.00)	0.05 (+0.03)
Egypt	9.60 (+2.92)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.04 (+0.03)	0.43 (+0.23)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Nigeria	1.52 (+0.56)	0.08 (+0.08)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Ethiopia	0.21 (+0.09)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
China	1.65 (+1.60)	1.52 (+1.40)	4.47 (+4.37)	0.00 (+0.00)	2.24 (+1.46)	0.65 (+0.61)	0.02 (+0.00)	2.65 (+1.89)	0.34 (+0.33)	0.14 (+0.14)	0.16 (+0.05)
Vietnam	0.86 (+0.47)	0.60 (+0.40)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.01 (+0.00)	0.04 (+0.03)	0.00 (–0.04)	0.05 (+0.03)
India	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	1.52 (+1.21)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Pakistan	0.44 (–0.08)	0.00 (+0.00)	0.01 (+0.01)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Indonesia	1.42 (+1.08)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
South Korea	0.06 (+0.01)	0.30 (–0.01)	0.00 (+0.00)	0.00 (+0.00)	0.01 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Other countries	44.66 (+20.7)	1.98 (+1.11)	4.37 (+1.89)	0.28 (+0.09)	0.27 (+0.04)	1.47 (+0.68)	5.08 (+2.32)	9.07 (+6.34)	0.59 (+0.36)	0.87 (+0.64)	1.75 (+1.43)
Whole world	**70.14 (+29.5)**	**7.64 (+4.11)**	**13.96 (+7.92)**	**0.33 (+0.07)**	**2.60 (+1.51)**	**2.34 (+1.19)**	**5.81 (+2.53)**	**15.34 (+10.2)**	**0.98 (+0.73)**	**1.01 (+0.74)**	**2.01 (+1.55)**

Source: EDB calculations based on data from OECD-FAO, COMTRADE, RF FCS.

The share of the countries of the Eurasian region in total global exports has increased over recent years in the markets for wheat (from 14.8% in 2013–2015 to 21.9% in 2019–2021); vegetable oils (from 3.1% to 6.1%); oilseeds, other than soya beans (from 1.0% to 3.0%); poultry meat (from 1.6% to 3.4%); and swine meat (from 1.2% to 2.2%).

The presence of suppliers from the Eurasian region in the global agri-food market expanded owing to the development of export infrastructure, relatively low sales prices — especially in periods of depreciation of the exchange rates of local currencies of the countries of the Eurasian region — and the fairly high quality of exported products.

The results show that, under the targeted scenario, it would be necessary to increase the share of the countries of the Eurasian region in total global exports: for grain from 11.0% in 2019–2021 to 16.3% in 2035 (including the share in China's imports — from 1.8% to 19.9%, those of Iran from 13.8% to 24.5%); for meat of all types from 2.6% to 9.5% (including the share in China's imports from 1.5% to 11.6%, in Vietnam's imports from 9.2% to 16.3%, in Saudi Arabia's imports from 2.6% to 8.4%); for vegetable oils from 6.1% to 16.1% (including the share in China's imports from 6.7% to 25%, in India's imports from 2.3% to 9.0%, in those of Egypt from 12.8% to 20.8%) (see Annex 22).

These are very tough objectives calling for intensified development of export infrastructure and additional efforts to promote products from the Eurasian region in foreign markets. In general, for all countries of the Eurasian region, the potential volumes of grain exports in 2035 (from the external demand perspective) amount to 92 million tonnes under the scenario considered, those of meat of all types — 4 million tonnes in carcass weight equivalent, and those of vegetable oils — 15 million tonnes. Under the inertial scenario, the required expansion of the share in total global exports is significantly lower: for grain up to 12.4% by 2035, for meat of all types up to 4.3%, and for vegetable oils up to 11.7%. Achieving these objectives is quite realistic even in the context of inertial development of the export infrastructure.

As for other products, the severity of constraints on external demand can be estimated for them based on a comparison of the current and prospective export volumes from the countries of the Eurasian region with the actual volumes of global import, with some adjustment for growth in future. According to FAOSTAT (2022), the global imports of fruit in 2019 amounted to 120.4 million tonnes; vegetables 74.4 million tonnes; sugar 92.2 million tonnes; potatoes 31.9 million tonnes; eggs about 44 billion units; and dairy products 102 million tonnes in terms of milk. If the resource potential of exporting those products from the Eurasian region, which is included in the targeted scenario, is realised, and the capacity of world markets grows at historical rates — in 2015–2019, the growth was 1.3–3.4%, depending on the product — then the share of the countries of the Eurasian region in global exports should grow for dairy products from 5.5% in 2019–2021 to 7.9% in 2035, for fruit from 1.6% to 1.9%, and for vegetables from 5.1% to 5.6%. For sugar, the share will not change (1.3%), while for potatoes and eggs it will decrease — from 3.9% to 2.6% and from 3.8% to 1.6%, respectively.

The share of the countries of the Eurasian region in the total volume of global exports of dairy products, vegetables, and fruit should increase through expanded exports to third countries. Although the corresponding gains in exports from the countries of the Eurasian region are quite modest in the global context, the realisation of that resource potential will be made more difficult due to the short shelf life and special requirements for the transportation of those products, as well as limited access to major sales markets. In particular, European markets will be closed at least in the medium term, and in order to enter the markets of the Persian Gulf or Southeast Asia, it is necessary to build complex and expensive logistics and compete with other more favourably located exporting countries.

It should be noted that the values for 2035 are 10–15% higher than the corresponding estimates of the resource potential of exports from the Eurasian region. This is because external demand and resource potential are aligned for each year of the forecast period, and the highest objectives for expanding the share of the countries in the Eurasian region in total volumes of global imports under the targeted scenario emerged in the middle of that period. At the same time, in estimating external demand, it is assumed that the shares achieved would not decrease. Therefore, while the export potential growth decelerates slightly and the growth rate of foreign market capacity remains unchanged in subsequent years, a certain "reserve" of external demand was formed. In other words, the capacity of foreign markets acts here as the upper limit, and the actual export volumes correspond to the realised resource potential.

3.3. Macroeconomic effects of realizing the production-resource potential of the agro-industrial complex of the Eurasian region

Realisation of the resource potential of agri-food production will have both positive effects in terms of ensuring food security within the Eurasian region and the whole world and significant social and economic effects. Expanded agricultural production generates additional demand for products of related sectors for production purposes, which would boost their output — and, thus, their costs of current consumption for production purposes, — transmitting the impulse further along the chain of cross-sector cooperation.

In addition, an increase in the output in agriculture and other sectors directly or indirectly related to agriculture, also leads to higher incomes of workers in those sectors, as well as incomes of the government and businesses (in the form of salaries and wages, taxes, and profits). That additional income spent for consumer and investment purposes will generate additional final demand in the economy and, thus, boost output in sectors producing consumer and investment products. This, in turn, should launch new chains of cross-sector interactions and lead to an increase in output, value added, and other macroeconomic indicators across a wide range of sectors.

According to the estimates we obtained (see Annexes 24 and 25), if the production potential of the Eurasian region is realised, agricultural output is expected to increase from USD 146.7 billion (at 2020 prices) in 2021 to USD 175.9 billion in 2035 under the inertial scenario and to USD 205.8 billion in 2035 under the targeted scenario. In this case, gross output in the economy should increase by an additional USD 55.2 and USD 111.8 billion, respectively, and GDP by USD 28.8 billion and USD 58.1 billion.

Box 5. Production Multipliers

Multipliers are coefficients that show by how much gross output, agricultural output (taking into account indirect effects), and GDP should grow in a given country with an initial increase in output by one unit in a given sector (in this case, agriculture). The multipliers take into account direct effects (generated immediately by the initial increase in output in the sector under consideration), indirect effects (generated by an increase in output in sectors, directly or indirectly supplying inputs for current production in agriculture), and induced effects (of spending additional incomes of households, government, and businesses received in the form of salaries and wages, taxes, and profits generated by direct and indirect effects in agriculture and related sectors).

With an increase in exports of agricultural products, whether in unprocessed or processed form, from the countries of the Eurasian region by USD 12.2 billion under the inertial scenario and by USD 21.6 billion under the targeted scenario, gross output should increase by USD 30.7 and USD 54.3 billion and GDP by USD 15.5 billion and USD 27.4 billion, respectively.

Thus, realisation of the existing resource potential for production growth and exports of agro-industrial products will generate significant positive effects for many non-agricultural sectors — both directly related to the agro-industrial complex and ensuring the overall functioning of the economy.

3.4. Transport and logistics opportunities for realizing the production and resource potential of the agro-industrial complex in the Eurasian region

The development of exports of agri-food products from the Eurasian region is substantially affected by logistics constraints: administrative, infrastructural, and economic.

Administrative constraints encompass non-harmonised procedures for crossing borders, including transport, customs, sanitary, phytosanitary, and veterinary controls.

Infrastructural constraints include:

- bottlenecks along motorways and railways, at border crossings, as well as underdeveloped roadside infrastructure facilities (petrol stations, service stations, parking lots);
- inaccessibility and unsatisfactory condition of port infrastructure (port elevators, sheltered warehouses and storage sites, transhipment facilities, railway and road access ways);
- lack of wholesale distribution centres, warehouses for agricultural products (linear and hub elevators; vegetable and fruit storage facilities; production facilities for sorting, washing, cutting, freezing, and packaging of agricultural products); and
- shortage of modern rolling stock for the transportation of agricultural products, including refrigerated vehicles, carriages and containers, tanks for transporting vegetable oil, etc.

Depending on the requirements for their storage and transportation, food products can be grouped into the following categories: commodities (grain, oilseeds); perishable products (vegetables, fruit, dairy products); and semi-finished and preserved products. Fresh products are the most sensitive because they require prompt delivery and careful packaging. Raw materials and preserved products allow for longer storage and the use of rolling stock not equipped for special transportation conditions.

The key economic constraints include:

- sanctions by the "collective West" against Russia related to payments for export-import operations, freight and insurance for the transportation of agri-food products, as well as direct formal and informal bans and restrictions;
- high logistics costs related to transporting agricultural goods from remote regions (a long transport leg, high tariffs for rail and road transportation);

- relatively high tariffs for transhipment of agricultural goods to be exported through Russian ports, as well as for storage of agricultural products (grain, oilseeds, vegetables, fruit);

- inability of small agricultural entities and private farms to form an adequate batch to fill an entire container or carriage, as well as carload shipments instead of fixed-route transportation of goods; and

- technological constraints (lag in the development of modern technologies for ripening, freezing, long-term storage, and sealing of goods).

The losses of domestic agricultural products due to underdeveloped logistics and storage systems within the countries of the Eurasian region reach 40%. As a result, about 70% of food that could be produced in there is imported from third countries.

At present, a large portion of agro-industrial products (mainly grain, vegetable oils, meal) are exported from the countries of the Eurasian region through the Russian ports of the Azov–Black Sea basin, as well as — in significantly smaller volumes — through the ports of the Caspian and Baltic Seas. Among the factors hindering exports in that area are constraints related to the capacity of port warehouses and the capacity for transhipment of bulk cargo. The shortage of port infrastructure both limits physical exports and determines the high cost of port services, which reduces the margins of exports for traders and agricultural producers. For example, in 2018, logistics costs of Russian grain exporters were, on average, twice as high as those of other major global exporters (Gopkalo, 2020).

Nevertheless, port infrastructure has developed actively over recent years through the construction of new and expansion of existing terminals in ports. It boosts competition in this segment and gradually reduces transhipment tariffs. The list presented in Box 6 includes only some of the projects that, if implemented over the next four years and used at full capacity, could double the current export potential (Ukhabov, 2021). There are reasons to believe that constraints related to port facilities will not be a factor limiting food exports from the Eurasian region.

Box 6. Ongoing Projects to Expand Port Infrastructure

Azov-Black Sea basin:

1. Multimodal transhipment complex for grain and general cargo in the seaport of Azov. Implementation period: 2019–2024. Design capacity of the grain terminal: over 1.5 million tonnes per year (Shokurova, 2021).

2. Grain terminal in the seaport of Taman. Implementation period: 2019–2022. Design capacity: 5.5 million tonnes per year (Demetra-Holding, 2022).

3. Terminal for agricultural bulk and liquid cargo transhipment in the seaport of Taman (Krasnodar Krai). Implementation period: 2019–2023. Design capacity: up to 12.5 million tonnes of grain and meal per year, as well as 3 million tonnes of vegetable oil (Sukhorukova, Dzyadko, 2019).

4. STEPPE grain terminal in Azov, Rostov Oblast (construction and remodelling). Implementation period: 2019–2022. Design capacity: 4.7 million tonnes per year.

5. Southern Seaport in Azov (modernisation). Implementation period: 2018–2022. Additional capacity: 0.7 million tonnes of grain per year. An addition liquid cargo terminal (including sunflower oil) will be built (GorodN, 2018).

6. Taganrog grain terminal. Implementation period: 2019–2022. Design capacity: 0.3 million tonnes per year (PortNews, 2020).

7. NOVAYA PRISTAN project in the port of Novorossiysk (expansion). Implementation period: 2019–2025. Additional capacity: 11.4 million tonnes per year (Kommersant, 2021b).

Baltic Sea basin:

1. Vysotsky grain terminal. Implementation period: 2021–2024. Design capacity: up to 3.5 million tonnes per year. In 2024, an oil extraction plant is to be commissioned (Vysotsky Grain Terminal, 2022).

2. Primorsk Universal Loading Complex. Implementation period: 2017–2030. Design capacity of the grain terminal: up to 5 million tonnes. (Primorsk Universal Loading Complex, 2022).

3. Ust-Luga universal trading terminal. Implementation period: 2017–2024. Design capacity: 7.0 million tonnes of grain and up to 7.0 million tonnes of general and bulk cargo (Lugaport, 2022).

4. Production and Logistics Complex in Batareynaya Bay, Leningrad Oblast. Implementation period: 2020–2029. Design capacity: 10.4 million tonnes per year.

Caspian Sea basin:

1. Grain terminal in the seaport of Makhachkala. Implementation period: 2020–2023. Design capacity: 1.5 million tonnes per year.

Far East region:

1. A new grain terminal in the port of Vladivostok. Implementation period: 2023. The annual volume of cargo processing will be 0.4–06 million tonnes, and the maximum storage capacity will be 38,000 tonnes.

2. The Big Port of Zarubino (DV Kapital, 2018). Implementation period: 2014–2024. Design capacity: 35 million tonnes of container cargo per year, 10 million tonnes of grain cargo. It is expected that most of the cargo will be re-exported from China.

3. Khabarovsk river port project by Harbin Dongjin Group (AmurMedia, 2019). Implementation period: 2019–2024. Project exports: 20.0 million tonnes of soya beans and silage per year.

4. Bolshoy Kamen Port (Korabel, 2019). Implementation period: 2019–2024. Projected cargo turnover: 3.0 million tonnes per year.

The ports of the Azov-Black Sea and Caspian basins are adjacent to grain-rich regions, which simplifies logistics from field to port. The ports of the Baltic Sea basin and Far East region, on the contrary, are very remote from the main agricultural regions, and favourable global market conditions or favourable tariff conditions for the transportation of goods to those ports may be required to unlock their potential. The demand for ports in the Far East basin is justified by the active development of exports of agro-industrial products to Southeast Asia. At the same time, supplies of agricultural products to the east are currently limited by the capacity of the Baikal-Amur Mainline and Trans-Siberian Railway. At present, most of the train routes are used for coal (Alta-Soft, 2022; Maritime News of Russia, 2022). This reduces the potential margin of food exports.

The bulk of freight traffic of agro-industrial products in the countries of the Eurasian region goes by road. According to experts' estimates, its share exceeds 80%. This is due to the specifics of small-scale production, shortage of specialised railway rolling stock, as well as delivery times. In the future, food exports may grow with the continuing high role for road transport and more container trailers. In addition, the growth rates of container transportation are the highest on routes from China to Europe through Kazakhstan and Russia. One of the first major projects in that area is the Agroexpress Project, under which Russian Railways Logistics will purchase about 1,000 autonomous refrigerated containers by 2026 (Kommersant, 2021a).

The export of agricultural products is facilitated by the development of international transport corridors forming the Eurasian Transport Framework (FRI of the Ministry of Finance of Russia, 2021). These include:

- the routes specified in EEC Order No. 175 "On Approval of the List of Eurasian Transport Corridors and Routes" (EEC, 2021b), including Eurasian unimodal and multimodal railway and auto routes of individual states;
- the Northern and Central Eurasian corridors;
- the North-South International Transport Corridor;
- the Central Asia Regional Economic Cooperation (CAREC) programme motorway corridors; and
- TRACECA (Transport Corridor Europe-Caucasus-Asia).

Those corridors will be used, among other things, for the transportation of agricultural goods. In particular, we can expect an increase in rail traffic along the North-South corridor. According to EDB estimates (Vinokurov, Ahunbaev, Shashkenov et al., 2021), the development of that corridor by 2030 will be able to generate an increase in rail transportation of container cargo by the EAEU countries to/from Azerbaijan, Iran, India, and Pakistan of 245,000–500,000 TEU (4.4–9 million tonnes) (Vinokurov, Ahunbaev, Zaboev, 2022). Grain traffic along the North-South corridor, especially along its Eastern route, may range from 8.7 to 12.8 million tonnes by 2030. This would facilitate the diversification of supply channels and a significant expansion of the geography of exports.

While infrastructure projects implemented over the past 10–15 years in the Azov–Black Sea region — the main source of supplies of grain, oil and fat products, and meal, the key agricultural products exported from the Eurasian region — contributed to eliminating bottlenecks, significantly reducing transhipment costs, and expanding export volumes, there are still infrastructure constraints in the eastward direction or along the North-South corridor (see a detailed list of investment projects in Vinokurov, Ahunbaev, Zaboev et al., 2022). Taking into account the shortfall in transhipment volumes in the Baltic Sea ports, as well

as the need to redirect flows from restricted European markets to alternative destinations, special attention should be paid to infrastructure development projects to support exports of agricultural products to Southeast and South Asia, as well as to the Middle East.

Box 7. Potential Areas for Investment Projects

- Transport and logistics infrastructure development projects (the North-South corridor, terminals in the Far East, on the Caspian Sea and the Baltic Sea, hub and linear elevators, wholesale distribution centres, etc.).
- Storage infrastructure development projects (silos in consumer regions, vegetable storage facilities, fruit storage facilities, etc.).
- Projects to develop the domestic technological base for the agro-industrial complex (agricultural science, selective breeding, seed production, pedigree livestock breeding, production of complex fertilizers, veterinary drugs, feed additives, agricultural machine building).
- Import substitution projects in mechanical engineering (commercial fleet building, production of containers, refrigerator carriages, etc.).

An important area is the development of a network of hub and linear elevators and the expansion of the practice of fixed-route transportation of grain and other agricultural goods (instead of carload shipments), as well as the development of container transportation. It would significantly reduce transportation costs for grain traffic from regions located far from domestic and external consumers, and, thus, enhance the competitiveness of agricultural producers from those regions.

For meat exports, gaining access to the markets of China and other major Asian importing countries will be of fundamental importance. One of the key conditions for opening access to those markets is still the normalisation of the epizootic situation in Russia and other countries of the Eurasian region — primarily stopping outbreaks of African swine fever and avian influenza. There are intensive efforts underway in those areas, but the results are still far from what is required.

At the same time, as the infrastructure develops and suppliers from the countries of the Eurasian region enter new foreign markets, exports will create increasing risks to the domestic agri-food market — as a result of a potential reduction in supply due to the outflow of food resources to more profitable export markets — and for domestic production — as a result of potential problems with product sales on foreign markets due to political, logistics, economic, and other constraints. To mitigate the risks, there should be a fairly complex system put in place for state regulation of the domestic market and exports through procurement and commodity interventions, export and import duties, quotas and other mechanisms. It is important to remember that the availability of food and stability of domestic prices for food are the basic elements of national food security, and budget expenditures to ensure the stability of the domestic food market — including procurement interventions — should be considered as payment for the public good.

The creation of modern transport and logistics infrastructure, including facilities for storing, processing, and transhipment of agricultural goods, will be of great importance for exports of agricultural products. An example of such a hub could be the Alatau Industrial Trade and Logistics Complex (ITLC) near the Karasu and Ak-Tilek International Automobile Checkpoints

(IACs) on the border between Kazakhstan and Kyrgyzstan. The IACs are located on busy sections of international motorway routes included in the Europe-Western China highway, TRACECA, and CAREC corridor network, as well as the Bishkek-Almaty Economic Corridor. The conceptual framework of the Alatau ITLC covers construction of modern warehouses for fruit and vegetables in order to develop the processing of agricultural products, as well as expand industrial cooperation between Kazakhstan and the Kyrgyz Republic, with subsequent integration into the EAEU system of international commodity distribution networks.

Accurate planning, delivery times, keeping goods in good condition, payment services, and prompt ordering and return of goods are also of paramount importance. This approach to logistics is based primarily on modern digital technologies and can be implemented by creating a Unified Commodity Distribution Network.

Some infrastructural and administrative constraints can be eased by replacing foreign companies in certain parts of the commodity distribution chain (sea transportation, insurance, financial services). This will require accelerated development of appropriate financial, insurance, and logistics infrastructure, as well as the construction of modern vehicles including a merchant fleet.

3.5. Other Ways to Tap Production and Resource Potential of the Agro-Industrial Complex in the Eurasian Region

Intensification of Agro-Industrial Production

Our results indicate that the Eurasian region has significant production, resource, and export potential, which can be realised both by expanding the sown area and by intensifying agricultural production.

The countries of the Eurasian region, primarily Russia, Kazakhstan, and Uzbekistan, have a high potential to expand their sown area — up to 15–20 million ha in total. The main barrier to realising this potential is that it is mostly concentrated in regions with difficult agro-climatic conditions or severe infrastructure constraints hindering sales of agricultural products on domestic and export markets.

The countries of the region also have great opportunities to intensify their agricultural production and improve land and livestock productivity by increasing the volume of fertilizers, raising the level of mechanisation, automation and digitalization, as well as ensuring more efficient use of water resources in Central Asia. Growth prospects are determined both by the relatively low current technological level of agriculture and by the high output of mineral fertilizers, a key resource for ensuring higher efficiency in crop production.

For example, digitalization in agriculture offers significant potential for development of the agro-industrial complex in the Eurasian region. In Russia, for instance, according to estimates, only 10% of cultivated land uses digital technologies (Golubev, Dayoub, 2022). Precision farming technologies are predominantly used by large agroholdings, while small producers and farms hardly use innovative digital technologies due to their high costs. Similar indicators in developed countries reach 60% in the US and 80% in the European Union. Digitalization technologies in agriculture include high-speed Internet access, monitoring systems (including GPS technologies), video surveillance and control, including the use of unmanned aerial vehicles, automated agricultural machinery, electronic field maps, technologies using big data analysis and neural networks for “smart” fertilization, and more.

Digitalization in agriculture contributes to improving crop yields and livestock productivity. Digital technologies significantly increase competitiveness along the entire agricultural production and supply chain. They allow for optimization and reduction of production costs, and increase profitability, thereby increasing the investment attractiveness of agriculture. At the same time, digitalization allows for increasing labor productivity and safety and reducing the negative impact of agriculture on the environment.

As the resource potential of agriculture aimed at satisfying high domestic demand is realised, overproduction crises might occur. The options for mitigating the impact of the crises could include both stimulation of domestic demand (procurement interventions, targeted social assistance to low-income groups) and the expansion of exports of agro-industrial products. In this case, exports will be a factor ensuring equilibrium in the domestic market.

However, ensuring the national food security should (and will be) the key priority of the agri-food policy of the countries of the Eurasian region. The expansion of agricultural exports can only be considered as an additional objective, which, if achieved, would help realise the existing resource potential to a greater extent — without compromising the food security — and would have a positive impact on overall economic development and the social and economic situation in rural areas.

For Central Asian countries and Russian regions with an arid climate, an important factor of long-term development will be climate change, which can lead to a significant decrease in yields of crops and livestock productivity. The policy of adjusting to the changes, in particular land reclamation and the introduction of moisture-saving technologies, will be of great importance (Vinokurov, Ahunbaev, Usmanov et al., 2021). Institutional changes to the existing mechanisms for regulating the region's water and energy complex can also make a significant contribution to improving the water use efficiency in Central Asia (Vinokurov, Ahunbaev, Usmanov et al., 2022). Effective water management is a key factor in agro-industrial development and, thus, in food security.

Reducing Dependence on Imports of Investment and Intermediate Goods through Technological Modernisation

The agricultural sector of the Eurasian countries is heavily dependent on imports from countries that are imposing sanctions against Russia and Belarus. Western countries supplied agricultural machinery and components (up to 50–100% for certain types), and seeds (in the Russian Federation: 98% for sugar beets; 89% for winter rapeseed; 88% for potatoes; 73% for sunflowers; 58% for corn; and 53% for peas and spring rapeseed). A decrease in imports could lead to a sharp reduction in the sown area and/or lower yields. In animal husbandry, the dependence on imports of hatching eggs and chickens was 95–100% for table poultry and 75–80% for eggs in 2019. The share of imports was also high for breeding stock and pedigree material, equipment for animal husbandry, feed additives, and veterinary drugs.

Russia and Belarus face additional problems in the development of agriculture due to sanctions pressure. In particular, this concerns restrictions on imports of modern agricultural technologies and critical inputs for the agro-industrial complex — seeds; hatching eggs and day-old chickens for parent herds; breeding stock; feed additives; veterinary drugs; complex fertilizers and plant protection products; certain types of agricultural machinery and equipment; spare parts; packaging, etc. In the future, these restrictions will both slow the pace of technological modernisation of agriculture and pose risks of a technological throwback and a decline in agricultural production.

This can be addressed through technological modernisation of processing industries within the agro-industrial complex and related industries, utilisation of the production, scientific,

and technical potential, as well as the tools of state support. In order to prevent a substantial drop in output in the near future (2023–2024), it is essential to secure uninterrupted supply of scarce materials to the region. To address the problem in the long term, there should be a particular focus on accelerated development of the science and technology base of the agricultural sector; promotion of selective breeding and genetics, seed production and pedigree livestock breeding; and import substitution in some vital areas of agricultural machine building. This will help the countries of the Eurasian region maintain the technological level of existing enterprises and ensure the implementation of new projects in the agro-industrial complex, as well as organise technology transfer within the region.

Due to the focus on foreign producers and the degradation of post-Soviet science in the 1990s, there is a scarcity of competitive locally produced source materials for many species of cultivated plants and farm animals, with obsolete and far from optimal varieties prevailing. The available results of developments in this area fail to perfectly satisfy agricultural producers, since they do not fully meet market requirements for certain characteristics and their economic balance. This is partly a consequence of the Soviet model of selective breeding and genetics development, aimed at maximum versatility of a variety at the expense of other characteristics, including productivity. Foreign selective breeding, on the contrary, focuses on ease of production and use of ready-made solutions integrated into production processes, including clearly described procedures and necessary materials (for example, in the case of agricultural crops: the equipment to be used to cultivate the soil; the range of soil cultivation; the seeding depth; the fertilizers to be used; etc.).

If these objectives are successfully achieved, resource potential will be created to maintain the historical trends of intensification and growth of agricultural production in the countries of the Eurasian region.

The strategic priority themes could include:

- development of selective breeding and seed centres (for sugar beet seeds and other crops) and selective breeding and nursery centres for fruit and berry crops (for planting materials). It is possible to utilise the tools offered by the EDB Technical Assistance Fund to cooperate with research institutes and research and technical institutes of agriculture, major producers of poultry meat and hatching eggs, etc.;

- creation of Eurasian clusters in the area of applied genetics and mass cattle reproduction in cooperation with laboratory centres for livestock reproduction;

- production of equipment for animal husbandry with an option of leasing (machines, milking equipment, equipment for feeding, watering, maintaining the microclimate, etc.) for poultry farming, pig breeding, and dairy cattle breeding, including high-tech segments, with intensive use of digital technologies, automation, and robotics;

- development of selective breeding and genetic centres for the production of fish seed material, as well as production facilities for processing fish and seafood throughout the Eurasian region (for example, salmon, sturgeon);

- development of producers in the Eurasian region of innovative highly effective feed components, amino acids, vitamins, and premixes;

- production of veterinary drugs: chemically synthesised pharmaceutical substances for the production of veterinary and medical drugs; SPF (specified pathogen-free) eggs in order to provide raw materials and ensure import substitution for antiviral vaccines; development of innovative new generation pharmacological drugs for veterinary use;

- development of appropriate transport, storage, and refrigeration infrastructure and adequate technical equipment for freight forwarders, etc. (purchase of an additional fleet of refrigerated containers); and

- development of "cold" container services (express trains) on routes from the ports of the Far East to the countries of the Eurasian region.

Many of these directions were addressed by the EEC within the framework of the Agroindustry Development Map (EEC, 2022a).

Supporting Major Local Food Producers and Promoting Cooperation among Small Farms

The global food market is quite concentrated, with a few key players that are large corporations, such as Nestlé, PepsiCo, Danone, Kraft Heinz, and Mondelez International. At the same time, a significant part of food in the Eurasian region is produced by small farms, which creates the problem of a high share of small-scale production.

To compete successfully on the global market, it is necessary to promote the development of major domestic players and their transformation into vertically integrated groups. International practice offers a number of successful cases when support measures in the agro-industrial complex, provided in the framework of a cluster, incubator, or innovation ecosystem, contributed to a significant increase in output and exports within a fairly short period of time (for example, the avocado cluster in Chile, the coffee cluster in Brazil, the wine cluster in California).

The presence of major players in agribusiness will contribute to higher productivity and increase the competitiveness of food produced in the Eurasian region on export markets. The engagement of major players will significantly simplify the development of a commodity distribution network in the region, as it will be much easier for them to build a network of logistics centres and saturate the industry with a fleet of modern vehicles. For example, practical experience shows that large retailers are the most successful in developing such networks. The lack of necessary infrastructure pushes these players towards vertically integrated structures. Retailers contribute to the development of production and mutual trade (through efficient internal logistics, technical quality standards, requirements for volumes and regularity of supplies, etc.), as well as to ensuring physical access (development of distribution networks) and economic access (broader opportunities for price restraint and stabilization) to quality food for the population. This will also create opportunities for the use of more effective financing instruments, including through the involvement of international development institutions, notably the EDB.

This will also make it possible to introduce incentives targeted at developing an "economic infrastructure" and a "knowledge infrastructure" for national brands to be able to develop successfully and intensively. "Economic infrastructure" includes a market mechanism that would protect national brands from foreign competition for a brief period of time, subsidise research and development costs, and fund procurement. "Knowledge infrastructure" includes increasing the requirements of the primary and secondary education system for the entire population, vocational and tertiary education, as well as continuing professional training. Scientists, technologists, and engineers should be trained in the Eurasian region to engage in high-quality research and development for national brands to be able to compete globally in terms of both price and quality.

It is advisable to stimulate international scientific and technical cooperation between leading agricultural enterprises, for example, at the level of the Shanghai Cooperation Organisation

(SCO). Integration within the SCO could expand the access of players from the Eurasian region to the markets of China and Southeast Asia. It will also facilitate the transfer of new agricultural technologies from those countries.

Box 8. FONTAGRO Cooperation Mechanism

FONTAGRO is a cooperation mechanism among Latin America and Caribbean countries and Spain that promotes innovation in family farming. Established in 1998, FONTAGRO has 15 member countries, which have contributed USD 100 million. The fund's sponsors include: the Inter-American Development Bank (IDB), which provides legal, administrative, and technical support; and the Inter-American Institute for Cooperation on Agriculture (IICA), which provides technical and strategic support. The main strategic themes are: technological, organisational, and institutional innovations; adaptation to and mitigation of climate change; sustainable intensification of agriculture and natural resource management; competitive territories and value chains.

An important role in the region's agricultural sector is also played by traders, including large international traders, who can often buy several future harvests from producers in advance. To compete successfully on world markets, it is essential to develop both major domestic food producers and companies engaged in food transportation, storage, trading, and export logistics.

However, the emergence of major and effective market players is a challenge and can take considerable time, especially in the Central Asian countries and Armenia. This is supported by the fact that there are multiple problems in some sectors of Russia's agro-industrial complex in the process of forming large agricultural holdings, among other things as a result of the withdrawal from the market of small and medium-sized producers due to the lack of access to state support. In this context, creating incentives for cooperation among small farms should be a priority. Cooperation can be developed through construction of special institutions, which would help mitigate the problem of small-scale production, for example, through: the formation of an effective procurement system for agricultural products; networks of machine and tractor depots, service and procurement centres, etc. Based on the example of the FONTAGRO cooperation mechanism in Latin America, consideration could be given to establishing a Regional Agricultural Technology Fund that would promote the development and application of agricultural technologies by private farms.

Lifting Barriers and Constraints within the EAEU

A common agricultural market is being formed within the framework of the EAEU. The goals, objectives, and mechanisms for conducting a coordinated agro-industrial policy by the EAEU member states are established by the EAEU Treaty. The main goal is to realize the resource potential of the member states to optimize the volume of production of agricultural products and food, meet the needs of the common agricultural market, and increase exports (EEC, 2014).

Food security is a component of a coordinated agro-industrial policy. In 2021, the EAEU approved common principles and approaches to ensuring food security (EEC, 2021a). Among them are the inadmissibility of discrimination on the common agricultural market of the EAEU, the combination of the national interests of the member states and the goals of the Union. To realize the potential for mutual trade in agricultural products, mutual supplies are provided in case of shortages, as well as assistance in creating favorable conditions for storage, distribution, and consumption of goods.

However, some countries of the Eurasian region (Belarus, Uzbekistan, Kazakhstan) face additional risks to their domestic agricultural production due to other countries' import substitution trends and policies, which are observed in all countries of the Eurasian region. In the absence of a unified food security policy, internal trade barriers arise to ensure national interests.

The past practice of regulating mutual trade in agro-industrial products within the EAEU shows that the approved principles of economic integration are not always implemented by the Union member countries if the principles are not aligned with their national interests. The practice of unilateral restrictions within the Union creates risks and mutual distrust, stimulating member countries' aspiration for food self-sufficiency. For example, the restrictions on exporting agro-industrial products imposed by Russia to ensure national food security during the COVID-19 pandemic and later during 2022 are sensitive matters and affect the development of the export potential of the agro-industrial complex in the Eurasian region. An example of such deviations from integration principles is Russia's ban on grain exports to the EAEU countries, which was in effect from March to June 2022 and aimed at preventing re-export to third countries and protecting domestic consumers from rising grain prices (Interfax, 2022).

As at 23 August 2022, 48 disincentives in the domestic market were recorded in the EEC register — 12 barriers and 36 restrictions (EEC, 2022c). Mutual trade in agro-industrial goods is also hampered by a number of disincentives in technical regulation, transport policy, public procurement, and tax policy, applicable to various products. These include a lack of mutual recognition of digital signatures, and differences in the procedure for issuing special permits for the movement of large and heavy vehicles. According to EDB experts' estimates (Vinokurov, Demidenko, Movchan et al., 2015), non-tariff barriers (NTBs) in mutual trade "steal" 15–30% of the export value. NTBs are called "sand in the wheels" because they impede the movement of goods. Some of them (in particular, measures that affect pricing or restrict competition) could be completely eliminated, which would make it easier for goods to enter the common market (Vinokurov, Demidenko, Pelipas et al., 2015) and would contribute to realisation of export potential.

To reduce inconsistency in the actions of the EAEU countries, a framework document had to be adopted. In June 2022, the heads of government of the EAEU countries defined the rules for the functioning of a single market for sensitive products, including such agricultural products as wheat and rye flour, barley, corn, sunflower seeds, sugar, and sunflower oil. The document establishes free circulation of these goods in mutual trade within approved indicative balances (EEC, 2022d). The rules will help reduce risks for exporters and increase the reliability of supplies for importers within the EAEU and are a step towards forming collective food security.

Joint cross-border projects contribute to the development of mutual trade in agricultural products in the EAEU, Tajikistan, and Uzbekistan. One such project is the "Eurasian Agroexpress," which is aimed at accelerated rail and multimodal transport of agricultural products and food within the union and along two export routes (to China and Uzbekistan), with the possibility of further expansion to other countries. A modern fleet of autonomous refrigerated containers allows transportation of a wide range of goods that require temperature maintenance, with the possibility of online cargo tracking (EEC, 2022b). The first successful shipments of agricultural products with Uzbekistan were implemented in 2021. Russia delivered frozen poultry to Uzbekistan, and Uzbekistan supplied fruits and vegetables (grapes, persimmons, tomatoes, and lemons) under the project (Sputnik Uzbekistan, 2021). Grain, dairy, and meat products are delivered to China via the route. According to REC information, the plans for development include scaling the project to CIS countries (including Tajikistan) and the Asia Pacific Region (Potaeva, Burlakova, 2022).

Developing mutual trade with the EAEU makes it possible, first, to build partnerships within the Union and, second, to focus efforts not on achieving food independence but on improving the affordability and availability of food, including by expanding supplies from neighbouring countries.

Softening competition among countries in the region

Projections show that, despite the significant growth potential for domestic consumption, competition between producers within the Eurasian region may intensify in the future in the markets for grain, dairy products, meat, vegetables, and fruit. Under these conditions, countries with a large national market (Russia, Kazakhstan, Uzbekistan) could pursue relatively soft import regulation policies, focusing on those sectors of agriculture that have the greatest prospects of exporting to third countries.

In this context, the countries of the Eurasian region might also consider additional measures to ease export restrictions and ensure national food security through alternative mechanisms, for example, through the formation of reserves and commodity interventions, and targeted social assistance.

In the long term, one possible solution for resolving the most acute issues affecting the most significant volume of competing products between Russia and Kazakhstan could be the creation of a grain pool. This would enable the coordination of efforts for grain exports, which would make it possible to save on internal grain movements, especially since the majority of grain exports are shipped through Russian ports. By saving on logistics, pool participants could offer a competitive price in the external market. Common rules need to be developed to eliminate competition between countries and price losses compared to what competitors charge (Zlochevsky et al., 2012).

Creating a grain pool will facilitate solving problems that traders cannot handle independently, but that policymakers can. This concerns the unification of rules that exist on national territories, as well as a unified policy conducted by states in external markets. By creating this pool, negotiating efforts can be combined. This is a task for states, not companies. Countries must protect their interests in external markets. The creation of a grain pool may be based primarily on the unification of trade rules and state policies regarding grain exports in these countries.

Unified rules of operation mainly concern logistics, in which each country applies different tools today. It would be expedient to compile a list of priority parameters of a unified policy, and for each item, to find optimal, unified conditions for all pool participants. Another option for interaction could be mutual grain supplies. If such agreements are reached, it would be possible to re-export Kazakhstan's grain resources, and replenish the needs of the domestic market with those from Russia. This would significantly save on transportation costs.

One of the goals of the pool could be the complementary use of existing potentials (production, logistics, the combination of wheat quality from different countries), and savings on this basis on investments in expensive infrastructure projects. In the future, tested practices can be extended to other types of food products.

Development of financial infrastructure

Another important area is accelerated enhancement of the unified financial infrastructure to support the agro-industrial sector (including the development of mutual settlements in

local currencies), creation of a unified insurance and reinsurance infrastructure to support export operations, etc.

Increasing the role of regional commodity exchanges will contribute to the acceleration of development in this direction. International commodity exchanges are used to establish and regulate prices on global commodity markets. Nearly all international trade in grain, coffee, cocoa beans, natural rubber, and other such commodities is based on exchange quotations. Exchange prices serve as benchmarks for setting prices in non-exchange trading, and exchange operations are actively used to hedge trade deals and raw material stocks against changes in market prices (Maqsimchook, Sterligova, 2013). Each exchange commodity, its production and trade, falls under international target regulation. The aim of such regulation is to solve the problems of balanced production, normalization of international commodity trade through coordination of production, consumption, marketing policies, and stabilization of sharp fluctuations in world prices.

Commodity exchanges are an integral part of the production and financial operations of a large number of economic entities. The development of the commodity exchange market "boosts" the formation of the market's institutional infrastructure, including exchange infrastructure, credit relations and the banking system, the system of commercial risk insurance, clearing and settlement systems, a legal framework for new economic relations, etc. (UNCTAD, 2007). Commodity exchanges promote trade and can stimulate growth in developing countries' commodity sectors by reducing transaction costs in the commodity supply chain. Commodity exchange activity contributes to the development of related sectors. For example, the development of a network of commodity warehouses with the aim of improving supply efficiency and credit management systems can have a positive impact on the condition of storage and logistics infrastructure for traded goods. A reliable credit collateral system, especially the use of warehouse receipts, in turn, reduces the risks for banks of lending to agricultural producers and increases the attractiveness of commodity financing as a credit tool. In many developing countries, the use of exchange mechanisms has also contributed to the wider involvement in economic relations of previously isolated participants in the commodity sector.

Commodity exchanges operate in both open and closed economies. Some were created during economic reforms, while others were established during political transformations and the transition to a market economy. Exchanges exist in countries where small household production is the predominant mode, as well as in systems that combine large-scale commercial production and small producers. In some countries, exchanges serve domestic trade, while in others, they serve trade in exported goods.

It would be advisable to systematically develop a comprehensive model of the general commodity market for the countries of the Eurasian region, based on common principles of functioning and regulation in the admission of professional participants, requirements for trade organization and exchange assets, ensuring information transparency, guarantees of performance of obligations under transactions, and risk management. The necessary level of unification of the corresponding legislation of the countries may require comprehensive work on a large number of issues with the mandatory participation of regulators, trade organizers, governments of the Eurasian countries, and other interested parties.

4. PRINCIPAL ASPECTS OF FOOD POLICY IN THE EURASIAN REGION

In preparing this report, we came to several conclusions that we find vitally important for agri-food policy design in the EAEU countries, Tajikistan, and Uzbekistan.

1. High output of agricultural products is a necessary, although not sufficient, condition for ensuring food security, since it is not a sectoral, but a broader economic phenomenon. For example, there is enough grain (as a basis for the development of animal husbandry) in the Eurasian region to meet the needs of the population of the member countries for meat and processed meat products in accordance with prevailing ideas about rational nutrition. The fact that this is not happening — and that the grain industry in Russia and Kazakhstan is developing through the expansion of exports outside the Eurasian region — indicates that the main problem is lack of sufficient effective demand. Therefore, the improvement of food security in some of its vital aspects should be associated not only with expanded reproduction of the agricultural resource potential, but also with the development of national economies in a way that can ensure higher real household incomes and lower income differentiation, including through active social support measures for low-income groups.

2. Although the development of domestic production of agri-food products in the countries of the Eurasian region through expansion of exports to the world market makes a certain contribution to addressing global food security problems, it does not promote a dramatic improvement of food security in the countries of the region themselves, even based on the conventional criteria of availability and affordability. Since addressing global food security problems cannot be accorded a higher priority than ensuring national food security or that of the Union, this collision carries the inference (arguing "by contradiction") that the target of export orientation in the agro-industrial development in the countries of the Eurasian region is, in fact, associated with other economic policy goals. These include improved incomes from agriculture and sustained employment of rural residents, who are usually among the poorest segments of the population. This is the second important social and economic aspect of interpreting estimates of resource potential. As to exports of agricultural products, national agro-industrial complexes create prerequisites for higher incomes and domestic demand from the rural population. But the export expansion regime is characterised by significant inertia, and may result in constraints on the ability to redistribute supplies from foreign markets to domestic ones in a situation of growing domestic demand.

3. Food security is a public good that comes at a price. The resources available to society at any point in time are not sufficient to achieve the entire range of social and economic development targets and ensure all aspects of security, including food security. Current social and economic policy goals actually compete for limited resources, and the key task of governing institutions is to select priorities and effectively mobilise resources to focus on them. The overall social and economic context serves as a basis for substantiating specific food security policy goals and their quantitative targets (criteria). It includes policies for welfare, incomes, prices and social guarantees, foreign trade, agriculture, and agro-industrial development as a whole. The targets formulated in those areas do not generally constitute a coherent system. In this case, it is a methodological imperative to address the conflicts arising in the context of food security policy design in a constructive manner, taking into account its interdependence with other areas of social and economic policy, and building each specific policy option as a system of clearly formulated compromises.

4. The sanctions pressure on Russia and Belarus could not but affect the availability and affordability of food both in those two countries and in the EAEU as a whole. Russian and Belarusian producers have faced restrictions on imports of key elements of current production inputs; equipment and spare parts; banking, insurance, transport, logistics, repair, and legal services. The new environment calls for critical rethinking of existing approaches to substantiating food security policy priorities in terms of the required level of food independence. It seems relevant to supplement the conventional parameters of food independence (level of food self-sufficiency) with a system of characteristics of production and technological independence of agro-industrial sectors (availability of food that can be produced on the basis of production and technological resources of national and/or Union origin).

5. There are threats to food security in market segments characterised by a high share of imports, as well as in those with high levels of self-sufficiency. For example, in the Russian Federation, one of the sources of risk is exports of grain, oil and fat products, the production of which significantly exceeds the needs of the domestic market. Pricing in those segments of the world market determines the pattern of domestic prices, as well as the cost of feed and livestock products. To minimise the risks of rising food prices due to hikes in export prices for grain, oil and fat products, there should be mechanisms designed and implemented to regulate exports and the domestic market for those products at the national and supranational levels. Such an approach, which seems rational to the national regulator in the context of food security policy, would create problems for expanding trade within the Eurasian region and importing agricultural raw materials and food to cover shortages of domestic supply. To utilise the positive potential of country specialisation and cooperation in the food sector within the Eurasian region, it will be necessary to design and implement specific mechanisms to regulate supplies to various segments of the external market — the market of the countries of the Eurasian region and the markets of third countries.

6. Food security criteria and criteria for other areas of social and economic policy implementation may change in opposite directions as a result of the same actions of the regulator or the same shifts in market conditions. The solution to any food security problems requires benefiting from the opportunities that result from adjustment in agri-food policy and/or other social and economic policy areas. However, that adjustment, in turn, may worsen the conditions for solving food security problems, as well as for developing individual sectors and the national economy as a whole. Thus, there is great interdependence between food security problems and their potential solutions.

7. The initial attractiveness of the concept of "security" should not make any options for its actual achievement in economic policy design and implementation attractive by default. A distinction should be made between the positive theoretical potential of the target of food security and the real multidimensional (mixed) consequences of selecting options for its definition and policy tools for its achievement. The specific historical nature of food security policy is manifested in the way it reflects specific features of social and economic development.

8. Linking the procedures for monitoring the state of food security in terms of assessing the sufficiency of production volumes to the balances of supply and use of agricultural raw materials and food enables a significant improvement in the results obtained and demonstrates their relative nature, as they depend on specifics of the agro-industrial complex and the economy in general. Under this approach, with per capita consumption standards unchanged, estimates of the required volume of production and, therefore, the criteria for "sufficient" production will depend on decisions made by the EAEU member countries regarding their foreign trade in agricultural raw materials and food — including trade within the Union and export expansion to the markets of third countries — and

improvements in the efficiency of agro-industrial sectors. For example, other things being equal, increased exports will promote an increase in what constitute "sufficient" volumes of grain, while greater use of varietal seeds (with a significantly lower seeding rate), higher feed conversion in animal husbandry (at least a relative reduction in feed needs), and the development of transport and storage infrastructure (reduction of losses) will tend to decrease what is required for "sufficient" grain production. This means that, under different policy options for development of the agro-industrial complex in the EAEU member countries, the normative values of production volumes incorporated into the formulas that are used to assess the sufficiency of production may differ in the same years of the future period under consideration and may have different trajectories of change as a natural result of differences in agri-food policy goals and measures, their sequencing, and the resulting changes in balances.

CONCLUSION

The objective of this paper was to analyse the potential of the Eurasian region in ensuring its own food security, import substitution, technological modernisation, expansion of production volumes and mutual trade, as well as promotion of food exports to world food markets.

In preparing the report, we came to the following conclusions:

- The risks associated with global food security have increased significantly around the world. The UN World Food Programme has called 2022 "a year of unprecedented hunger", and the number of hungry people was estimated at 828 million.

- A sharp decline in affordability significantly increases the value of food supplies, placing them on a par with oil, but with more severe consequences for the health and livelihoods of the population in case of scarcity.

- Unlike the world in general, the Eurasian region ensures food security through its domestic production. In 2020, its self-sufficiency for most products exceeded the 80–95% thresholds established for the concept of "food independence".

- In 2021, food production was more than 2.3 times that of 1998 — the point of the lowest food output in the Eurasian region following the collapse of the USSR — and amounted to 643 trillion kcal. In monetary terms, food production increased by a factor of 1.9 during the same period, reaching USD 146.7 billion at 2020 prices.

- At the same time, significant amounts of high-tech resources for crop production and animal husbandry are now being imported into the domestic market of the Eurasian region. In 2021, the EAEU imported USD 6.1 billion worth of materials and equipment — USD 3.8 billion, or 61%, for crop production; USD 1.7 billion, or 46%, for agricultural machinery.

- Cooperation among the countries of the Eurasian region is important to address the issue of food security within the region. Mutual trade has been growing steadily and reached USD 15.4 billion in 2021. The share of mutual exports in total exports of agro-industrial goods amounted to 33.6% in 2021. Over the past 20 years, the volume of mutual exports of agro-industrial goods has increased by a factor of 8.5.

- The Eurasian region has significant untapped natural resource potential. The region is home to 10.1% of the world's agricultural land — 10.6% of its arable land and 9.9% of its permanent pastures and hayfields — and the rate of utilisation of arable land is one of the lowest in the world.

- The countries of the Eurasian region have great opportunities to intensify agricultural production and improve land and livestock productivity. Comparative analysis shows that the yields of most crops are at least 1.5–2 times lower than in developed countries.

- Taking into account the projected increase in the duration of the warm period by an average of 35 days, on condition of sufficient moisture availability, the bioclimatic potential of the agricultural zone in the territory of both Russia and Belarus will expand by 8% by 2041–2060, and by 25% by 2100.

- In the Central Asian countries, temperatures are rising faster than the global average. This entails a likely decrease in river flow and creates risks for agriculture and food security in the region. Drying out of the soil can reduce crop yields by 30–50%.

- The production of food in the Eurasian region until 2035 will be characterised by an average growth rate of 1.5% to 2.5% per year. In terms of energy value, the total food production in the region will increase from 661 trillion kcal on average for 2017–2021, reaching 817 trillion kcal under the inertial scenario and 937 trillion kcal under the targeted scenario in 2035. In monetary terms, food production may increase from USD 146.7 billion (at 2020 prices) in 2021 to USD 175.9 billion in 2035 under the inertial scenario and to USD 205.8 billion under the targeted scenario.

- Scenario-based estimates of consumption of food products in the Eurasian region until 2035 indicate low rates of consumption growth for both the inertial and the targeted scenario: an average of 0.8% and 1.3% per year, respectively. In terms of energy value, food consumption in the region will increase by 66 trillion kcal (by 13% over 15 years) — from 517 trillion kcal on average for 2017–2021 to 583 trillion kcal under the inertial scenario and by 105 trillion kcal (by 20% over 15 years) to 622 trillion kcal under the targeted scenario, respectively, by 2035.

- Moderate growth of domestic food consumption against the background of potentially faster growth of domestic production under both scenarios contributes to an increase in the export potential of the Eurasian region.

- The results obtained indicate an increase in export potential in the Eurasian region under the scenarios considered as a result of domestic production outpacing domestic consumption. By 2035, total exports in terms of energy value may increase compared to 2021 by a factor of 1.5 under the inertial scenario — by 109 trillion kcal, to reach 310 trillion kcal — and by a factor of 1.9 under the targeted scenario — by 174 trillion kcal, to reach 375 trillion kcal.

- In value terms, exports of agricultural raw materials from the countries of the Eurasian region will increase from USD 39.7 billion (at 2020 prices) in 2021 to USD 63.2 billion in 2035 under the inertial scenario and to USD 74.3 billion in 2035 under the targeted scenario. The greatest contribution to the growth of exports of agricultural products in value terms until 2035 should be made by the production and processing of oilseeds and cereal crops, as well as the meat and dairy sectors and — in significantly smaller volumes — by vegetables and fruit.

- In 2021, the actual levels of agricultural production were sufficient to almost completely meet the demand on domestic markets of the Eurasian region, while sustaining relatively high food consumption for a total population of 229 million, and to export food to third countries in quantities sufficient to meet the needs of 155 million people.

- By 2035, the population of the Eurasian region will increase to 238 million, while the population of third countries whose dietary needs are fully met through net exports of agri-food products from the Eurasian region will increase to 268 million under the inertial scenario and to 358 million under the targeted scenario.

- Thus, the total population whose needs are met with agro-industrial products originating from the Eurasian region will increase from 384 million to 506 million and 596 million under the inertial and the targeted scenarios, respectively, or 5–6% of the world's total population.

- If realised, the existing resource potential for expanding the production and exports of agro-industrial products will generate significant positive effects for many non-agricultural sectors. If the production potential of the Eurasian region is tapped, the gross output in the economy as a whole should increase by an additional USD 55.2 under the inertial scenario and USD 111.8 billion under the targeted scenario, and the GDP should grow by USD 28.8 billion and USD 58.1 billion, respectively.

The main barrier to realising the production, resource, and export potential is that it is mostly concentrated in regions with difficult agro-climatic conditions or severe infrastructure constraints hindering sales of agricultural products on domestic and export markets.

To increase the use of the resource potential of extensive and intensive growth, economic prerequisites for balanced development of agricultural production should be put in place, including: removal of transport and logistics constraints; accelerated development of the science and technology base of the region's agricultural sector; promotion of selective breeding, seed production, and pedigree livestock breeding; import substitution in some vital areas of agricultural machine building; promotion of mutual trade; and nurturing major producers and exporters.

The agricultural sector will also have to be reformed to adapt to climate change, including optimisation of the feed supply in animal husbandry and fertilizer application in crop production in line with climate and market conditions, conservation and restoration of soil fertility, the development of precision farming, organic agriculture, water- and resource-saving technologies.

At the same time, ensuring national food security should (and will) remain the main priority of the agro-food policy of the Eurasian countries. Increasing agricultural exports can only be considered as an additional task, the solution of which will allow for a more significant realization of the existing resource potential (without compromising food security) and will have a positive impact on the overall economic dynamics and socio-economic situation in rural areas.

ANNEXES

↓ Annex 1. Evolution of Food Security Concepts (based on materials of the UN FAO and the Committee on World Food Security)

Aspects (dimensions) of food security	"An Introduction to the Basic Concepts of Food Security" (FAO, 2008)	"Food Security and Nutrition: Building a Global Narrative towards 2030", report by the HLPE on Food Security and Nutrition of the Committee on World Food Security (HLPE, 2020)
Availability	Food should be available as a result of production, stock utilisation, or imports	Having the quantity and quality of food sufficient to satisfy the dietary needs of individuals, free from adverse substances, and acceptable within a given culture, supplied through domestic production or imports
Affordability	Food should be affordable, taking into account the purchasing power of household incomes	Having household financial means to acquire nutritious food for an adequate diet at a level to ensure that satisfaction of other basic needs are not compromised; and that adequate food is accessible to everyone, including vulnerable individuals and groups
Utilisation	Food must be processed and stored accordingly, be of good quality and safe for health; nutrition must be balanced	Having an adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met
Stability (reliability)	Food availability should not decline due to adverse weather conditions, political instability, or economic shocks	Having the ability to ensure food security in the event of sudden shocks (e.g. an economic, health, conflict, or climatic crisis) or cyclical events (e.g. seasonal food insecurity)
Agency	–	Individuals or groups having the capacity to act independently to make choices about what they eat, the foods they produce, how that food is produced, processed, and distributed, and to engage in policy processes that shape food systems. The protection of agency requires socio-political systems that uphold governance structures that enable the achievement of FSN for all.
Sustainability	–	Food system practices that contribute to long-term regeneration of natural, social, and economic systems, ensuring the food needs of the present generations are met without compromising the food needs of future generations

↓ **Annex 2. Total Sown Area and Area of Unused Arable Land in Countries of the Eurasian Region (ha millions)**

Area	RA	RB	RK	KR	RF	RT	RUz
Total sown area							
1990	0.44	6.13	35.18	1.29	117.71	0.82	3.90
1995	0.35	6.15	28.68	1.17	102.54	0.76	4.05
2000	0.30	6.15	16.20	1.13	84.67	0.87	3.78
2005	0.33	5.47	18.45	1.13	75.84	0.90	3.65
2010	0.28	5.60	21.44	1.15	74.86	0.84	3.71
2015	0.34	5.87	21.02	1.19	78.63	0.83	3.69
2016	0.35	5.85	21.47	1.19	79.31	0.84	3.71
2017	0.29	5.83	21.84	1.21	80.05	0.84	3.47
2018	0.24	5.81	21.90	1.21	79.63	0.83	3.40
2019	0.23	5.90	22.14	1.22	79.89	0.85	3.31
2020	0.22	5.96	22.58	1.22	79.95	0.86	3.40
2021	0.22	5.86	22.93	1.23	80.44	0.86	3.26
Maximum sown area in 1990–2021	0.44 (1990)	6.21 (1997)	35.18 (1990)	1.29 (1990)	117.71 (1990)	0.91 (2004)	4.22 (1997)
Area of unused arable land	0.20 (2018)	0.40* (2020)	3.37** (2015)	0.05 (2021)	18.80 (2021)	n/a	n/a
Total arable land	0.45 (2018)	5.66 (2020)	26.32 (2020)	1.29 (2021)	116.44 (2021)	0.84 (2020)	4.02 (2020)

Notes: * for Belarus, the area of unused agricultural land in general (not only arable land);

** for Kazakhstan, the area of unused and vacant arable land (0.94 and 2.43 million ha, respectively).

Sources: data of national statistical offices; FAOSTAT, 2022; Ministry of Agriculture of the Russian Federation, 2022; Government of the Republic of Kazakhstan, 2017; NEMS RB, 2021.

↓ Annex 3. Average Yields of Crops in Countries of the Eurasian Region and Other Countries, 2016–2020 (hwt/ha)

		including:				including:							For reference:	
Countries	Cereal crops	Wheat	Barley	Corn	Oilseeds	Sunflower seeds	Soya beans	Rapeseed	Sugar beets	Potatoes	Vegetables	Melons and gourds	*Application of mineral fertilizers (kg per ha of arable land)*	*Irrigated land (% of farmland area)*
Armenia	23.3	25.8	20.4	54.9	–	–	–	–	157.8	205.5	309.0	309.4	*201.8*	*18%*
Belarus	31.0	33.8	27.9	–	15.9	–	–	15.9	478.4	216.4	293.9	–	*153.1*	*0%*
Kazakhstan	12.8	11.7	14.6	57.5	10.0	10.1	20.7	10.6	291.3	198.0	269.9	227.8	*4.3*	*6%*
Kyrgyzstan	28.0	24.6	22.5	52.2	20.3	12.8	18.3	–	498.1	171.6	210.8	224.2	*16.4*	*69%*
Russia	26.5	27.9	23.1	49.3	14.2	15.4	14.1	13.8	424.5	165.1	259.2	130.1	*21.2*	*4%*
Tajikistan	36.1	38.4	19.0	61.9	12.2	26.0	–	–	–	201.0	274.7	315.2	*37.7*	*63%*
Uzbekistan	45.5	44.9	14.4	104.8	13.5	39.1	–	–	–	341.7	483.4	449.1	*231.3*	*83%*
USA	82.5	33.3	41.3	110.4	32.5	18.9	33.5	20.0	688.2	496.6	358.1	422.5	*124.9*	*3%*
Canada	40.7	34.3	37.5	96.8	23.7	21.3	28.7	23.2	728.9	385.4	249.7	470.8	*109.6*	*1%*
France	67.4	67.5	60.4	87.2	28.6	22.7	25.6	32.2	820.3	87.2	222.9	188.3	*158.9*	*n/a*
Germany	69.4	74.3	65.2	93.4	32.7	20.5	28.4	33.4	736.4	416.9	319.5	–	*172.9*	*3%*
Italy	54.2	39.4	40.8	102.9	23.1	23.8	36.6	27.1	621.8	286.4	297.9	456.6	96.5	*20%*
Spain	37.6	34.5	33.1	117.1	25.5	12.2	30.0	22.3	884.2	315.6	398.9	558.4	*111.2*	*14%*
Israel	35.9	22.3	21.1	227.7	27.4	51.6	–	–	621.8	286.4	297.9	456.6	*175.9*	*38%*
Australia	20.4	19.3	22.4	67.8	17.3	9.9	14.2	12.8	–	393.9	255.1	413.6	*85.7*	*4%*
China	61.6	55.3	35.2	61.6	28.6	27.1	19.0	20.2	549.5	184.3	249.8	413.4	*370.9*	*n/a*
India	32.2	33.1	26.8	29.0	15.2	6.9	11.1	13.2	–	227.3	151.2	247.4	*167.5*	*39%*

Source: EDB estimates based on data from national statistical offices and FAOSTAT (2022).

↓ **Annex 4. Area under Basic Crops in Countries of the Eurasian Region, 2035 (ha millions), and Its Growth Relative to the Average of 2017–2021 (in parentheses), under the Inertial Scenario**

Product	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
All crops	0.36 (+50.3%)	5.93 (+1.0%)	25.03 (+12.4%)	1.29 (+5.8%)	81.57 (+2.0%)	0.91 (+7.4%)	2.94 (–12.7)	**118.04 (+3.7%)**
Cereal crops	0.23 (+72.6%)	2.71 (+10.4)	17.23 (+10.5%)	0.68 (+6.7%)	47.53 (+0.9%)	0.34 (–12.8%)	1.55 (–3.9%)	**70.27 (+3.4)**
Wheat	0.11 (+67.7%)	0.68 (–3.5%)	12.73 (+7.3%)	0.20 (–18.8%)	30.56 (+8.0%)	0.15 (–29.1%)	1.20 (–10.4%)	**45.63 (+6.8)**
Barley	0.09 (+77.8%)	0.34 (–21.3%)	3.94 (+49.3%)	0.28 (+35.4%)	7.61 (–9.0%)	0.06 (–17.6%)	0.09 (–2.8%)	**12.41 (+4.7%)**
Corn	0.00 (+60.7%)	0.00 (–)	0.20 (+29.9%)	0.11 (+5.9%)	3.33 (+19.9%)	0.08 (+92.0%)	0.06 (+25.8%)	**3.78 (+21.0%)**
Oilseeds	0.00 (–)	0.58 (+58.6%)	4.65 (+56.5%)	0.03 (–46.5%)	21.56 (+49.3%)	0.28 (+43.8%)	0.84 (–26.7%)	**27.93 (+45.8%)**
Sunflower seeds	0.00 (–)	0.00 (–)	1.06 (+23.6%)	0.00 (–78.0%)	12.25 (+42.3)	0.00 (–53.4%)	0.00 (–67.9%)	**13.32 (+40.3%)**
Sugar beets	0.00 (+0.2%)	0.07 (–28.3%)	0.02 (+25.9%)	0.01 (–10.5%)	1.02 (–5.8%)	0.00 (–)	0.00 (–)	**1.12 (–7.2%)**
Potatoes	0.01 (–37.5%)	0.18 (–33.4%)	0.20 (+6.7%)	0.06 (–19.4%)	0.67 (–46.2%)	0.06 (+23.8%)	0.10 (+12.5%)	**1.29 (–33.7%)**
Vegetables, melons and gourds	0.04 (+43.7%)	0.05 (–21.9%)	0.32 (+24.9%)	0.07 (+7.0%)	0.54 (–16.8%)	0.14 (+35.7%)	0.29 (+8.4%)	**1.44 (+1.2%)**
Fruit and berries	0.06 (+7.6%)	0.07 (–17.5%)	0.07 (–15.8%)	0.06 (+1.0%)	0.57 (+1.8%)	0.17 (+20.8%)	0.46 (–6.8%)	**1.46 (+0.4%)**

Source: EDB estimates.

↓ **Annex 5. Yields of Basic Crops in Countries of the Eurasian Region, 2035 (hwt/ha of sown area), and Their Growth Relative to the Average of 2017–2021 (in parentheses), under the Inertial Scenario**

Product	RA	RB	RK	KR	RF	RT	RUz
Cereal crops	35.6 (+88.9%)	29.7 (–3.0%)	13.2 (+8.2%)	28.8 (+8.8%)	31.5 (+18.8%)	49.5 (+32.0%)	49.9 (+10.3%)
Wheat	40.2 (+90.1%)	32.8 (–2.9%)	12.0 (+7.9%)	24.9 (+9.8%)	32.4 (+16.4%)	47.8 (+18.6%)	49.9 (+12.3%)
Barley	31.3 (+89.7%)	26.9 (–3.1%)	14.5 (+6.4%)	23.4 (+14.3%)	25.7 (+11.0%)	24.3 (+23.6%)	16.3 (+16.4%)
Corn	87.0 (+88.9%)	– (–)	56.7 (+1.6%)	56.2 (+7.0%)	53.1 (+8.1%)	60.0 (+7.1%)	87.2 (–12.8%)
Oilseeds	– (–)	28.8 (+69.7%)	9.0 (–6.6%)	32.6 (+50.0%)	16.9 (+16.9%)	21.3 (+56.3%)	11.5 (–10.6%)
Sunflower seeds	– (–)	– (–)	10.4 (+0.0%)	14.7 (+12.5%)	18.0 (+14.8%)	28.4 (+2.4%)	33.3 (–8.3%)
Sugar beets	148.6 (–1.9%)	496.9 (+3.8%)	389.5 (+37.9%)	621.7 (+36.0%)	435.3 (+5.7%)	– (–)	– (–)
Potatoes	245.1 (+23.1%)	237.7 (+10.8%)	201.1 (+0.0%)	180.9 (+5.0%)	218.7 (+31.7%)	223.7 (+11.1%)	354.8 (+2.3%)
Vegetables, melons and gourds	330.7 (+7.9%)	299.3 (+1.4%)	275.2 (+6.5%)	222.3 (+4.8%)	334.5 (+38.3%)	334.8 (+17.4%)	485.8 (+3.6%)
Fruit and berries	127.5 (+40.0%)	98.2 (+19.7%)	76.1 (+23.0%)	56.4 (+19.1%)	111.8 (+53.1%)	56.5 (+12.3%)	108.1 (+22.5%)

Source: EDB estimates.

↓ **Annex 6. Output of Basic Products of the Agro-Industrial Complex in Countries of the Eurasian Region, 2035 (tonnes millions), and Its Growth Relative to the Average of 2017–2021 (in parentheses), under the Inertial Scenario**

Product	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Grain	0.80 (+224.4%)	8.05 (+6.9%)	22.70 (+19.8%)	1.95 (+16.3%)	149.69 (+19.8%)	1.67 (+15.1%)	7.74 (+6.0%)	**192.61 (+18.8%)**
Oilseeds	0.00 (–)	1.66 (+168.9%)	4.19 (+46.7%)	0.08 (–19.0%)	36.48 (+73.9%)	0.60 (+123.6%)	0.96 (–34.6%)	**43.98 (+67.3%)**
Sugar beets	0.05 (–1.7%)	3.36 (–25.7%)	0.78 (+73.5%)	0.74 (+22.3%)	44.28 (–0.9%)	0.00 (–)	0.00 (–)	**49.22 (–2.2%)**
Potatoes	0.33 (–23.3%)	4.18 (–26.4%)	4.12 (+6.7%)	1.16 (–15.4%)	14.75 (–29.1%)	1.32 (+37.6%)	3.51 (+15.1%)	**29.37 (–18.8%)**
Vegetables, melons and gourds	1.29 (+55.1%)	1.43 (–20.8%)	8.87 (+32.8%)	1.53 (+12.2%)	17.94 (+15.3%)	4.65 (+59.0%)	13.91 (+12.5%)	**49.61 (+19.5%)**
Fruit and berries (including grapes)	0.82 (+50.7%)	0.67 (–1.4%)	0.55 (+42.2%)	0.32 (+20.4%)	6.38 (+55.7%)	0.94 (+35.6%)	4.99 (+14.2%)	**14.68 (+32.9%)**
All types of meat (in carcass weight equivalent)	0.14 (+26.9%)	1.32 (+6.0%)	1.54 (+37.3%)	0.31 (+37.4%)	13.37 (+23.0%)	0.29 (+105.7%)	2.03 (+29.3%)	**19.00 (+24.3%)**
Raw milk	0.9 (+30.3%)	8.94 (+18.7%)	8.78 (+49.6%)	2.20 (+35.0%)	35.46 (+13.2%)	1.45 (+45.0%)	13.42 (+25.5%)	**71.15 (+21.1%)**
Eggs (billion units)	0.82 (+13.9%)	3.68 (+5.6%)	6.23 (+19.2%)	0.75 (+37.6%)	45.86 (+2.2%)	1.62 (+150.1%)	10.33 (+39.2%)	**69.29 (+10.1%)**
Vegetable oils	0.00 (–)	1.14 (+195.9%)	0.55 (+32.4%)	0.01 (–38.1%)	12.44 (+91.3%)	0.06 (+151.9%)	0.15 (–41.7%)	14.34 (+88.8%)
Beet sugar	0.01 (+6.4%)	0.40 (–32.7%)	0.10 (+67.3%)	0.09 (+17.3%)	6.07 (–4.9%)	0.00 (–)	0.00 (–)	**6.66 (–6.4%)**

Source: EDB estimates.

↓ **Annex 7. Area under Basic Crops in Countries of the Eurasian Region, 2035 (ha millions), and Its Growth Relative to the Average of 2017–2021 (in parentheses), under the Targeted Scenario**

Product	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
All crops	0.36 (+50.3%)	5.93 (+1.0%)	26.09 (+17.1%)	1.29 (+5.6%)	81.57 (+2.0%)	0.91 (+7.4%)	3.25 (–3.4%)	**119.4 (+4.9%)**
Cereal crops	0.23 (+72.5)	2.47 (+0.4%)	17.23 (+10.5%)	0.75 (+18.9%)	47.53 (+0.9%)	0.34 (–12.8%)	1.55 (–3.9%)	**70.1 (+3.2%)**
Wheat	0.11 (+67.6%)	0.68 (–2.9%)	12.73 (+7.3%)	0.33 (+32.9%)	30.56 (+8.0%)	0.15 (–29.1%)	1.20 (–10.4%)	**45.7 (+7.1%)**
Barley	0.09 (+77.7%)	0.42 (–3.6%)	3.94 (+49.3%)	0.24 (+15.5%)	7.61 (–8.9%)	0.06 (–17.6%)	0.09 (–2.8%)	**12.4 (+4.9%)**
Corn	0.00 (–)	0.00 (–)	0.20 (+29.9%)	0.11 (+2.5%)	3.33 (+19.9%)	0.08 (+92.0%)	0.06 (+25.8%)	**3.8 (+20.9%)**
Oilseeds	0.00 (–)	0.59 (+62.1%)	6.14 (+107.0%)	0.03 (–32.3%)	21.56 (+49.3%)	0.28 (+43.8)	1.01 (–11.6%)	**29.6 (+54.6%)**
Sunflower seeds	0.00 (–)	0.00 (–)	1.16 (+35.2%)	0.00 (–)	12.25 (+42.3%)	0.00 (–)	0.00 (–)	**13.42 (41.4%)**
Sugar beets	0.00 (+0.2%)	0.10 (+11.2%)	0.03 (+60.6%)	0.02 (+27.3%)	1.02 (–5.8%)	0.00 (–)	0.00 (–)	**1.17 (–3.2%)**
Potatoes	0.01 (–37.5%)	0.13 (–51.7%)	0.21 (+11.4%)	0.07 (–6.7%)	0.67 (–46.2%)	0.06 (23.8%)	0.11 (+25.0%)	**1.27 (–34.6%)**
Vegetables, melons and gourds	0.04 (+43.7%)	0.06 (–9.8%)	0.37 (+41.8%)	0.06 (–0.2%)	0. 54 (–16.8%)	0.17 (+61.7%)	0.31 (+16.9%)	**1.53 (+7.9%)**
Fruit and berries	0.06 (+7.6%)	0.07 (–20.4%)	0.08 (+29.4%)	0.05 –17.9%)	1.13 (+101.4%)	0.17 (+20.8%)	0.46 (–6.8%)	**2.02 (+38.4%)**

Source: EDB estimates.

↓ **Annex 8. Yields of Basic Crops in Countries of the Eurasian Region, 2035 (hwt/ha of sown area), and Their Growth Relative to the Average of 2017–2021 (in parentheses), under the Targeted Scenario**

Product	RA	RB	RK	KR	RF	RT	RUz
Cereal crops	48.0 (+154.7%)	45.9 (+50.1%)	15.1 (+23.9%)	34.9 (+31.9%)	35.3 (+33.1%)	54.3 (+44.7%)	75.0 (+65.9%)
Wheat	54.2 (+156.2%)	50.8 (+50.2%)	13.9 (+25.0%)	36.3 (+60.2%)	36.2 (+30.1%)	54.8 (+36.1%)	74.1 (+66.8%)
Barley	42.3 (+155.8%)	42.5 (+52.9%)	16.4 (+20.4%)	26.3 (+28.6%)	28.7 (+23.8%)	24.3 (+23.6%)	23.4 (+67.0%)
Corn	117.5 (+155.1%)	– (–)	58.6 (+5.0%)	59.9 (+13.9%)	56.9 (+15.8%)	60.0 (+7.1%)	92.9 (–7.1%)
Oilseeds	– (–)	18.0 (+6.0%)	10.3 (+6.1%)	33.3 (+52.9%)	18.8 (+30.2%)	26.3 (+93.3%)	11.8 (–8.4%)
Sunflower seeds	– (–)	– (–)	11.9 (+14.1%)	16.3 (+25.0%)	19.9 (+27.1%)	28.4 (+2.4%)	33.3 (–8.3%)
Sugar beets	148.6 (–1.9%)	555.4 (+16.0%)	389.5 (+37.9%)	691.0 (+51.1%)	452.9 (+10.0%)	– (–)	– (–)
Potatoes	300.3 (+50.8%)	361.6 (+68.7%)	204.7 (+1.7%)	212.0 (+23.0%)	260.4 (+56.8%)	240.1 (+19.3%)	354.8 (+2.3%)
Vegetables, melons and gourds	330.7 (+7.9%)	359.8 (+21.9%)	275.8 (+6.7%)	289.4 (+36.5%)	336.2 (+39.2%)	373.3 (+30.9%)	485.2 (+3.5%)
Fruit and berries	165.4 (+81.6%)	93.9 (+14.4%)	76.2 (+23.1%)	80.9 (+70.9%)	112.2 (+53.6%)	60.7 (+20.6%)	108.1 (+22.5%)

Source: EDB estimates.

↓ **Annex 9. Output of Basic Products of Agro-Industrial Complex in Countries of the Eurasian Region (tonnes millions) and Its Growth Relative to the Average of 2017–2021 (in parentheses), under the Targeted Scenario**

Product	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Grain	1.08 (+337.1%)	11.33 (+50.5%)	25.99 (+37.2%)	2.63 (+57.0%)	167.61 (+34.1%)	1.83 (+26.2%)	11.64 (+59.3%)	**222.1 (+37.0%)**
Oilseeds	0.00 (–)	2.34 (+279.3%)	6.30 (+120.4%)	0.11 (+4.5%)	40.63 (+93.6%)	0.75 (+176.5%)	1.19 (–19.1%)	50.03 (+90.2%)
Sugar beets	0.05 (–1.7%)	4.54 (+0.4%)	1.00 (+121.3%)	1.18 (+93.3%)	46.08 (+3.1%)	0.00 (–)	0.00 (–)	**54.13 (+7.6%)**
Potatoes	0.41 (–6.0%)	4.62 (–18.7%)	4.38 (+13.3%)	1.57 (+14.8%)	17.56 (–15.6%)	1.41 (+47.7%)	3.90 (+27.9%)	**33.85 (–6.4%)**
Vegetables, melons and gourds	1.29 (+55.1%)	1.98 (+10.0%)	10.10 (+51.1%)	1.85 (+36.2%)	18.05 (+16.0%)	6.17 (+111.2%)	14.97 (+21.1%)	**54.41 (+31.0%)**
Fruit and berries (including grapes)	1.06 (+95.5%)	0.62 (–9.1%)	0.62 (+59.2%)	0.38 (+40.3%)	12.67 (+209.2%)	1.01 (+45.6%)	4.99 (+14.2%)	**21.35 (+93.3%)**
All types of meat (in carcass weight equivalent)	0.25 (+133.2%)	1.57 (+26.3%)	1.96 (+75.0%)	0.38 (+67.8%)	15.46 (+42.2%)	0.42 (+191.9%)	2.41 (+53.1%)	**22.45 (+46.8%)**
Raw milk	1.13 (+63.2%)	10.06 (+33.6%)	8.78 (+49.6%)	2.67 (+64.3%)	38.96 (+24.3%)	1.86 (+85.8%)	13.42 (+25.5%)	**76.88 (+30.9%)**
Eggs (units billions)	0.82 (+13.9%)	3.74 (+7.2%)	7.62 (+45.8%)	0.75 (+37.6%)	46.82 (+4.3%)	1.62 (+150.1%)	10.33 (+39.2%)	**71.65 (+13.9%)**
Vegetable oils	0.00 (–100.0%)	1.14 (+195.9%)	0.83 (+98.9%)	0.01 (–20.1%)	13.97 (+114.9%)	0.07 (+211.6%)	0.19 (–27.9%)	**16.20 (+113.3%)**
Beet sugar	0.01 (+6.4%)	0.73 (+23.5%)	0.12 (+113.4%)	0.15 (+85.4%)	6.31 (–1.1%)	0.00 (–)	0.00 (–)	**7.32 (+2.9%)**

Source: EDB estimates.

↓ **Annex 10. Average Per Capita Food Consumption in Countries of the Eurasian Region and Other Countries, 2019 (kg per year)**

Country	Grain products	Potatoes	Vegetables, melons and gourds	Fruit and berries	Meat and meat products	Dairy products	Eggs	Vegetable oils	Sugar
Armenia	164.6	64.2	177.1	94.9	56.3	240.4	237.4	9.6	25.7
Belarus	76.0	161.0	151.7	96.2	97.1	244.8	262.8	17.3	39.7
Kazakhstan	96.4	110.7	230.6	51.4	72.7	232.9	256.6	19.1	26.5
Kyrgyzstan	146.2	116.3	150.7	32.0	39.9	205.7	89.7	9.1	23.7
Russia	116.0	88.8	107.6	61.7	75.7	233.9	285.3	14.0	39.0
Tajikistan	159.1	42.4	190.7	58.4	17.6	87.6	90.7	15.8	15.4
Uzbekistan	186.2	90.9	278.5	98.7	47.1	297.2	193.8	9.2	19.6
USA	109.9	49.6	107.5	106.7	128.4	280.2	245.2	20.0	33.1
Canada	115.9	82.3	101.9	96.8	93.7	236.4	231.6	25.5	34.5
UK	131.8	76.9	79.3	78.8	79.0	268.6	169.3	13.6	29.8
Finland	119.2	58.2	85.1	73.1	72.6	438.4	162.8	2.5	29.1
France	143.9	50.5	96.3	91.2	80.4	326.5	171.2	17.1	35.6
Germany	116.9	64.5	88.5	75.5	76.4	291.5	179.6	16.7	36.7
Poland	149.8	99.4	124.2	61.8	83.8	257.3	102.7	7.3	43.9
Lithuania	146.8	83.8	96.5	47.3	84.0	216.7	176.4	10.3	34.3
Georgia	175.2	42.2	61.4	49.3	35.3	169.8	151.3	8.5	35.6
Azerbaijan	196.4	72.8	184.9	85.5	35.8	223.8	129.3	4.1	19.8
Turkey	204.4	46.8	239.0	128.2	39.2	237.0	143.6	15.5	30.6
Iran	199.9	31.1	138.7	144.2	37.3	78.1	124.3	13.1	27.2
Saudi Arabia	186.9	17.0	70.5	69.7	52.5	69.0	130.1	18.3	30.3
China	201.7	43.7	380.9	102.0	64.4	26.2	310.0	9.3	7.0
India	186.4	26.2	89.2	63.6	5.0	140.8	45.5	9.1	19.6

Sources: for the countries of the Eurasian region — EDB estimates based on data from national statistical offices, the Statistical Committee of the CIS, and FAOSTAT; for other countries — FAOSTAT, 2022.

↓ **Annex 11. Main Quality Characteristics of Regression Models Used for Forecasting Per Capita Food Consumption in Countries of the Eurasian Region**

Product	RA	RB	RK	KR	RF	RT	RUz
Determination coefficients (R^2)							
Grain products	0.73	0.70	0.33	0.43	0.56	0.30	0.48
Potatoes	0.70	0.79	0.20	0.35	0.76	0.56	0.99
Vegetables, melons and gourds	0.77	0.79	0.87	0.50	0.78	0.95	0.95
Fruit and berries	0.65	0.80	0.99	0.96	0.86	0.78	0.97
All types of meat	1.00	0.97	0.87	1.00	0.95	0.94	1.00
Milk	0.81	0.70	0.94	0.71	0.75	0.96	1.00
Eggs	1.00	0.77	0.98	0.85	0.89	0.94	0.99
Vegetable oils	0.93	0.65	0.36	0.65	0.73	0.81	0.09
Sugar	0.35	0.28	0.73	0.82	0.34	0.79	0.81
Mean absolute percentage error (MAPE)							
Grain products	2.8%	3.4%	2.3%	4.5%	0.5%	2.4%	2.4%
Potatoes	5.0%	2.4%	1.6%	5.5%	3.1%	4.7%	2.0%
Vegetables, melons and gourds	3.5%	1.0%	3.0%	4.1%	1.2%	3.8%	3.4%
Fruit and berries	6.9%	7.6%	3.7%	2.9%	1.9%	6.4%	3.0%
All types of meat	0.6%	1.4%	2.7%	0.3%	0.9%	4.6%	0.8%
Milk	2.6%	2.6%	2.5%	0.9%	0.3%	3.2%	0.4%
Eggs	0.7%	2.0%	1.7%	3.0%	0.4%	7.1%	2.8%
Vegetable oils	2.7%	3.7%	5.3%	5.5%	0.9%	3.6%	4.7%
Sugar	5.8%	5.0%	2.0%	8.3%	1.5%	4.1%	1.8%

Source: EDB estimates.

↓ **Annex 12. Average Per Capita Consumption of Basic Food Products in Countries of the Eurasian Region, 2035 (kg per year), and Its Growth Relative to the Average of 2017–2021 (in parentheses), under the Inertial Scenario**

Product	RA	RB	RK	KR	RF	RT	RUz
Grain processing products	160.7 (–0.9%)	75.7 (–2.7%)	93.4 (–5.4%)	146.6 (+0.1%)	113.9 (–2.0%)	164.0 (+0.2%)	184.8 (–0.1%)
Potatoes	52.0 (–16.7%)	152.2 (–5.3%)	110.8 (+0.7%)	107.2 (–2.4%)	73.5 (–16.3%)	49.2 (+14.4%)	105.2 (+17.1%)
Vegetables, melons and gourds	200.6 (+9.7%)	152.5 (+0.9%)	287.3 (+27.5%)	150.1 (–8.3%)	118.6 (+11.8%)	235.8 (+13.8%)	251.3 (–13.9%)
Fruit and berries (including grapes)	132.2 (+37.7%)	95.8 (+2.6%)	43.8 (–18.6%)	25.2 (–21.7%)	78.4 (+27.6%)	66.2 (+5.4%)	93.8 (–8.7%)
Meat and meat products	68.8 (+21.8%)	104.1 (+8.3%)	90.4 (+23.7%)	46.8 (+20.3%)	87.7 (+15.7%)	27.8 (+53.4%)	50.0 (+6.6%)
Dairy products (in terms of milk)	281.3 (+15.5%)	257.1 (+5.4%)	250.7 (+4.5%)	209.5 (+1.3%)	260.1 (+10.7%)	98.1 (+17.7%)	301.2 (+1.6%)
Eggs, units per year	274.6 (+16.6%)	275.0 (+4.9%)	262.1 (+7.3%)	94.5 (+8.1%)	296.1 (+4.4%)	130.4 (+69.6%)	221.6 (+16.2%)
Vegetable oils	0.03 (+16.3%)	0.22 (–2.7%)	0.47 (+22.2%)	0.07 (+12.3%)	4.10 (+9.4%)	0.22 (+42.6%)	0.58 (+10.0%)
Sugar	0.06 (–13.3%)	0.33 (–8.7%)	0.52 (+3.8%)	0.14 (+11.7%)	5.60 (–5.4%)	0.25 (+57.3%)	0.82 (+18.6%)

Source: EDB estimates.

↓ **Annex 13. Domestic Consumption of Basic Products of Agro-Industrial Complex in Countries of the Eurasian Region, 2035 (tonnes millions), and Its Growth Relative to the Average of 2017–2021 (in parentheses), under the Inertial Scenario**

Product	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Grain	0.89 (+10.7%)	9.07 (+13.9%)	15.75 (+16.8%)	2.71 (+30.0%)	88.32 (+11.6%)	3.76 (+52.4%)	12.73 (+32.4%)	**133.25 (+15.3%)**
Potatoes	0.32 (–32.3%)	4.35 (–18.7%)	4.44 (+17.5%)	1.49 (+7.8%)	16.97 (–25.0%)	1.34 (+34.4%)	4.70 (+38.5%)	**33.61 (–11.6%)**
Vegetables, melons and gourds	0.87 (+3.1%)	1.57 (–10.2%)	9.53 (+43.5%)	1.59 (+16.5%)	19.15 (+7.3%)	4.18 (+49.7%)	10.82 (+5.3%)	**47.71 (+14.9%)**
Fruit and berries (including grapes)	0.78 (+50.8%)	1.08 (–6.5%)	1.09 (+0.3%)	0.30 (+6.4%)	13.09 (+26.9%)	0.87 (+41.0%)	4.02 (+11.5%)	**21.23 (+20.8%)**
All types of meat (in carcass weight equivalent)	0.22 (+28.0%)	0.94 (+1.7%)	2.00 (+46.7%)	0.38 (+51.2%)	12.52 (+12.3%)	0.35 (+103.5%)	2.09 (+29.8%)	**18.50 (+18.2%)**
Raw milk	0.90 (+11.8%)	3.00 (–2.4%)	8.52 (+34.2%)	1.95 (+28.8%)	39.79 (+6.3%)	1.57 (+52.7%)	13.53 (+25.5%)	**69.26 (+13.5%)**
Eggs (units billions)	0.84 (+17.2%)	2.74 (–0.2%)	6.46 (+29.2%)	0.79 (+36.4%)	46.60 (+1.2%)	1.63 (+125.4%)	10.25 (+42.7%)	69.45 (+10.3%)
Vegetable oils	0.06 (–13.3%)	0.33 (–8.7%)	0.52 (+3.8%)	0.14 (+11.7%)	5.60 (–5.4%)	0.25 (+57.3%)	0.82 (+18.6%)	**7.73 (–1.3%)**
Sugar	0.03 (+16.3%)	0.22 (–2.7%)	0.47 (+22.2%)	0.07 (+12.3%)	4.10 (+9.4%)	0.22 (+42.6%)	0.58 (+10.0%)	**5.69 (+11.0%)**

Source: EDB estimates.

↓ **Annex 14. Average Per Capita Consumption of Basic Food Products in Countries of the Eurasian Region, 2035 (kg per year), and Its Growth Relative to the Average of 2017–2021 (in parentheses), under the Targeted Scenario**

Product	RA	RB	RK	KR	RF	RT	RUz
Grain processing products	163.5 (+0.8%)	80.4 (+3.3%)	93.5 (–5.3%)	143.7 (–1.9%)	113.3 (–2.5%)	159.6 (–2.5%)	215.9 (+16.7%)
Potatoes	51.8 (–16.9%)	157.0 (–2.3%)	110.5 (+0.4%)	110.0 (+0.2%)	78.2 (–10.9%)	48.3 (+12.3%)	106.2 (+18.2%)
Vegetables, melons and gourds	200.6 (+9.7%)	163.0 (+7.7%)	292.3 (+29.7%)	164.4 (+0.5%)	119.0 (+12.1%)	307.1 (+48.3%)	276.1 (–5.4%)
Fruit and berries (including grapes)	160.8 (+67.5%)	94.9 (+1.6%)	46.0 (–14.5%)	30.3 (–6.1%)	90.6 (+47.5%)	70.1 (+11.6%)	104.9 (+2.1%)
Meat and meat products	88.2 (+56.1%)	116.4 (+21.1%)	103.7 (+42.0%)	50.6 (+29.8%)	90.9 (+20.0%)	33.9 (+86.6%)	58.9 (+25.6%)
Dairy products (in terms of milk)	310.9 (+27.7%)	290.5 (+19.0%)	250.7 (+4.5%)	246.6 (+19.3%)	274.6 (+16.9%)	151.6 (+81.9%)	330.9 (+11.6%)
Eggs, units per year	274.6 (+16.6%)	275.0 (+4.9%)	300.8 (+23.1%)	94.5 (+8.1%)	301.0 (+6.1%)	130.4 (+69.6%)	244.8 (+28.4%)
Sugar	21.7 (–10.5%)	42.4 (+9.4%)	23.4 (–12.9%)	21.0 (+8.9%)	39.3 (–0.5%)	19.9 (+18.1%)	19.7 (–2.9%)
Vegetable oils	11.8 (+20.0%)	18.9 (+7.1%)	22.2 (+6.6%)	8.2 (–8.1%)	15.5 (+10.6%)	16.9 (+4.0%)	9.7 (–4.3%)

Source: EDB estimates.

↓ **Annex 15. Domestic Consumption of Basic Products of Agro-Industrial Complex in Countries of the Eurasian Region, 2035 (tonnes millions), and Its Growth Relative to the Average of 2017–2021 (in parentheses), under the Targeted Scenario**

Product	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Grain	1.09 (+34.7%)	10.26 (+28.9%)	16.08 (+19.3%)	3.02 (+44.8%)	94.88 (+19.9%)	4.41 (+78.7%)	14.86 (+54.5%)	**144.60 (+25.1%)**
Potatoes	0.34 (–26.6%)	4.41 (–17.5%)	4.51 (+19.2%)	1.59 (+15.1%)	18.16 (–19.8%)	1.57 (+57.4%)	4.75 (+40.0%)	**35.34 (–7.0%)**
Vegetables, melons and gourds	0.90 (+7.1%)	1.72 (–1.5%)	9.65 (+45.3%)	1.78 (+30.8%)	19.37 (+8.5%)	5.45 (+95.0%)	11.88 (+15.6%)	**50.75 (+22.2%)**
Fruit and berries (including grapes)	0.98 (+89.6%)	1.05 (–8.8%)	1.15 (+6.2%)	0.35 (+25.5%)	16.73 (+62.1%)	0.92 (+49.4%)	4.50 (+24.6%)	**25.68 (+46.1%)**
All types of meat (in carcass weight equivalent)	0.26 (+52.7%)	1.05 (+13.5%)	2.30 (+68.5%)	0.42 (+63.3%)	13.00 (+16.5%)	0.42 (+147.5%)	2.46 (+52.7%)	**19.90 (+27.2%)**
Raw milk	1.01 (+25.1%)	3.45 (+12.3%)	8.52 (+34.2%)	2.40 (+58.4%)	42.12 (+12.5%)	2.33 (+127.1%)	14.84 (+37.6%)	**74.68 (+22.4%)**
Eggs (units billions)	0.92 (+27.4%)	2.80 (+2.0%)	7.92 (+58.4%)	0.80 (+37.1%)	47.77 (+3.8%)	1.63 (+125.4%)	11.51 (+60.1%)	**73.33 (+16.5%)**
Vegetable oils	0.03 (+16.3%)	0.22 (–2.7%)	0.49 (+26.6%)	0.07 (+15.0%)	4.13 (+10.0%)	0.21 (+38.8%)	0.61 (+15.7%)	**5.76 (+12.2%)**
Sugar	0.06 (–13.3%)	0.38 (+2.5%)	0.51 (+3.5%)	0.17 (+37.4%)	5.59 (–5.6%)	0.25 (+57.3%)	0.82 (+18.6%)	**7.78 (–0.7%)**

Source: EDB estimates.

↓ **Annex 16. Scenario Conditions for Forecasting Per Capita Consumption of Basic Food Products in Countries of the Eurasian Region, 2035, under the Inertial Scenario***

Product	RA	RB	RK	KR	RF	RT	RUz
Population (millions)	2.91	8.87	22.00	8.15	142.25	12.46	41.40
Real household money income index (2021 = 100%)	133.8%	126.8%	187.4%	118.6%	130.9%	145.4%	166.8%
Domestic production (tonnes millions)							
Grain	0.80	8.05	22.70	1.95	149.69	1.67	7.74
Potatoes	0.33	4.18	4.12	1.16	14.75	1.32	3.51
Vegetables, melons and gourds	1.29	1.43	8.87	1.53	17.94	4.65	13.91
Fruit and berries	0.82	0.67	0.55	0.32	6.38	0.94	4.99
Meat of all types (in carcass weight equivalent)	0.14	1.32	1.54	0.31	13.37	0.29	2.03
Raw milk	0.90	8.94	8.78	2.20	35.46	1.45	13.42
Eggs (units billions)	0.82	3.68	6.23	0.75	45.86	1.62	10.33
Beet sugar	0.01	0.40	0.10	0.09	6.07	0.00	0.00
Vegetable oils	0.00	1.14	0.55	0.01	12.44	0.06	0.16
Imports (tonnes millions)							
Grain	–	–	–	–	–	2.10	–
Potatoes	–	–	–	–	–	–	1.20
Fruit and berries	–	0.71	0.79	0.13	–	0.03	–
Meat of all types (in carcass weight equivalent)	0.07	–	–	0.08	–	–	–
Dairy products	0.08	0.10	0.50	0.05	6.91	–	–
Sugar (including cane)	0.06	0.12	–	0.05	–	0.25	0.80
Vegetable oils	0.03	–	0.22	0.06	–	–	–
Exports (tonnes millions)							
Fruit and berries	–	–	–	0.15	–	0.00	–
Meat of all types (in carcass weight equivalent)	–	–	–	0.00	–	–	–
Dairy products	–	6.03	–	0.30	–	–	–

Note: * calculations as at 31 August 2022.

Source: EDB estimates.

↓ **Annex 17. Scenario Conditions for Forecasting Per Capita Consumption of Basic Agro-Industrial Products in Countries of the Eurasian Region, 2035, under the Targeted Scenario***

Product	RA	RB	RK	KR	RF	RT	RUz
Population (millions)	2.91	8.87	22.00	8.15	142.25	12.46	41.40
Real household money income index (2021 = 100%)	133.8%	126.8%	187.4%	118.6%	130.9%	145.4%	166.8%
Domestic production (tonnes millions)							
Grain	1.08	11.33	25.99	2.63	167.61	1.83	14.03
Potatoes	0.41	4.62	4.38	1.57	17.56	1.41	3.90
Vegetables, melons and gourds	1.29	1.98	10.10	1.85	18.05	6.17	14.97
Fruit and berries	1.06	0.62	0.62	0.38	12.67	1.01	5.50
Meat of all types (in carcass weight equivalent)	0.25	1.57	1.96	0.38	15.46	0.42	2.41
Raw milk	1.13	10.06	8.78	2.67	38.96	1.86	14.49
Eggs (units billions)	0.82	3.68	7.62	0.75	46.82	1.62	11.61
Beet sugar	0.01	0.73	0.12	0.15	6.31	0.00	0.00
Vegetable oils	0.00	1.14	0.83	0.01	13.97	0.07	0.22
Imports (tonnes millions)							
Grain	–	–	–	–	–	2.60	–
Potatoes	–	–	–	–	–	–	0.86
Fruit and berries	–	0.71	0.79	0.13	–	0.03	–
Meat of all types (in carcass weight equivalent)	0.01	–	–	0.04	–	–	–
Dairy products	0.02	0.02	0.50	0.03	6.91	–	–
Sugar (including cane)	0.06	0.06	–	0.05	–	0.25	0.80
Vegetable oils	0.03	–	0.22	0.06	–	–	–
Exports (tonnes millions)							
Fruit and berries	–	–	–	0.15	–	0.00	–
Meat of all types (in carcass weight equivalent)	–	–	–	0.00	–	–	–
Dairy products	–	6.63	–	0.30	–	–	–

Note: * calculations as at 31 August 2022.

Source: EDB estimates.

↓ **Annex 18. Resource Potential of Exports of Agro-Industrial Products from the Eurasian Region, 2035, under the Inertial Scenario (tonnes millions), and Its Absolute Increase Compared to the Average of 2019–2021 (in parentheses, tonnes millions)**

Product	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Grain	0.02 (+0.00)	0.08 (+0.01)	7.92 (+1.27)	0.13 (+0.01)	61.54 (+18.01)	0.01 (+0.01)	0.06 (–0.02)	**69.76 (+19.29)**
Potatoes	0.02 (+0.01)	0.02 (–0.42)	0.12 (–0.21)	0.01 (–0.04)	0.25 (–0.18)	0.00 (+0.00)	0.00 (+0.00)	**0.43 (–0.84)**
Vegetables, melons and gourds	0.51 (+0.43)	0.11 (–0.26)	0.29 (–0.15)	0.05 (+0.00)	0.65 (+0.33)	0.50 (+0.40)	3.23 (+0.64)	**5.35 (+1.38)**
Fruit and berries	0.20 (+0.07)	0.30 (+0.01)	0.14 (+0.00)	0.15 (+0.00)	0.38 (+0.12)	0.00 (–0.01)	1.07 (+0.16)	**2.24 (+0.35)**
All types of meat	0.01 (+0.00)	0.42 (+0.03)	0.09 (+0.06)	0.00 (+0.00)	1.28 (+0.73)	0.00 (+0.00)	0.00 (+0.00)	**1.80 (+0.82)**
Dairy products	0.08 (+0.05)	6.03 (+1.30)	0.76 (+0.62)	0.30 (+0.11)	2.59 (+1.87)	0.00 (+0.00)	0.01 (+0.00)	**9.76 (+3.95)**
Eggs (units billions)	0.00 (+0.00)	0.96 (+0.19)	0.08 (–0.21)	0.00 (+0.00)	0.18 (–0.53)	0.00 (+0.00)	0.11 (+0.11)	**1.33 (–0.44)**
Sugar	0.01 (+0.00)	0.19 (–0.18)	0.16 (+0.04)	0.01 (+0.00)	0.63 (–0.08)	0.00 (+0.00)	0.00 (–0.01)	**1.00 (–0.21)**
Vegetable oils	0.00 (+0.00)	1.05 (+0.67)	0.27 (+0.13)	0.00 (+0.00)	9.88 (+5.24)	0.00 (+0.00)	0.01 (–0.01)	**11.22 (+6.04)**

Note: For countries in the Eurasian region, estimates are the sum of exports from all countries under consideration (i.e. they reflect not the total volume of exports of agri-food products to third countries, but total export volumes, taking into account mutual trade among the countries of the Eurasian region).

Source: EDB estimates.

↓ **Annex 19. Resource Potential of Exports of Agro-Industrial Products from the Eurasian Region, 2035, under the Targeted Scenario (tonnes millions), and Its Absolute Increase Compared to the Average of 2019–2021 (in parentheses, tonnes millions)**

Product	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Grain	0.02 (+0.00)	1.18 (+1.10)	10.90 (+4.25)	0.13 (+0.01)	72.91 (+29.37)	0.02 (+0.02)	0.14 (+0.07)	**85.30 (+34.83)**
Potatoes	0.07 (+0.06)	0.23 (–0.22)	0.32 (–0.01)	0.01 (–0.04)	0.25 (–0.18)	0.00 (+0.00)	0.00 (+0.00)	**0.88 (–0.39)**
Vegetables, melons and gourds	0.43 (+0.35)	0.40 (+0.02)	0.68 (+0.23)	0.10 (+0.05)	0.31 (–0.01)	0.77 (+0.67)	3.27 (+0.68)	**5.97 (+2.00)**
Fruit and berries	0.18 (+0.06)	0.27 (–0.02)	0.12 (–0.02)	0.15 (+0.00)	1.03 (+0.76)	0.00 (–0.01)	1.07 (+0.16)	**2.83 (+0.94)**
All types of meat	0.01 (+0.00)	0.53 (+0.14)	0.07 (+0.04)	0.00 (+0.00)	2.72 (+2.17)	0.00 (+0.00)	0.00 (+0.00)	**3.33 (+2.35)**
Dairy products	0.13 (+0.11)	6.63 (+1.89)	0.76 (+0.62)	0.30 (+0.11)	3.75 (+3.04)	0.00 (+0.00)	0.01 (+0.00)	**11.58 (+5.77)**
Eggs (units billions)	0.01 (+0.01)	0.90 (+0.13)	0.46 (+0.18)	0.00 (+0.00)	0.14 (–0.56)	0.00 (+0.00)	0.04 (+0.04)	**1.56 (–0.21)**
Sugar	0.01 (+0.00)	0.42 (+0.06)	0.16 (+0.04)	0.02 (+0.02)	0.89 (+0.18)	0.00 (+0.00)	0.00 (–0.01)	**1.50 (+0.29)**
Vegetable oils	0.00 (+0.00)	1.05 (+0.67)	0.54 (+0.40)	0.00 (+0.00)	11.40 (+6.76)	0.00 (+0.00)	0.02 (+0.00)	**13.01 (+7.83)**

Note: For countries in the Eurasian region, estimates are the sum of exports from all countries under consideration (i.e. they reflect not the total volume of exports of agri-food products to third countries, but total export volumes, taking into account mutual trade between the countries of the Eurasian region).

Source: EDB estimates.

↓ **Annex 20. Resource Potential of Exports of Agro-Industrial Products from Countries of the Eurasian Region, 2035 (tonnes millions)**

Product	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Inertial scenario								
Grain	–0.09	–1.02	6.95	–0.75	61.37	–2.09	–4.99	**59.37**
Potatoes	0.01	–0.16	–0.32	–0.33	–2.22	–0.02	–1.20	**–4.24**
Vegetables, melons and gourds	0.42	–0.14	–0.66	–0.06	–1.22	0.46	3.09	**1.90**
Fruit and berries	0.04	–0.41	–0.65	0.03	–6.71	–0.03	0.97	**–6.77**
All types of meat	–0.06	0.38	–0.48	–0.07	0.85	–0.05	–0.06	**0.50**
Dairy products	0.00	5.94	0.26	0.25	–4.33	–0.12	–0.11	**1.89**
Eggs (units billions)	–0.03	0.94	–0.23	–0.04	–0.74	0.00	0.08	**–0.02**
Sugar	–0.05	0.07	–0.42	–0.04	0.47	–0.25	–0.80	**–1.03**
Vegetable oils	–0.03	0.92	0.06	–0.06	8.33	–0.12	–0.42	**8.67**
Targeted scenario								
Grain	–0.01	1.07	9.91	–0.38	72.73	–2.58	–2.22	**78.53**
Potatoes	0.06	0.21	–0.13	–0.02	–0.60	–0.15	–0.86	**–1.49**
Vegetables, melons and gourds	0.39	0.27	0.45	0.07	–1.32	0.72	3.11	**3.68**
Fruit and berries	0.08	–0.44	–0.67	0.03	–4.06	–0.03	0.97	**–4.11**
All types of meat	–0.01	0.52	–0.36	–0.04	2.47	–0.01	–0.05	**2.53**
Dairy products	0.12	6.61	0.26	0.27	–3.16	–0.48	–0.11	**3.52**
Eggs (units billions)	–0.10	0.88	–0.30	–0.05	–0.95	0.00	–0.17	**–0.69**
Sugar	–0.05	0.36	–0.39	–0.03	0.72	–0.25	–0.80	**–0.44**
Vegetable oils	–0.03	0.92	0.32	–0.06	9.84	–0.11	–0.40	**10.47**

Source: EDB estimates.

↓ **Annex 21. Physical Volume of Imports of Agro-Industrial Products to Selected Countries, 2031 (tonnes millions), and Their Growth against the Average of 2019–2021 (in parentheses, tonnes millions)**

Countries	Wheat	Corn	Other cereals	Rice	Soya beans	Other oilseeds	Protein feeds	Vege-table oils	Bovine meat	Swine meat	Poultry meat
Turkey	8.45 (–1.11)	2.65 (+0.04)	2.02 (+0.56)	0.25 (–0.03)	3.30 (+0.41)	0.81 (–0.22)	2.73 (+0.47)	1.47 (–0.07)	0.02 (–0.01)	0.03 (+0.01)	0.05 (+0.01)
Iran	5.38 (+1.78)	10.93 (+1.47)	2.81 (+0.27)	1.61 (+0.45)	2.42 (+0.38)	0.12 (+0.01)	2.53 (+0.49)	2.85 (+0.93)	0.06 (–0.04)	0.00 (+0.00)	0.06 (+0.03)
Saudi Arabia	3.97 (+0.83)	4.77 (+1.03)	7.38 (+0.92)	1.54 (+0.22)	0.88 (+0.07)	0.00 (+0.00)	2.00 (+0.33)	1.03 (+0.15)	0.21 (+0.04)	0.02 (+0.00)	0.57 (–0.06)
Egypt	15.22 (+2.80)	13.67 (+3.59)	0.05 (–0.03)	0.54 (+0.21)	4.65 (+0.47)	0.06 (–0.01)	0.82 (+0.50)	2.01 (+0.41)	0.40 (+0.07)	0.00 (+0.00)	0.01 (–0.01)
Nigeria	8.16 (+2.44)	0.44 (+0.34)	0.29 (+0.28)	5.22 (+3.05)	0.14 (+0.07)	0.00 (+0.00)	0.76 (+0.12)	1.91 (+0.69)	0.08 (+0.03)	0.01 (+0.01)	0.00 (+0.00)
Ethiopia	1.96 (+0.61)	0.00 (+0.00)	0.00 (+0.00)	1.22 (+0.64)	0.00 (+0.00)	0.00 (+0.00)	0.04 (+0.01)	0.83 (+0.31)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
China	7.92 (–0.68)	6.80 (–13.1)	19.06 (+2.86)	3.00 (+0.18)	112.1 (+15.8)	6.52 (+3.02)	6.75 (+1.91)	11.02 (–0.33)	3.28 (+0.64)	1.75 (–2.29)	0.80 (–0.48)
Vietnam	4.78 (+1.09)	16.85 (+5.35)	0.12 (+0.02)	1.63 (+0.58)	2.25 (+0.34)	0.17 (–0.01)	7.70 (+1.65)	1.39 (+0.23)	0.29 (–0.10)	0.03 (–0.15)	0.21 (–0.01)
India	0.01 (+0.00)	0.04 (–0.13)	0.09 (–0.03)	0.00 (+0.00)	0.05 (–0.31)	0.16 (+0.02)	1.20 (+0.74)	16.25 (+2.69)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Pakistan	2.30 (+0.44)	0.79 (+0.77)	0.24 (+0.11)	0.00 (+0.00)	3.17 (+0.71)	1.18 (+0.15)	1.28 (+0.87)	4.47 (+1.25)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Indonesia	12.52 (+1.93)	1.37 (+0.46)	0.08 (+0.00)	0.82 (+0.32)	3.11 (+0.49)	0.22 (–0.02)	6.22 (+0.76)	0.12 (–0.02)	0.52 (+0.12)	0.01 (+0.00)	0.00 (+0.00)
South Korea	4.65 (+0.74)	11.18 (–0.29)	0.11 (+0.00)	0.43 (+0.02)	1.29 (+0.02)	0.03 (+0.00)	3.66 (+0.22)	1.41 (+0.16)	0.61 (+0.04)	0.76 (+0.13)	0.23 (+0.03)
Other countries	142.6 (+21.7)	131.3 (+19.9)	16.75 (–0.27)	48.21 (+12.2)	45.44 (–0.14)	16.52 (+1.54)	65.85 (+2.39)	48.77 (+2.88)	8.70 (+0.91)	8.18 (+1.15)	14.15 (+2.75)
Whole world	**217.9 (+32.6)**	**200.8 (+19.5)**	**49.01 (+4.70)**	**64.48 (+17.9)**	**178.8 (+18.3)**	**25.80 (+4.47)**	**101.5 (+10.5)**	**93.54 (+9.26)**	**14.17 (+1.71)**	**10.79 (–1.15)**	**16.08 (+2.25)**
For reference: whole world (according to USDA estimates)	*231.3*	*252.4*	*38.8*	*56.7*	–	–	–	*93.5*	*13.2*	*14.1*	*15.8*

Sources: OECD-FAO, 2022; USDA, 2022.

↓ **Annex 22. Share of Countries of the Eurasian Region in Export of Agro-Industrial Products to Selected Countries, 2035, and Its Growth to the Average of 2019–2021 (in parentheses, in p.p.)**

Countries	Wheat	Corn	Other cereals	Rice	Soya beans	Other oilseeds	Protein feeds	Vege-table oils	Bovine meat	Swine meat	Poultry meat
Turkey	77.5% (+0.0)	57.9% (+23.9)	63.2% (+0.0)	17.8% (+0.0)	2.0% (+0.0)	29.4% (+0.0)	21.8% (+0.0)	49.4% (+4.5)	0.0% (+0.0)	0.0% (+0.0)	0.2% (+0.0)
Iran	38.7% (+35.4)	13.4% (+0.0)	53.8% (+15.2)	0.0% (+0.0)	0.3% (+0.0)	6.0% (+0.0)	0.2% (+0.0)	28.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)
Saudi Arabia	25.3% (+15.2)	0.0% (+0.0)	25.9% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	10.1% (+3.2)	5.1% (+4.4)	0.0% (+0.0)	10.0% (+6.9)
Egypt	59.3% (+5.4)	0.0% (+0.0)	1.0% (+0.0)	0.1% (+0.0)	0.0% (+0.0)	0.1% (+0.0)	3.6% (+0.0)	20.0% (+7.2)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)
Nigeria	16.9% (+0.0)	11.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	14.7% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)
Ethiopia	9.1% (+0.0)	0.0% (+0.0)	4.3% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)
China	20.4% (+19.7)	20.2% (+19.6)	22.5% (+21.9)	0.0% (+0.0)	1.9% (+1.1)	8.6% (+7.3)	0.3% (+0.0)	25.0% (+18.4)	10.2% (+9.8)	10.0% (+10.0)	20.0% (+11.5)
Vietnam	17.0% (+5.9)	3.3% (+1.6)	0.2% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.7% (+0.0)	13.2% (+8.8)	20.8% (+0.0)	20.4% (+13.4)
India	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.8% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	9.0% (+6.7)	25.1% (+0.0)	6.4% (+0.0)	0.3% (+0.0)
Pakistan	17.8% (+0.0)	0.0% (+0.0)	4.5% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.6% (+0.0)	48.5% (+0.0)	0.0% (+0.0)
Indonesia	10.9% (+7.7)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	6.0% (+0.0)	0.0% (+0.0)
South Korea	1.3% (+0.0)	2.7% (+0.0)	1.5% (+0.0)	0.0% (+0.0)	1.1% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.2% (+0.0)	0.0% (+0.0)	0.0% (+0.0)	0.0% (+0.0)
Other countries	29.9% (+10.2)	1.4% (+0.6)	25.2% (+10.6)	0.5% (+0.0)	0.6% (+0.1)	9.0% (+3.7)	7.6% (+3.2)	18.3% (+12.4)	6.5% (+3.7)	10.1% (+6.9)	11.8% (+9.0)
Whole world	**30.7% (+8.8)**	**3.6% (+1.6)**	**27.1% (+13.3)**	**0.5% (–0.1)**	**1.4% (+0.7)**	**8.8% (+3.5)**	**5.5% (+1.9)**	**16.1% (+9.9)**	**6.7% (+4.8)**	**9.3% (+7.1)**	**12.0% (+8.6)**

Source: EDB calculations based on data from OECD-FAO, COMTRADE, RF FCS.

↓ **Annex 23. Physical Volume of Exports of Agro-Industrial Products to Selected Countries from the Eurasian Region, 2035 (tonnes millions), and Their Growth against the Average of 2019–2021 (in parentheses, in p.p.)**

Countries	Wheat	Corn	Other cereals	Rice	Soya beans	Other oilseeds	Protein feeds	Vege-table oils	Bovine meat	Swine meat	Poultry meat
Turkey	6.39 (–0.83)	1.63 (+0.87)	1.55 (+0.74)	0.04 (–0.02)	0.07 (+0.01)	0.22 (–0.09)	0.67 (+0.18)	0.73 (+0.04)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Iran	2.28 (+2.19)	1.52 (+0.26)	1.51 (+0.58)	0.00 (+0.00)	0.01 (+0.00)	0.01 (+0.00)	0.01 (+0.00)	0.81 (+0.39)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Saudi Arabia	1.04 (+0.74)	0.00 (+0.00)	2.05 (+0.33)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.11 (+0.05)	0.01 (+0.01)	0.00 (+0.00)	0.05 (+0.03)
Egypt	9.60 (+2.92)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.04 (+0.03)	0.43 (+0.23)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Nigeria	1.52 (+0.56)	0.08 (+0.08)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Ethiopia	0.21 (+0.09)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
China	1.65 (+1.60)	1.52 (+1.40)	4.47 (+4.37)	0.00 (+0.00)	2.24 (+1.46)	0.65 (+0.61)	0.02 (+0.00)	2.65 (+1.89)	0.34 (+0.33)	0.14 (+0.14)	0.16 (+0.05)
Vietnam	0.86 (+0.47)	0.60 (+0.40)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.01 (+0.00)	0.04 (+0.03)	0.00 (–0.04)	0.05 (+0.03)
India	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	1.52 (+1.21)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Pakistan	0.44 (–0.08)	0.00 (+0.00)	0.01 (+0.01)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Indonesia	1.42 (+1.08)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
South Korea	0.06 (+0.01)	0.30 (–0.01)	0.00 (+0.00)	0.00 (+0.00)	0.01 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)	0.00 (+0.00)
Other countries	44.66 (+20.7)	1.98 (+1.11)	4.37 (+1.89)	0.28 (+0.09)	0.27 (+0.04)	1.47 (+0.68)	5.08 (+2.32)	9.07 (+6.34)	0.59 (+0.36)	0.87 (+0.64)	1.75 (+1.43)
Whole world	**70.14 (+29.5)**	**7.64 (+4.11)**	**13.96 (+7.92)**	**0.33 (+0.07)**	**2.60 (+1.51)**	**2.34 (+1.19)**	**5.81 (+2.53)**	**15.34 (+10.2)**	**0.98 (+0.73)**	**1.01 (+0.74)**	**2.01 (+1.55)**

Source: EDB calculations based on data from OECD-FAO, COMTRADE, RF FCS.

↓ **Annex 24. Specific and Absolute Macroeconomic Effects of Agricultural Output in Countries of the Eurasian Region, under the Inertial Scenario**

Indicator	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Production multipliers for the agriculture sector (USD per 1 USD of output in the sector)								
for gross output	1.77	2.44	1.95	2.49	2.62	2.49	1.95	
for agricultural output	1.10	1.60	1.13	1.88	1.26	1.88	1.13	
for GDP	1.18	0.94	1.20	1.00	1.30	1.00	1.20	
Normalised production multipliers for the agriculture sector (USD per 1 USD of output in the sector)								
for gross output	1.61	1.53	1.72	1.32	2.07	1.32	1.72	
for GDP	1.07	0.59	1.06	0.53	1.03	0.53	1.06	
Agricultural output (USD billions at 2020 prices)								
2021	1.66	8.98	14.97	2.99	88.85	3.58	25.65	**146.68**
2035	2.40	9.70	19.39	3.76	106.28	5.23	29.11	**175.86**
growth	0.74	0.71	4.42	0.77	17.43	1.65	3.46	**29.18**
growth, %	+45%	+8%	+29%	+26%	+20%	+46%	+13%	**+20%**
Effects of agricultural output on gross output (USD billions at 2020 prices)								
2021	2.67	13.71	25.76	3.94	184.27	4.73	44.12	**279.20**
2035	3.87	14.80	33.35	4.96	220.42	6.90	50.08	**334.38**
growth	1.19	1.09	7.60	1.02	36.14	2.18	5.96	**55.17**
growth, %	+45%	+8%	+29%	+26%	+20%	+46%	+13%	**+20%**
Effects of agricultural output on GDP (USD billions at 2020 prices)								
2021	1.78	5.27	15.91	1.59	91.69	1.91	27.25	**145.39**
2035	2.57	5.69	20.60	2.00	109.67	2.79	30.93	**174.24**
growth	0.79	0.42	4.69	0.41	17.98	0.88	3.68	**28.85**
growth, %	+45%	+8%	+29%	+26%	+20%	+46%	+13%	**+20%**

Source: EDB calculations based on data from national statistical offices, FAOSTAT, EEC, and Rosstat.

↓ **Annex 25. Specific and Absolute Macroeconomic Effects of Agricultural Output in Countries of the Eurasian Region, under the Targeted Scenario**

Indicator	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Production multipliers for the agriculture sector (USD per 1 USD of output in the sector)								
for gross output	1.77	2.44	1.95	2.49	2.62	2.49	1.95	
for agricultural output	1.10	1.60	1.13	1.88	1.26	1.88	1.13	
for GDP	1.18	0.94	1.20	1.00	1.30	1.00	1.20	
Normalised production multipliers for the agriculture sector (USD per 1 USD of output in the sector)								
for gross output	1.61	1.53	1.72	1.32	2.07	1.32	1.72	
for GDP	1.07	0.59	1.06	0.53	1.03	0.53	1.06	
Effects of agricultural output on gross output (USD billions at 2020 prices)								
2021	1.66	8.98	14.97	2.99	88.85	3.58	25.65	**146.68**
2035	3.34	11.25	22.60	4.66	124.48	6.70	32.78	**205.81**
growth	1.68	2.27	7.62	1.68	35.63	3.12	7.14	**59.14**
growth, %	+101%	+25%	+51%	+56%	+40%	+87%	+28%	**+40%**
Agricultural output (USD billions at 2020 prices)								
2021	2.67	13.71	25.76	3.94	184.27	4.73	44.12	**279.20**
2035	5.38	17.17	38.88	6.15	258.16	8.85	56.40	**391.00**
growth	2.71	3.46	13.12	2.21	73.89	4.12	12.28	**111.79**
growth, %	+101%	+25%	+51%	+56%	+40%	+87%	+28%	**+40%**
Effects of agricultural output on GDP (USD billions at 2020 prices)								
2021	1.78	5.27	15.91	1.59	91.69	1.91	27.25	**145.39**
2035	3.58	6.60	24.01	2.48	128.45	3.57	34.83	**203.53**
growth	1.80	1.33	8.10	0.89	36.76	1.66	7.58	**58.14**
growth, %	+101%	+25%	+51%	+56%	+40%	+87%	+28%	+40%

Source: EDB calculations based on data from national statistical offices, FAOSTAT, EEC, and Rosstat.

↓ **Annex 26. Specific and Absolute Macroeconomic Effects of Output of Agricultural Products Exported, Whether in Unprocessed or Processed Form, in Countries of the Eurasian Region, under the Inertial Scenario**

Indicator	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Production multipliers for the agriculture sector (USD per 1 USD of output in the sector)								
for gross output	1.77	2.44	1.95	2.49	2.62	2.49	1.95	
for GDP	1.18	0.94	1.20	1.00	1.30	1.00	1.20	
Output of agricultural products exported, whether in unprocessed or processed form (USD billions at 2020 prices)								
2021	0.11	3.07	2.14	0.22	15.68	0.04	1.78	23.04
2035	0.31	3.58	3.14	0.24	25.69	0.14	2.13	**35.23**
growth	0.20	0.51	1.00	0.02	10.01	0.10	0.35	**12.19**
growth, %	+188%	+17%	+46%	+9%	+64%	+256%	+19%	**+53%**
Effects of agricultural export-oriented production on gross output (USD billions at 2020 prices)								
2021	0.19	7.50	4.17	0.55	41.07	0.10	3.47	**57.05**
2035	0.55	8.74	6.11	0.59	67.30	0.36	4.14	**87.79**
growth	0.36	1.24	1.94	0.05	26.23	0.26	0.68	**30.75**
growth, %	+188%	+17%	+46%	+9%	+64%	+256%	+19%	**+53%**
Effects of agricultural export-oriented production on GDP (USD billions at 2020 prices)								
2021	0.13	2.88	2.58	0.22	20.44	0.04	2.14	**28.42**
2035	0.36	3.36	3.77	0.24	33.49	0.14	2.56	**43.93**
growth	0.24	0.48	1.20	0.02	13.05	0.10	0.42	**15.50**
growth, %	+188%	+17%	+46%	+9%	+64%	+256%	+19%	**+53%**

Note: The estimates of export-oriented agricultural production reflect the value of primary agricultural products exported, whether in unprocessed or processed form (obtained on the basis of average producer prices for the relevant types of products), and do not take into account either the additional volumes of output and added value that are created by export-oriented processing enterprises or the differences in the level of export and domestic prices for agri-food products (i.e. the estimates of export-oriented agricultural production are not identical to the value of exports of agro-industrial products).

Source: EDB calculations based on data from national statistical offices, FAOSTAT, EEC, and Rosstat.

↓ Annex 27. Specific and Absolute Macroeconomic Effects of Output of Agricultural Products Exported, Whether in Unprocessed or Processed Form, in Countries of the Eurasian Region, under the Targeted Scenario

Indicator	RA	RB	RK	KR	RF	RT	RUz	Eurasian region
Production multipliers for the agriculture sector (USD per 1 USD of output in the sector)								
for gross output	1.77	2.44	1.95	2.49	2.62	2.49	1.95	
for GDP	1.18	0.94	1.20	1.00	1.30	1.00	1.20	
Output of agricultural products exported, whether in unprocessed or processed form (USD billions at 2020 prices)								
2021	0.11	3.07	2.14	0.22	15.68	0.04	1.78	**23.04**
2035	0.31	4.13	4.46	0.26	33.09	0.22	2.17	**44.63**
growth	0.20	1.06	2.32	0.04	17.41	0.18	0.39	**21.59**
growth, %	+186%	+34%	+108%	+18%	+111%	+452%	+22%	**+96%**
Effects of agricultural export-oriented production on gross output (USD billions at 2020 prices)								
2021	0.19	7.50	4.17	0.55	41.07	0.10	3.47	**57.05**
2035	0.54	10.08	8.69	0.64	86.67	0.55	4.22	**111.39**
growth	0.35	2.58	4.51	0.10	45.60	0.45	0.76	**54.35**
growth, %	+186%	+34%	+108%	+18%	+111%	+452%	+22%	**+96%**
Effects of agricultural export-oriented production on GDP (USD billions at 2020 prices)								
2021	0.13	2.88	2.58	0.22	20.44	0.04	2.14	**28.42**
2035	0.36	3.87	5.36	0.26	43.12	0.22	2.61	**55.81**
growth	0.24	0.99	2.79	0.04	22.69	0.18	0.47	**27.39**
growth, %	+186%	+34%	+108%	+18%	+111%	+452%	+22%	**+96%**

Note: The estimates of export-oriented agricultural production reflect the value of primary agricultural products exported, whether in unprocessed or processed form, (obtained on the basis of average producer prices for the relevant types of products) and do not take into account either the additional volumes of output and added value that are created by export-oriented processing enterprises or the differences in the level of export and domestic prices for agri-food products (i.e. the estimates of export-oriented agricultural production are not identical to the value of exports of agro-industrial products).

Source: EDB calculations based on data from national statistical offices, FAOSTAT, EEC, and Rosstat.

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ABBREVIATIONS

CAREC — Central Asia Regional Economic Cooperation

CIS — Commonwealth of Independent States

CIS ICH — Interstate Council on Hydrometeorology of the Commonwealth of Independent States

COMTRADE — Commodity Trade Statistics Database

COVID-19 — Coronavirus Disease 2019

EAEU, the Union — Eurasian Economic Union

EDB, the Bank — Eurasian Development Bank

EEC — Eurasian Economic Commission

FAO — Food and Agriculture Organisation of the United Nations

FAOSTAT — Food and Agriculture Organisation Corporate Statistical Database website

FEACN — Foreign Economic Activity Commodity Nomenclature

GDP — gross domestic product

GFSI — Global Food Security Index

ha — hectare

HLPE — High Level Panel of Experts

hwt/ha — hundredweight per hectare

IEF RAS — Institute of Economic Forecasting of the Russian Academy of Sciences

IPCC — Intergovernmental Panel on Climate Change

ITC — International Trade Centre

ITC — international transport corridor

kcal — kilocalorie

kg — kilogram

km — kilometre

KR — Kyrgyz Republic

LPI — Logistics Performance Index

MAPE — mean absolute percentage error

nes — not elsewhere specified

NSR — Northern Sea Route

NTB — non-tariff barrier

OECD — Organisation for Economic Cooperation and Development

p.p. — percentage point

RA — Republic of Armenia

RB — Republic of Belarus

RF — Russian Federation

RF FCS — Federal Customs Service of the Russian Federation

RK — Republic of Kazakhstan

Roshydromet — Russian Federal Service for Hydrometeorology and Environmental Monitoring

Rosstat — Federal State Statistics Service of the Russian Federation

RT — Republic of Tajikistan

RUz — Republic of Uzbekistan

SDG — Sustainable Development Goal

TAR — Trans-Asian Railway

TEU — twenty-foot equivalent unit

TITR — Trans-Caspian International Transport Route

TRACECA — Transport Corridor Europe-Caucasus-Asia

UN — United Nations Organisation

USA — United States of America

USD — United States dollar

USDA — United States Department of Agriculture

USSR — Union of Soviet Socialist Republics

WB — World Bank

WFP — World Food Programme

% — per cent

Macroeconomic Review
(RU)

A regular EDB publication, which provides an overview of the current macroeconomic conditions in the EDB member states and estimates their development in the short-term perspective.

Macroeconomic Outlook
(RU/EN)

EDB Macroeconomic Outlook 2023

The analysis summarises economic developments in the Bank's member states in 2022 and provides key macroeconomic projections for the region's countries for 2023 and 2024.

Report 21/1
(RU)

Promoting the Role of the EAEU Currencies in Global Transactions

EAEU currencies service around 2% of global trade. As for the EAEU countries, payments in their currencies have notably increased over the past seven years — their share in trade flows jumped from 63% in 2013 to 74% in 2019.

Report 21/2
(RU/EN)

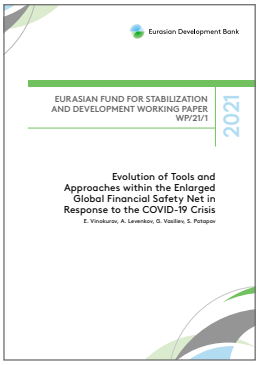
Uzbekistan and the EAEU: Prospects and Potential Impact of Economic Integration

The report estimates the potential effects of Uzbekistan's integration with the EAEU and outlines promising areas for cooperation between the current Union member states and Uzbekistan.

Report 21/3
(RU/EN)

Investment in the Water and Energy Complex of Central Asia

The report analyses Central Asia's water and energy complex after 30 years of independence of the five Central Asian countries (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) and assesses their cooperation in the water and energy complex.



Working Paper WP/21/1
(RU/EN)

Evolution of Tools and Approaches within the Enlarged Global Financial Safety Net in Response to the COVID-19 Crisis

This working paper provides the analysis how the GFSN responded to pandemic on global level and on regional level (in the EFSD countries).

Working Paper WP/21/2
(RU/EN)

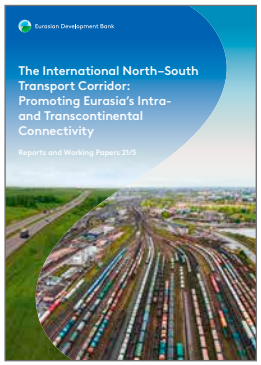
Total Debt is So Much More Than Just Sovereign Debt. Contingent Liabilities in Armenia, Belarus, Kyrgyz Republic, and Tajikistan

This study aims to contribute to understanding the potential risks and impacts of both explicit and implicit contingent liability shocks on government fiscal and debt positions in the EFSD recipient countries.

Report 21/4
(RU/EN)

EDB Monitoring of Mutual Investments

Mutual investments in Eurasia, calculated using a new methodology, reach US $46 billion. FDI has been growing steadily since 2016.



Report 21/5
(RU/EN)

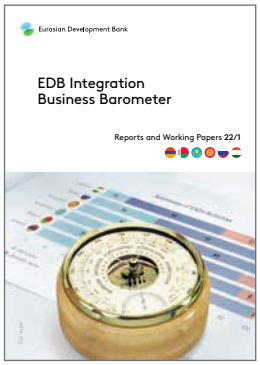
The International North–South Transport Corridor: Promoting Eurasia's Intra- and Transcontinental Connectivity

Linking up the INSTC with Eurasian latitudinal corridors could ensure around 40% of container traffic.

Joint report by the Eurasian Development Bank and the Global Energy Association
(RU/EN)

Green Technologies for Eurasia's Sustainable Future

The report is prepared by the key international industry experts and young scholars. It contains the results of technical research aimed at solving today's energy challenges and helping to reduce the carbon footprint in Eurasia.



Report 22/1
(RU/EN)

EDB Integration Business Barometer

About 73% of companies feel positive about the EAEU and say it makes doing business easier.

Report 22/2
(RU/EN)

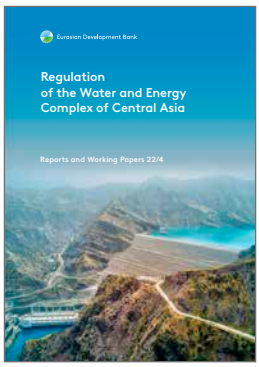
International North–South Transport Corridor: Investments and Soft Infrastructure

The study assesses the investment potential of the INSTC, identifies barriers to its development and provides recommendations on how to eliminate them.

Report 22/3
(RU/EN)

The Economy of Central Asia: A Fresh Perspective

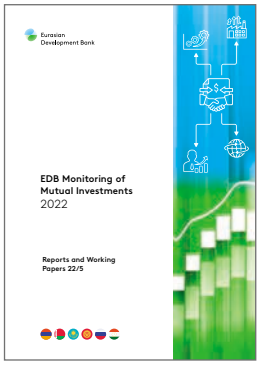
The report provides a renewed perspective on Central Asia as a large, dynamic and promising economic region and analyses its current structural changes and major growth areas.



Report 22/4
(RU/EN)

Regulation of the Water and Energy Complex of Central Asia

The report scrutinises historical data and international experience to suggest five institutional solutions for effective regulation and development of Central Asia's water and energy complex that would benefit all countries of the region.



Report 22/5
(RU/EN)

EDB Monitoring of Mutual Investments — 2022

This report continues the series of publications detailing the findings of a long-standing research project monitoring mutual direct investments of the CIS countries and Georgia.

Eurasian Development Bank

RESEARCH DEPARTMENT
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