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Food security in Kazakhstan within the integration into the Eurasian Economic Union: Ratings and ways to reduce threats

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On May 29, 2014 Belarus, Kazakhstan and Russia signed an agreement on the integration to the Eurasian Economic Union (EaEU) which formally goes into effect on January 1, 2015. A new common market of goods and factors of production will appear on the map of the planet. There are 170.3 million people living here (or 4.4% of the world population), 5.6% of which are citizens of Belarus and 10% are from Kazakhstan and 84.4% are Russians. The market territory occupies 16,4% of the terrestrial land where 25% of basic types of minerals reconnoitered in the world are concentrated and its cost is estimated in the range from 30 to 40 trillion United States dollars (USD). The share of the EaEU accounts for about 40% of the world supplies of natural gas, 25% coal, 20% oil, 25% forest, 13% of arable land and 11% of fresh water. The unique transcontinental geographical position allows to accumulate scale trade streams between Europe and Asia and thereby to increase world competitiveness of the region and the EaEU.

The entry of Kazakhstan into the new integration alliance is connected to marginal advantages as well as particular threats. Therefore, the main problem is searching an optimum way of using the advantages of integration at simultaneous softening of its risks.

The main advantages can be summarized as follows. Firstly, Kazakhstan has an opportunity to expand its trade through Russian access to three world oceans. Trade growth will also take place through creating a large domestic market within indivisible customs territory of the EaEU. Secondly, the membership in the EaEU will attract additional investments from Russia and Belarus to Kazakhstan. Additional inflow of funds will result in the creation of additional jobs, increase tax revenues and access to modern technology. Thirdly, as a consequence of competitiveness, the choice for goods and services will expand, there will be price falls and quality increase. Consumer benefits will rise owing to reduced cost and high standard of living.

Kazakhstan is taking significant steps to improve the level of investment in the country. The government is now on the initiative of President Nursultan Nazarbayev releases a new bill, which is aimed at improving the investment climate and provided conditions for attracting foreign and domestic investment to the economy of the country. For this purpose, firstly, it is supposed to exempt investors from payment of corporate income tax for ten years, a land tax - for ten years, the property tax - for eight years. Secondly, there is considered compensation to 30% of investment cost of the investor from the state after input of object into operation (an investment subsidy).Thirdly, there is considered an introduction of tax stability rates (except for VAT and excises), ecological collecting and payments for a period of ten years from contract conclusion with investors. Fourthly, by the bill within the signed contracts the investors are granted the right to attract foreign labor for the entire period of construction of the investment project and one year after input of object in operation, out of quota and without permissions. These bill standards will be provided for new investment projects worth not less than 20 million USD in priority branches of economy according to a state program of industrialization [1].

On the other hand, the membership in the EaEU is connected to the risk of decrease in food and economic security for Kazakhstan as high import reliance on Russia and Belarus on many strategically important types of agricultural production and foods. Thus, the import of sausages makes 99% of the total amount of import deliveries of the countries of the EaEU, canned meat – 88%, condensed milk and cream – 62%, vegetable oil – 56%, butter – 40% [2].

The main way to decrease threats to food security can be defined on the basis of the comparative analysis of positions of the countries of the EaEU in the international ratings and detection of weaknesses of Kazakhstan for the purpose of strengthening the measures of their state support. Let us stop in more detail on indices of human development and food security (table 1).

Table 1 – Ratings of Belarus, Kazakhstan and Russia [3]

Index	Country rating according to index			Data sources
	Belarus	Kazakhstan	Russia	
Human Development Index 2013 (186 countries)	50	69	55	United Nations Development Program
The Global Food Security Index 2014 (109 countries)	47	58	40	The Economist Intelligence Unit of British journal Economist

The Human Development Index (HDI) is a summary measure of human development and characterizes the average level of achievements of the country on three basic dimensions, such as a long and healthy life, access to knowledge and a decent standard of living. Since 1990 the index has annually been worked out by the experts of United Nations Development Program (UNDP) along with the group of independent international experts using in the work along with analytical development, the statistical data of national institutions and international organizations.

The HDI is paid off in two stages [4]. At the first stage there is carried out the procedure of indicators rationing which consists in their reduction to the uniform scales accepting values from 0 to 1. For this operation the following formula is used:

$$\frac{x_i - x_{min}}{x_{max} - x_{min}}, \quad (1)$$

where x_i is an indicator meaning to i-country;
x_{min} , x_{max} are respectively minimum and maximum values of an indicator, recorded according to all list of the countries for the particular period.

Thus, the maximum values are determined by actually observed values on time series, starting from 1980 and finishing with the year of measurement. For example, the last research covers the period of 1980-2012. The maximum value of life expectancy index was observed in Japan and 83,6 years in 2012 equaled. The minimum values, as a rule, are set as minimum admissible for a particular index. For example, at least for life expectancy at birth in the report of 2013 was established at the level of 20 years. The maximum and minimum values are discussed in reports for the corresponding year in advance (table 2).

At the second stage there is carried out the procedure of aggregation of the normalized indices in the HDI. Mathematically the HDI represents geometric average from the three subindices corresponding to the three dimensions of human development:

$$HDI = (I_{Life}^{1/3} \cdot I_{Education}^{1/3} \cdot I_{Income}^{1/3}), \quad (2)$$

where I_{Life} is life expectancy index;
$I_{Education}$ is education index;
I_{Income} is index of Gross National Income (GNI).

Table 2 – Goalposts for the HDI 2013 [3]

Indicator	Index	Observed maximum value of indicator during 1980-2012	Minimum value of indicator
Life expectancy at birth (years)	Life expectancy index, (I_{Life})	83,6 (Japan, 2012)	20,0
Average mean years of schooling (years)	Mean years of schooling index ($I_{Mean\ years}$)	13,3 (USA, 2010)	0
Average expected years of schooling (years)	Expected years of schooling index ($I_{Expected\ years}$)	18,0 (maximum value	0
	Combined education index ($I_{Education}$)	0,971 (New Zealand, 2010)	0
The Gross National Income per capita (in USD in purchasing power parity (PPP)	Income index (I_{Income})	87478 (Catar, 2012)	100

Education index aggregates two normalized indicators characterizing schooling duration. In the report of 2013 it is worked out according to formula:

$$I_{Education} = \frac{\sqrt{I_{Mean\ years} \cdot I_{Expected\ years}} - 0}{0{,}971 - 0} \quad (3)$$

On the basis of the HDI of the country they are ranged in decreasing order of its value.

The report of UNDP in 2013 presented the data on the index, calculated on the basis of 2012. In 2013, the rating of the HDI occupied 186 countries and territories. Below there are represented the rankings of the participating countries of the EaEU, published by UNDP in 2013 (table 3).

Table 3 - Ratings of the countries of the EaEU on the HDI 2013 [5]

Country	HDI ratings	HDI	Life expectancy at birth	Average duration of schooling	Expected duration of schooling	GNI per capita
		(value)	(years)	(years)	(years)	(USD for 2005 in PPP)
	2013	2012	2012	2010	2011	2012
Belarus	50	0,793	70,6	11,5	14,7	13 385
Russia	55	0,788	69,1	11,7	14,3	14 461
Kazakhstan	69	0,754	67,4	10,4	15,3	10 451

The HDI 2013 for Kazakhstan made 0,754 points, which allowed the country to take the 69th place among 186 countries. In terms of food security, there is a serious threat to low values of life expectancy and Gross National Income (GNI) per capita in Kazakhstan compared with Belarus and Russia because 45% of the population of Kazakhstan lives in rural areas.

Among the countries of the EaEU Kazakhstan has the inferior indicators on financing of healthcare and education (respectively 2,5 and 3,1% of Gross Domestic Product (GDP)).

Therefore the special attention needs to be paid to the optimization of resource providing of healthcare and employment of rural residents (table 4).

Table 4 - Control over resources in the countries of the EaEU on the HDI 2013 [5]

	Economy					Public expenditure	
	GDP	GDP per capita	Fixed capital investment	Consumer Price Index	Total expenditure of the central government on final consumption	Healthcare	Education
	billion. USD	USD for 2005	% GDP	2005 =100	% GDP	% GDP	% GDP
	2010	2010	2010	2010	2010	2009	2005-2010
Belarus	125,0	13191	37,6	162	13,5	4,4	4,5
Kazakhstan	191,5	11568	23,1	163	16,9	2,5	3,1
Russia	2101,8	14808	23,9	162	9,8	3,2	4,1

Accordingly, Kazakhstan takes considerably lower place than Belarus and Russia according to World Bank ratings (table 5).

Table 5 - Ratings of Belarus, Kazakhstan and Russia in terms of spending on healthcare and education [3]

Indicator	Rating of the country according to the indicator			Data source
	Belarus	Kazakhstan	Russia	
Gross Domestic Product 2012, million USD (190 countries)	68	49	8	World Bank
Expenditure on Health 2012, % GDP (187 countries)	69	136	106	World Bank
Level of national expenditure on education 2012, % GDP (153 countries)	83	125	98	World Bank

The Global Food Security Index (GFSI) has been issued by analytical division of the Economist Intelligence Unit (EUI) of British journal Economist and sponsored by the American multinational company DuPont since 2012.

The food security is defined on the basis of analysis and assessment of three basic groups of the indices characterizing three criteria of food security of the country:

- level of affordability and food consumption (Affordability) (x_1);
- availability and sufficiency of food (Availability) (x_2);
- level of quality and food safety (Quality & safety) (x_3).

In 2014 the index was paid off on the basis of 28 indicators aggregated in the three specified categories across 109 countries. The countries are ranged in decreasing order of the GFSI. The high position of the country in a rating means that its food security is at a high level.

Mathematically the food security index is weighed with average arithmetic size of three aggregated normalized indices on formula:

$$\text{The Global Food Security Index} = (w_1 \cdot x_1 + w_2 \cdot x_2 + w_3 \cdot x_3)/(w_1 + w_2 + w_3), \quad (4)$$

where w_1, w_2, w_3 are respectively the weight of each aggregated indicator, thus $(w_1 + w_2 + w_3) = 1$.

At calculation of the Index 2013 the weight was distributed as follows:

$$\text{The Global Food Security Index 2013} = 0{,}40\ x_1 + 0{,}44x_2 + 0{,}16x_3 \quad (5)$$

Six of 28 indicators are aggregated in x_1, eleven in x_2 and eleven in x_3. Each index will be transformed to an index and further participated in calculation of one of the three aggregated indicators with the corresponding in advance established weights.

At calculation of the GFSI there are used such quantitative indices as the percentage of households' expenses on consumption and food losses (FAO); the percentage of the population living under two USD/day in PPP (World Bank), agricultural import tariffs (WTO) and other indicators of the international organizations reflecting various aspects of food security in the country. Eleven indicators out of 28 are qualitative and defined on the basis of the expert estimates which are carried out by EUI. They are a level of access to financing for farmers, corruption level, political instability, existence of agricultural infrastructure, monitoring and control of a delivery, etc. Quality indicators are estimated in the range of 0-1 or 0-4.

Table 6 - Rating of the EaEU countries according to the Global Food Security Index in 2014 [6]

	Belarus		Kazakhstan		Russia	
	Value /100	Rating /109	Value /100	Rating /109	Value /100	Rating /109
Level of food availability and consumption	61,1	45	58,2	51	70,7	33
Food availability and sufficiency	58,1	45	42,7	87	51,2	62
Food quality and safety level	67,4	39	70,3	36	74,3	30
Global Food Security Index	60,8	47	53,3	57	62,7	40

The GFSI 2014 in Kazakhstan has made 53,3 points while this index for Belarus and Russia is higher than 60 (table 6). As it is known, the basis of safety is made by the level of agricultural development. Therefore, among 28 indicators special attention is paid to those, which characterize agricultural resource management. A serious threat to food security is posed by low values of two main indicators. The first indicator is the level of public expenditure on agricultural research and development (R&D), which is measured on a 9-point scale by EIU experts and makes one point for Kazakhstan (table 7). Hence, another way of reducing threats to food security is increasing the expenditure on agricultural R&D funding which is the part of 'green box' according to WTO.

Table 7 - Ratings of Belarus, Kazakhstan and Russia on R&D expenditure [3]

Indicator	Rating of the country according to the indicator			Data source
	Belarus	Kazakhstan	Russia	
Level of R&D Expenditure 2012, % GDP (91 countries)	43	69	32	UN Educational, Scientific, and Cultural Organization (UNESCO)

In Kazakhstan more than 80% of agricultural GDP is made by farmers and households. So the second important indicator is the level of access to financing for farmers which is measured by EIU experts in a 4-point scale and equaled to two points for Kazakhstan. Considerably low level of financing for farmers is one of threats to food security for the republic. The state needs to increase the expenses to support farmers allowed by rules of WTO. First of all, they include government service programmes on general services, such as training services, extension and advisory services, marketing and promotion services. The other way to increase the access of small-scale producers to financing there could be a legislative strengthening of the legal status of households as full-fledged participants of the financial services market. Here it is necessary to strengthen the measures of the state support directed on maintaining of agricultural infrastructure and cooperation.

Thus, the Eurasian Economic Union as the new market assumes the opening of borders for free movement of goods, services and capital that creates additional threats to food security of the country. Agriculture of Kazakhstan as a basis for food security is a small-scale farming. The analysis of the international ratings confirms, that decrease in threats of food security dictates the need for strengthening of measures of the state support of rural areas. In our opinion, such measures are, first of all, the strengthening of healthcare resource providing, increasing in expenses on agricultural research and development and increasing of financing level for farmers and households.

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