FOOD SUPPLY SECURITY: THE CASE OF EAEU MEMBER-STATES

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ABSTRACT

In this respect one should develop alternative sources of food supply to provide food security in major disasters. This study provides the analysis of the current situation and trends in promoting food security at the global level, more precisely, in the member states of the Eurasian Economic Union. We have examined the world experience in food security provision. In this respect, the leading role is currently played by the UN, European Union and by the World Health Organization. These institutions have developed practical recommendations to improve food security. The conditions of food security in the member states of the Eurasian Economic Union are determined by the authors. We also have substantiated the expediency of the proposed cluster approach to food industry development, as well as related industries. It affects productivity improvement, creates opportunities for innovation and fosters new business. Enterprises of all forms of ownership can be easily integrated in a cluster. In this case, agricultural activities are of particular interest not only as a source of food for the population, but also as a source of fodder that is critical for animal husbandry, providing meat and dairy products.

Keywords: Food Supply Security, Agrarian-Industrial Economies, Consumption Standards, Cluster, Eurasian Economic Union (EAEU).

INTRODUCTION

Food supply security is regarded as one of major problems of the modern world (Kang, 2015; Lazarevna et al., 2017). International organizations and national governments are working actively on strengthening food supply security. They diversify food supplies in specific countries, work on forecasting climate changes, restore soil, manage irrigation work, accumulate reserves and make agreements on mutual assistance. Food supply security presents a multilevel process (Tendall et al., 2015). The problem of food supply security is being solved at the global level, at the level of inter-state alliances and agreements, at the regional level and at the level of individual countries.

However, even today food supply security is sufficient in the Eurasian Economic Union (EAEU). For example, Kazakhstan imports food products, which value exceeds the value of exported food by 1.5–2 times. At that, Kazakhstan is the world's largest grain exporter. In order to provide viability of their countries, governments of the EAEU states need science-based food supply security programs and action plans in case of destabilization. This predetermined relevant purpose and tasks of this research. It provides systematized information regarding food security

in the world and in EAEU states as well as ways used to improve it. Practical recommendations can be used in the elaboration of governmental programs and plans of EAEU states and other countries with similar direction of economic development, which will promote food security.

The most substantial problems in terms of providing global food supply security include the following (Elemesov and Ondash, 2015; Protracted conflicts causing alarming spikes in severe hunger, 2016; Bachev, 2016):

1. Population growth and its uneven distribution.
2. Decrease in soil fertility.
3. Lack of fresh water.
4. Lack of a significant increase of plowed fields.
5. Climate change.
6. Conflicts (both economic and military ones).

It is pertinent to point out that European countries make serious efforts in order to plan agricultural activities; subsidies and protectionism are widely used to support European farmers. But in general, European countries are holding back food production in order to provide high prices. Potentially, they could significantly increase the volume of food production (Kareem et al., 2015). In addition to food wastes, resources spent on their production and their negative impact on the environment are of great importance (e.g., the use of chemicals in the cultivation process) (Porter et al., 2016).

Taking into account the above-mentioned factors, in the EU countries the emphasis of public support shifts from government programs on compensation of damages caused by natural disasters to insurance based on public-private partnership in the context of the implemented Common Agricultural Policy (CAP) (Bojnec and Fertő, 2015).

The US government expressed deep concern regarding the country's food supply security in late 2010s. One should note that the US food safety legislation hasn't been changed for about 70 years. American senators passed a few bills, such as: HR 2749 (Food Safety Enhancement Act, 2009) and S-510 (Food Safety Modernization Act, 2011). However, these bills are not aimed at increasing food production. They address issues related to production control and import of food products.

The international processes of globalization and integration influence the development of food supply security mechanisms in developing countries and the formation of state policy in this sphere. One should note that all EAEU member-states are members of the United Nations and participate in global processes in order to improve food supply security. Some of them are also parties to a number of international agreements, such as Free Trade Area, the Customs Union, Eurasian Economic Space, and the World Trade Organization. Within the terms of international agreements, parties enhance their food supply security, which is achieved by promoting the movement of goods. These countries also contribute to the improvement of food supply security in the region. In addition, each of them is interested in enhancing food supply security at the country level (Mujahid and Kalkuhl, 2015). Certainly, the following tendencies are traced in the majority of developing agrarian-industrial countries (such as Brazil, Argentina, Mexico, India and actually EAEU Member-States).

Poultry industry in Kazakhstan can serve as an example. Due to the emergence of new technologies, poultry has become one of the most affordable and accessible products of animal origin. According to data provided by the Union of Poultry Keepers of Kazakhstan, domestic

consumption of poultry meat in Kazakhstan amounts to no less than 300 thousand tons. In 2010, Kazakhstan produced 80-156 tons of poultry meat. By 2014, annual production volume has increased to 138-140 tons; import of poultry meat in 2015 amounted to 154 000 tons (Brief review of the poultry industry of Kazakhstan, 2010-2015). It is obvious that Kazakhstan could not keep up with changes in food technologies and took an opportunity to provide public demand for poultry meat. The absence of qualitative statistical information led to difficulties in managing food production and food supply security in general. Major changes in the national economy, primarily in the agrarian policy, are required in order to improve the situation and to reduce dependence on imported food.

There are two global factors that predetermine dramatic worsening of food supply security in all post-Soviet countries. First, economies of individual republics had never been built as independent and self-sufficient. They were parts of the Soviet economic complex (Zoidov and Medkov, 2015). No problems occurred within each republic. For example, consider the fact that Uzbekistan imported cereals and their products, and exported cotton. The nationwide food supply security remained balanced. Secondly, after gaining independence, almost all republics of the former Soviet Union disbanded collective farms, which served as major agricultural organizations and the major (if not the only ones) food suppliers. Instead, small farms and cooperatives appeared. Farmers could not afford mechanization in order to ensure the entire work cycle, they were not able to conduct irrigation and their literacy was often very poor (Teslenok, 2015). Besides, other reasons included decrease in areas of plowed fields, uncontrolled flow of imported products on domestic markets, soaring inflation, and lack of the rule of law.

In the early 2000s, the situation stabilized (mainly due to food import). Post-Soviet states were able to provide the balance between available food and consumption. To that end, states worked out various strategies. Thus, Kazakhstan strengthened its food supply security by increasing grain yields and its exports. Uzbekistan got rid of cotton monopoly, increased grain production from 1 up to 8 million tons per year, developed gardening, floriculture, winegrowing (the volume of agricultural production doubled since Uzbekistan gained its independence) (Davletov and Egamberganova, 2015). Turkmenistan was forced to limit its consumption of goods. Distribution system, price controls, cards, and other mechanisms were involved (Dankov, 2013). Kyrgyzstan ramped up the production of animal products due to good grazing. However, it is not able to provide its population with domestic food products to the full extent. In Tajikistan, food production and consumption reduced as a result of market reforms. In order to improve the situation and to reduce dependence on food imports, measures on improving the yield of vegetable crops were taken, rainfed winegrowing and horticulture were developed.

The international community has already taken various measures to solve these problems. The emphasis is laid not only on quantitative parameters, but also on quality. The World Health Organization set a number of requirements related to the food chain, namely: relevance of produced and promoted food products in terms of a healthy diet; the use of appropriate labelling; control of goods at all service stages and at the level of various organizations. The European Union also acts as a control policy generator, an investor and a global actor. Research and innovation studies in the field of food and nutrition are among the main priorities of the European Union (Gormley, 2016).

Food and Agriculture Organization of the United Nations set a number of requirements related to food supplies:

1. Sufficient amount of food products having appropriate quality supplied through domestic production or imports.
2. Access of persons to appropriate resources (entitlements) aimed at acquiring appropriate foods for a balanced diet.
3. Use of pure water in the preparation of food under relevant sanitation.
4. Stability, access to adequate food at all times. In 2009, Food and Agriculture Organization of the United Nations presented its report *"How to Feed the World in 2050"*.

According to this report, nearly all of the expected population increase will occur in developing countries. Food security, according to forecasts, will require increase in food production (net of food used for biofuels) by 70 percent. The required increase in food production is hindered by urbanization, which will continue at an accelerated pace along with production of biofuels and climate change, which limit the availability of land, water resources, biodiversity and agricultural development (Kagan, 2016).

FAO also stressed the need to double food production by 2050 and to develop food crops. Today, three major crops are primarily grown all over the world (corn, wheat and rice) along with several other crops. As a result, uniform crops are grown on large areas, making agriculture more vulnerable to major risks (pests, diseases, climate change) (Massawe et al., 2016). Researchers also emphasize the lack of crop variety combined with a gradual change in their diversity. For example, in the United States many fruits and vegetables have disappeared from the diet throughout the last 40 years, and this trend continues throughout the world. Subsequently, more and more people will be fed by less crops (Khoury et al., 2014).

Basic aspects of this problem have already been set out in a number of international instruments. For example, Resolution adopted by the UN General Assembly on 25 September 2015 *"Transforming our world: the 2030 Agenda for Sustainable Development"* puts an obligation to eradicate poverty in all its forms and dimensions, including extreme poverty by 2030, to end poverty and hunger, in all their forms and dimensions by achieving relevant food security. To this end, the UN declared the need to 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 inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment, the need to 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. Governments, international institutions, entrepreneurs as well as other non-state actors and individuals should enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology. Socio-economic development depends on rational use of nature resources including the need to sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans, by conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands; to conserve and sustainably use biodiversity and ecosystems; to protect species of flora and fauna (Kardooni et al., 2016; Reese, 2017).

Food Aid Convention is aimed at contributing to world food security and at improving the ability of the international community to respond to emergency food situations and other food needs of developing countries by:

1. Making appropriate levels of food aid available on a predictable basis, as determined by the provisions of this Convention.
2. Encouraging members to ensure that the food aid provided is aimed particularly at the alleviation of poverty and hunger of the most vulnerable groups, and is consistent with agricultural development in those countries.
3. Including principles for maximising the impact, the effectiveness and quality of the food aid provided as a tool in support of food security.
4. Providing a framework for co-operation, co-ordination and information-sharing among members on food aid related matters to achieve greater efficiency in all aspects of food aid operations and better coherence between food aid and other policy instruments (Food Aid Convention, 1999).

Modern food supplies policies face a number of challenges. One can witness negative changes in ecosystems, depletion of natural resources (including carbon based energy, phosphorous soils, fresh water groundwater aquifers and fisheries), social pressure (urbanization, population growth and food-related diseases) (Barling and Duncan, 2015). In addition to destruction of ecosystems, one can also witness abuses on the part of the population. Thus, people with high income consume large amounts of food and require their diversity. At the same time they emit large amounts of unused product (Kagan, 2016). Supply of food products involves not only food safety, but also trade and environmental regimes. Population should use not just any products that stave off hunger, these products should provide an optimal level of public health and its improvement. The Committee on World Food Security is a legitimate political body, able to manage the development of sustainable food security policies. This body developed a number of instruments, such as the Voluntary Guidelines for the Responsible Tenure of Land, Fisheries and Forests in the Context of National Food Security (2012), the Global Strategic Framework (2012), and the Principles for Responsible Investment in Agriculture and Food Systems (2014). However, these efforts are insufficient (Barling and Duncan, 2015).

This problem becomes very relevant due to climate change (Porter et al., 2014). This is particularly evident in areas where food security is absent or weakly expressed. This leads to malnutrition and hunger. Besides its direct impact on farming and food production, climate change can have indirect effect through its impact on water resources. One should take measures to counter climate change and its negative effects and to adapt farms and food security to the existing changes.

The Fifth Assessment Report of the United Nations Intergovernmental Panel on Climate Change highlighted the effects of water scarcity and higher temperatures on crop yields and the higher food prices and diminished food security that may result (Gustafson et al., 2016).

In addition, one should also take measures to improve the efficiency of land use in animal husbandry. It is advisable to periodically assess the state of lands used for the cultivation of food crops in order to get a clear picture regarding their condition, suitability and effectiveness. Besides, one should investigate crops and their effectiveness in animal nutrition, particularly if these crops are generally used for human nutrition. Increase in crop productivity is an important factor in terms of growing crops used both for human and animal nutrition. In order to improve the efficiency of land use, one could use local redistribution of lands used for growing crops and grazing with regard to their features. One should choose the best animal species for breeding

with due regard to relevant fodder in regions where food supply is problematic. Not all types of fodder are grown in sufficient quantity (van Zanten et al., 2016).

Currently the considerable attention is given to the need to develop alternative food (fungi, food-related bacteria) for use during global disasters (Baum et al., 2016). The analysis of future food security, as a rule, focuses on managing gradual trends (population growth, depletion of natural resources and environmental degradation). However, there are risks that may cause significant and sharp decline in food security. For example, a nuclear war, volcanic eruptions, asteroid impacts, which can isolate the Earth from sunlight, causes dramatic global climatic cooling (Baum et al., 2016). Countries that depend on imports should implement measures aimed at preventing acute food shortages in the event of an insufficient number of imported goods (e.g., crop failure); they should also develop alternative food security strategies. For example, expansion of arable lands is possible not only in the regions with active crop farming, but also in India and China, which only import food. However, sustainable development of agriculture requires preservation of biodiversity and ecosystem services (Delzeit et al., 2016).

Scientists also point out the need for urban farming. Urban gardens, agriculture, and water management are essential elements of urban food supply (Barthel and Isendahl, 2013). This is particularly important for countries characterized by growing urbanization and industrialization. Furthermore, urban farming is considered as significant contribution of fisheries and aquaculture to poverty alleviation, economic growth, food security provision public health care in the developing economies (Béné et al., 2016). However, the development of water and food supply should comply with public and environmental protection requirements. This requires safe supplies with due regard to the biological, chemical and radiological threats, social, economic and environmental sustainability of production systems and supply chains, sustainability to social, economic and ecological repercussions, safety of fish, human beings and the environment; aqueous food authenticity.

Among fast-growing economies there is a particular emphasis on sustainable intensification strategies that can interact with other food-related areas, such as land use, biodiversity, animal safety and human nutrition. Effective ecological intensification requires understanding of land use specifics on a different scale, life support of terrestrial and underwater organisms, determining ecosystem management costs, sustainable use of water and fertilizers (Grafton et al., 2015).

It should be borne in mind that efficient agriculture does not necessarily imply active state agrarian policy. For example, Australia has a food security program. However, this country exports more than 70% of agricultural production. Agriculture operates within a competitive production system. Farmers use state-of-the-art technology and management systems to improve efficiency and performance (Lawrence et al., 2013).

Thus, the United Nations and the European Union have different food security strategies both for the developed countries and for the emerging economies (Brown et al., 2015; Tai et al., 2014). States and their respective researchers should be engaged in closer cooperation with a view to develop new, more efficient food security programs. Specific attention should be paid to the developing economies, where the population is suffering from hunger and malnutrition.

We have used the foresight studies. In particular, analysis of food supply security in the EAEU member-states (in comparison with each other) and the world's situation in this field was carried out by involving all interested parties in relevant investigation and discussion.

Analysis and synthesis were used to determine the adequate consumption level and the list of goods required for a varied diet, to analyze international practices in order to ensure food supply security. In particular, data from different sources were collected, grouped and analyzed.

The level of regional self-sufficiency in terms of food served as a reference indicator. Based on this indicator, classification of regions into three groups was carried out: producing (exporting) regions, self-sustaining regions and consuming (importing) regions.

RESULTS

Naturally, nutrition should be varied. People should have access to products of vegetable and animal origin. The list of main animal products includes cattle meat, pork, poultry meat, butter, cheese, cottage cheese and sausages. The list of main plant products includes potatoes, vegetables, grapes, melons, watermelons, apples, pears, vegetable oil and sugar. We have calculated a difference to determine the condition of self-sufficiency of countries in terms of food for the population. Calculations are based on production and consumption data of main agricultural products and food supplies in the EAEU member states in 2016, provided by the Eurasian Economic Commission that was monitoring food security in the EAEU. The data are presented in Table 1.

Table 1
DIFFERENCE BETWEEN PRODUCTION AND CONSUMPTION OF MAIN AGRICULTURAL PRODUCTS AND FOOD SUPPLIES IN THE EAEU MEMBER-STATES, THOUSAND TONS

Name of Product	Republic of Armenia	Republic of Belarus	Republic of Kazakhstan	Kyrgyz Republic	Russian Federation
Cattle meat	-5.4	118.2	-14.6	-0.2	-631.7
Pork	-7.1	-21.5	-6.9	-3.5	-371.8
Poultry meat	-30.7	82.7	-154.1	-58.7	-392.9
Butter	-5.1	68.2	-10.3	0.5	-145.2
Cheese and cottage cheese	0.3	156.1	-21.6	0	-290.9
Potatoes	15.9	191.7	-50.1	-32.6	-651.6
Vegetables	-8.1	-23.7	-276.6	51.4	-1749.4
Grapes	7.1	-30.1	-85.7	-0.2	-357.8
Melons and watermelons	1.2	-20	-51.1	1.5	-6.1
Apples and Pears	1.5	-129.8	-170	21.8	- 142.,2
Sausages	-5.4	48	-33.5	-1.7	-13.7
Vegetable oil	-23.3	39.5	-49.3	-49.6	2361.5
Sugar	-100	168.4	-494.7	-82.7	-1000.6

Source: “Monitoring Food Security in the EAEU Member-States: 2016” (2017).

According to received data, the best food supply is in the Republic of Belarus, the worst one–in the Republic of Kazakhstan. However, other states have an absolute majority of negative indicators. If the data on these states are arranged according to decrease in food supplies, the following order will be: the Republic of Belarus, Kyrgyz Republic/Republic of Armenia (insignificant difference), Russian Federation and the Republic of Kazakhstan. The Russian

Federation satisfies own demands for food only with vegetable oil. This situation makes these states import-dependent. If there is on food supplies from abroad, the food crisis may begin.

At the same time, these data show that EAEU member-states cannot provide each other with missing products. They are forced to buy products from countries that are not members of the Eurasian Economic Union. However, not all indicators are critical. The deficit of certain goods is insignificant (for example, cheese and cottage cheese in the Republic of Armenia; pork in the Republic of Kazakhstan; cattle meat and butter in Kyrgyz Republic; melons and watermelons in Russian Federation). However, there is also a lack of certain products, namely–a significant deficit (for example, sugar in the Republic of Armenia, the Republic of Kazakhstan, Kyrgyz Republic and in Russian Federation; apples and pears in the Republic of Belarus). According to received data, sugar is the item of short supply in most states.

Studying the international experience proves that most favorable conditions for the production of foodstuffs should be provided for all producing regions with appropriate climatic conditions (Ferraro et al., 2016). It is advisable to support self-sustaining regions in their production activities and desire to transform into the producing (exporting) ones. One should try to find individual solutions in each case in order to enhance food supply security of consuming (importing) regions. Some regions need to develop production, others need to improve the delivery system from other regions (depending on the existing climatic conditions).

Food supply security in any region requires a combination of national and local actions. All regions should meet the challenges of independent securement of foodstuffs that have short shelf life or which cannot be transported etc. These products include unskimmed milk, fresh meat and eggs, rathe-ripes, fresh berries and fruit. Development of inter-regional food supply requires a system of state guarantees regarding risks of non-payment, increase in food productivity, and the possibility to introduce innovative ideas. In general, provision of inter-regional supply is feasible and, in some regions, presents an established and traditional process.

Climate change is a topical issue for the Republic of Armenia, the Republic of Kazakhstan and for Kyrgyz Republic (Central Asia). Common climatic features in Central Asia include great solar radiation, sharply continental and arid climate, substantial daily temperature spans, frequent climate inversions, cold winters and hot summers, highly developed local air circulation and smog. Yields may vary due to weather variability. Countries of this region are subjected to similar climatic impacts and they cannot provide each other with foodstuffs given unfavourable situation.

Russian Federation is a major supplier for the Republic of Armenia, the Republic of Kazakhstan and for Kyrgyz Republic. Cooperation with the Russian Federation in order to ensure food supply security through food import may be politically risky. Central Asian countries require substantial food reserves and mechanisms of their accumulation, storage and distribution.

Special attention should be paid to the infrastructure sector, represented by organizations and institutions dealing with standardization, certification and metrology. This part of cluster should guide the process, organize rules and standards, ensure clarity and uniformity of requirements aimed at assuring food production quality and security. Currently, Kazakhstan designated the Coordinating Council for the Development of Clusters in the Food Industry as well as a number of territorial workgroups on specific cluster areas.

Analysis of best international practices reveals the fundamental benefit of the cluster approach in ensuring food supply security. This approach gives the possibility to use full potential of all productive forces (aimed at food production) at the national level as a single

intelligent system, which is able to identify regional features along with relevant adaptation. Enterprises of all forms of ownership can be easily integrated in a cluster. The main objective of cluster units is transition towards more effective cooperation for further development of food economy and parallel solving basic problems of every business entity aimed at ensuring profitable operations.

Food security studies are prospective by nature. The world population is growing permanently. Over the last 60 years, the world population tripled and it will reach 9 billion by 2050.

According to FAO data, the number of people suffering from hunger decreased to 795 million people in 2015 (World hunger falls to under 800 million, eradication is next goal, 2015). However, it can be seen that progress has been achieved mainly due to the growth of food supply security in such Asian countries as India and China. In Africa, the problem of malnutrition only exacerbated.

It is estimated that agricultural potential of the world is sufficient to provide food at the level of 2500 kcal per day per inhabitant of the Earth. Nevertheless, levels of food supply security in various countries are not equal (Shevkunova, 2014). Thus, studies carried out in late 1990s showed that the average level of consumption in the world made 2700 kcal/day per person; residents of the US and Canada consumed 3600 kcal; citizens of all Western European countries–3500 kcal; the USSR citizens received 3400 kcal. That considerably exceeded the norm. At the same time, people in tropical Africa consumed 2100 kcal/day, residents in India-2200 kcal/day per capita (Micha et al., 2015). In these regions, the average level was even lower than the average level of consumption in the world, excluding hundreds of millions of malnourished and even starving ordinary people. Although reasonable distribution of produced food on 1.5 billion hectares of farming lands could provide full ration for every human being on the planet (Less than half of the land surface is suitable for agriculture, including natural pastures; the actual potential of cultivated lands makes about 3000 million hectares, 1.442 million hectares of which are already cultivated; possible increase of cultivated lands makes about 500 million hectares (Goncharov, 2015).

Unfortunately, within the next 20–50 years, one should not expect significant improvement of this situation in the world. In order to feed hundreds of millions of undernourished people it would be enough to grow additionally 120-150 million tons of grain. Although, now this task is quite feasible, it depends directly on goodwill of countries with surplus resources (OECD, 2009).

Similar situation is observed in EAEU states; there are positive trends. Countries of this region theoretically could increase food production, however, they face similar problems along with other countries. Significant part of lands are not usable due to the loss of fertility. Increase or decrease in crop acreage and export volumes depends on market conditions.

The states of the Eurasian Economic Union regularly face the fact that the price for grain is low in the world market. Their Governments make efforts in order to provide new ways to export grain ensuring competitiveness of its products. However, they have only one possibility to use their potential. One cannot agree with the fact that export is the only right way. Grain processing and storage on the territory of the state and its use for livestock development and deep grain processing is another alternative. Grain export should be carried out only under favorable market conditions.

Most importing countries currently do not have sufficient grain reserves and their situation in terms of food security will not improve in the near future. Global processes lead to an

increase of world prices for agricultural products (for example, Uruguay Round of GATT and the WTO Agreement on Agriculture, which stipulated gradual reduction of agricultural subsidies). Policy aimed at reducing export subsidies for food exporters can also lead to reduction in foodstuff production in exporting countries (primarily in Western Europe), which will aggravate the problem of the world food supply security.

EAEU states have large areas of plowed fields. However, they do not use them in full for various reasons. In European part of Russian Federation, many lands are not used or cultivated to improve soil due to irrational agricultural management. In Armenia, Kazakhstan and Kyrgyzstan, as well as in the Asian part of Russian Federation, climatic and soil conditions are nit favorable to produce more food. The Central Asian region is also characterized by high fluctuations in yield, which are also determined by climate. Providing significant amount of food is a priority for these states. One should pay attention to new technologies, creation of large greenhouse facilities and irrigation. By the example of Kazakhstan, we can conclude that economic orientation at the production of monocultures is not always effective. Kazakhstan produces grain in volumes, which exceed domestic needs by a factor of several times. Substantial amount of grain is exported. Products after deeper processing are imported to Kazakhstan. Kazakhstan should make serious efforts to reorient the flow of exported grain to ensuring domestic demand for other food products such as meat, poultry, fish, etc.

Future complications related to food supply security in the world will be caused by the environmental factor. At present, we can see effects of intensive farming, such as soil erosion, changes in the level of ground water, accumulation of pesticides in soil, loss of soil fertility, etc. In 1980s, these factors caused agricultural productivity slowdown in the whole world, including EAEU member-states (Anfinogentova, 2014). According to FAO estimates, in 50 years 544 million hectares of agricultural lands, which are currently used in Asia, Africa and Latin America, will be forcedly withdrawn from use. The worst situation with fertility of plowed fields is observed today in Africa, Asia and Europe, and the highest potential of natural soil fertility is preserved in South America (Gorokhov, 2014).

Among these global problems being solved within the framework of international organizations, shortage of fresh water, which is used for irrigation, is very significant. Fresh water suitable for irrigation makes a very small part of the global water resources. Agriculture has always been the main consumer of fresh water (it consumes two-thirds of used water). In recent years, both industrialized countries and the developing economies have begun to experience shortage of water for irrigation purposes (Seydazimova and Aitbaev, 2016).

Keeping in mind duality of the world food situation, the issue of food supply security requires greater attention of international institutions, intergovernmental organizations and management structures, governments of individual countries, leading scientists and civil society organizations.

CONCLUSION

In the course of the research, we have studied the world experience in food security provision. In this respect, the leading role is currently played by the UN, European Union, and by the World Health Organization. These institutions develop practical recommendations with the view of improving food security of all states. In particular, this refers to the developing economies. However, food security provision is relevant for the developed countries, characterized by urbanization and industrialization. Special attention is given to agricultural activities, which should be seen not only as a source of food for the population, but also as

fodder, which is critical for animal husbandry providing meat and dairy products. One should develop alternative sources of food supply with a view to provide food security in the case of major disasters.

We have calculated a difference to determine the condition of self-sufficiency of countries in terms of food for the population. Calculations are based on production and consumption data of main agricultural products and food supplies in the EAEU member states in 2014, provided by the Eurasian Economic Commission that was monitoring food security in the EAEU. According to received data, the best food supply is in the Republic of Belarus, the worst one–in the Republic of Kazakhstan. However, other states have an absolute majority of negative indicators. This situation makes these states import-dependent. If there is on food supplies from abroad, the food crisis may begin. At the same time, these data show that EAEU member-states cannot provide each other with missing products. They are forced to buy products from countries that are not members of the Eurasian Economic Union.

Hence, the regions can be divided into three groups in terms of performance data: regions with the largest food production potential, regions that are self-sufficient in food production, consuming (importing) or under-provided regions.

Enhancement of food sovereignty aimed at ensuring food supply security of the EAEU states is viewed as possible and promising in the current global situation. Primarily, efforts should be directed at modernization and development of the food industry. In particular, the following areas should be developed: agriculture, with obligatory crop and livestock development; food engineering; manufacturing facilities; infrastructure branches; marketing organizations; other areas, accompanying the development of relevant productive forces.

Creation of clusters, located within regions along with using features and competitive advantages of location should be considered as the main tool for development, based on international experience. In each case, one should apply individual approaches to the formation of clusters, based on the existing infrastructure and relevant situation. It affects productivity improvement, creates opportunities for innovation and fosters new business. Enterprises of all forms of ownership can be easily integrated in a cluster. The main objective of cluster units is transition towards more effective cooperation for further food industry development and parallel solving basic problems of every business entity aimed at ensuring profitable operations.

REFERENCES

Anfinogentova, A. (2014). Interdisciplinary approach to the substantiation of national food safety program. *The Economist*, (8), 40-47.

Bachev, H. (2016). A framework for assessing sustainability of farming enterprises. *Journal of Applied Economic Sciences, 11*(1), 24-26.

Barling, D. & Duncan, J. (2015). The dynamics of the contemporary governance of the world's food supply and the challenges of policy redirection. *Food Security, 7*(2), 415-424.

Barthel, S. & Isendahl, C. (2013). Urban gardens, agriculture, and water management: Sources of resilience for long-term food security in cities. *Ecological Economics, 86*, 221-234.

Baum, S., Denkenberger, D & Pearce, J.M. (2016). Alternative foods as a solution to global food supply catastrophes. *Solutions, 7*(4), 31-35.

Béné, C., Arthur, R., Norbury, H., Allison, E.H., Beveridge, M., Bush, S., Campling, L., Leschen, W., Little, D., Squires, D., Thilsted, S.H., Troell, M. & Williams, M. (2016). contribution of fisheries and aquaculture to food security and poverty reduction: Assessing the current evidence. *World Development, 79*, 177-196.

Bojnec, Š. & Fertő, I. (2015). Does enlargement has caused intra and extra European Union agri-food trade? *Bulgarian Journal of Agricultural Sciences, 21*(1), 1-15.

Brief review of the poultry industry of Kazakhstan (2010-2015). In Marketing Handbook Kazdata.

Brown, M.E., Antle, J.M., Backlund, P.W., Carr, E.R., Easterling, W.E., Walsh, M. & Dancheck, V. (2015). climate change and global food security: food access, utilization, and the US food system. *AGU Fall Meeting Abstracts*.

Dankov, A.G. (2013). Development of Turkmenistan's economy in the first years of independence (1992-1998). *Tomsk State University Journal*, (374).

Davletov, S.R. & Egamberganova, M.J. (2015). Food security issues in Uzbekistan. *European journal of law and political sciences*, *15*(2), 38-43.

Delzeit, R., Zabel, F., Meyer, C. & Václavík, T. (2016). Addressing future trade-offs between biodiversity and cropland expansion to improve food security. *Regional Environmental Change. 17*(5), 1429-1441.

Elemesov, R. & Ondash, A.O. (2015). Introduction to economic global studies: Food problem. *Bulletin of KazNU. International relations and international law*, *1*(69).

Ferraro, V., Piccirillo, C., Tomlins, K. & Pintado, M.E. (2016). Cassava (Manihot esculenta Crantz) and yam (Dioscorea spp.) crops and their derived foodstuffs: safety, security and nutritional value. *Critical reviews in food science and nutrition*, *56*(16), 2714-2727.

Food aid convention. (1999). In Food Aid Convention.

Food Safety Enhancement Act. (2009).

Food Safety Modernization Act. (2011). In 11th Congress Public Law, 353.

Goncharov, V. (2015). Import substitution in the food complex. *The Economist*, (3), 24-31.

Gormley, R. (2016). Greening the global food supply chain through innovation in food science & technology. *In 18th IUFOST Congress*.

Gorokhov, A.A. (2014). Investments in research and development as the main factor for food supply security: The experience of the United States. *National Interests: Priorities And Security*, (18), 49-60.

Grafton, R.Q., Daugbjerg, C. & Qureshi, M.E. (2015). Towards food security by 2050. *Food Security*, *7*(2), 179-183.

Gustafson, D., Gutman, A., Leet, W., Drewnowski, A., Fanzo, J. & Ingram, J. (2016). Seven food system metrics of sustainable nutrition security. *Sustainability*, *8*(3), 196.

Kagan, C.R. (2016). At the nexus of food security and safety: Opportunities for nanoscience and nanotechnology. *ACS Nano*, *10*(3), 2985-2986.

Kang, H. (2015). A study on the relationship between international trade and food security: Evidence from less developed countries (LDCs). *Agricultural Economics (Zemědělská Ekonomika), 61*(10), 475-483.

Kardooni, R., Yusoff, S.B. & Kari, F.B. (2016). Renewable energy technology acceptance in Peninsular Malaysia. *Energy Policy*, *88*, 1-10.

Kareem, O.F., Brümmer, B., & Martinez-Zarzaso, I. (2015). The implication of european union's food regulations on developing countries: Food safety standards, entry price system and Africa's export. *Research in Agricultural & Applied Economics*.

Khoury, C.K., Bjorkman, A.D., Dempewolf, H., Ramirez-Villegas, J., Guarino, L., Jarvis, A., Rieseberg, L.H. & Struiket, P.C. (2014). Increasing homogeneity in global food supplies and the implications for food security. *Proceedings of the National Academy of Sciences*, *111*(11), 4001-4006.

Lazarevna, D.E., Yurievna, B.S., Gennadyevich, A.S. & Aleksandrovna, K.T. (2017). Estimation of the regional food market state in the context of import substitution. *Academy of Strategic Management Journal*, *16*, 20.

Massawe, F., Mayes, S. & Cheng, A. (2016). Crop diversity: An unexploited treasure trove for food security. *Trends in Plant Science, 21*(5), 365-368.

Micha, R., Khatibzadeh, S., Shi, P., Andrews, K.G., Engell, R.E. & Mozaffarian, D. (2015). Global, regional and national consumption of major food groups in 1990 and 2010: A systematic analysis including 266 country-specific nutrition surveys worldwide. *BMJ open*, *5*(9), e008705.

Monitoring food security in the EAEU member-states: 2014. (2015). *In Eurasian Economic Commission*, Moscow, 35.

Mujahid, I. & Kalkuhl, M. (2015). Do trade agreements increase food trade? *The World Economy*.

OECD. (2009). Agricultural policies in emerging economies. *Monitoring and evaluation*. France.

Porter, J.R. & Xie, L. (2014). Food security and food production systems. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 485-533.

Porter, S.D., Reay, D.S., Higgins, P. & Bomberg, E. (2016). A half-century of production-phase greenhouse gas emissions from food loss & waste in the global food supply chain. *Science of The Total Environment*, *571*, 721-729.

Protracted conflicts causing alarming spikes in severe hunger. (2016). *Food and Agriculture Organization of the United Nations*.

Reese, A. (2017). Blackouts cast Australia's green energy in dim light. *Science*, *355*(6329), 1001-1002.

Seydazimova, D. & Aitbaev, T.E. (2016). Water-saving technologies: The basis for efficient development of irrigated olericulture in Kazakhstan. *Proceedings of the National Academy of Sciences of the Republic of Kazakhstan, Agrarian Sciences*, (2), 73-80.

Shevkunova, E.S. (2014). Analysis of the level of food consumption. *Scientific Journal of KubSAU*, 101.

Tai, A.P.K., Martin, M.V. & Heald, C.L. (2014). Threat to future global food security from climate change and ozone air pollution. *Nature Climate Change*, *4*(9), 817-821.

Tendall, D.M., Joerin, J., Kopainsky, B., Edwards, P., Shreck, A., Le, Q.B., Kruetlia, P., Grantc, M. & Six, J (2015). Food system resilience: Defining the concept. *Global Food Security*, *6*, 17-23.

Teslenok, S.A. (2015). Geoinformation-cartographic application of management solutions in agricultural environmental management. *Young Scientist*, 59.

Transforming our world: The 2030 agenda for sustainable development. (2015). *In General Assembly on 25 September 2015*.

van Zanten, H.H.E., Mollenhorst, H., Klootwijk, C.W., van Middelaar, C.E. & de Boer, I.J.M. (2016). Global food supply: Land use efficiency of livestock systems. *The International Journal of Life Cycle Assessment*, *21*(5), 747-758.

World hunger falls to under 800 million, eradication is next goal. (2015). Food and agriculture organization of the United Nations.

Zoidov, K.H. & Medkov, A.A. (2015). Evolutionary-institutional approach in the study of implementation of major energy projects and water issues in Central Asia. *Electronic Journal of Market Economy Institute of Russian Academy of Sciences*, (1), 54-68.