

Growth of agro-industrial complex in modern economic conditions

Crecimiento del complejo agroindustrial en condiciones económicas modernas

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Abstract

The long-term, stable development of the country, the standard of living of its population is primarily influenced by the ability of the state to fully meet the basic needs of the population, a prominent place among which is the nutritional requirement. At the same time, the level of meeting the population's nutritional requirements is put into practice through the assessment of such a category as food security. Its sustainability to a great extent depends on the success of the development and functioning of the agro-industrial complex of the country, which is constantly affected by climatic factors, economic and financial, as well as political ones. The introduction of quarantine worldwide in connection with the spread of coronavirus infection is a striking example of this impact, which ultimately has shown the need to ensure high food security and made this study relevant. In consideration of the foregoing, in this research we have revealed the level of food supply in the world, as well as studied the countries with the highest and lowest levels of food sustainability. Along with this, the scientific study has determined the volume of the gross value added of the agricultural industry in the context of basic prices, as well as the level of investment in agriculture in European countries, which made it possible to draw conclusions concerning the level of development of the agricultural sector in the represented countries and to monitor the interconnections with changes in food security level and gross value added in the industry over the outlined period. The level of exports and imports in Europe for 2010-2019 has been determined by forming a forecast of changes in the balance between these indicators for 2020-2022. Methods of analysis, synthesis, formalization, logical abstraction, theoretical cognition, monographic, systematization, abstract-logical and others have been used to carry out the investigation. As a result of the analysis performed in the academic paper it has been established that it is necessary to stimulate the development of the agro-industrial complex in Asia, Africa, Latin America and the Caribbean. One of the tools for such stimulation is the implementation of the strategy for the development of the agro-industrial complex for the long-term perspective, along with the use of tactical programs and measures to achieve common development goals. At the same time, the study has determined that the



development and implementation of the strategy should be carried out in symbiosis with international, regional, state and municipal strategies; it is a key factor for their success.

Keywords: Food Security, Agro-Industrial Complex, Food Sustainability, Level of Malnutrition, Gross Value Added of the Industry, Agro-Industrial Development Strategy, Self-Sufficiency, Gross Fixed Capital Formation in Agriculture.

Resumen

El desarrollo estable a largo plazo del país, el nivel de vida de su población está influenciado principalmente por la capacidad del estado para satisfacer plenamente las necesidades básicas de la población, un lugar destacado entre los que se encuentra el requerimiento nutricional. Al mismo tiempo, el nivel de satisfacción de las necesidades nutricionales de la población se pone en práctica mediante la evaluación de una categoría como la seguridad alimentaria. Su sostenibilidad depende en gran medida del éxito del desarrollo y funcionamiento del complejo agroindustrial del país, el cual se ve constantemente afectado por factores climáticos, económicos y financieros, así como políticos. La introducción de la cuarentena en todo el mundo en relación con la propagación de la infección por coronavirus es un ejemplo sorprendente de este impacto, que en última instancia ha demostrado la necesidad de garantizar una alta seguridad alimentaria y ha hecho que este estudio sea relevante. En consideración a lo anterior, en esta investigación hemos revelado el nivel de suministro de alimentos en el mundo, así como también hemos estudiado los países con los niveles más altos y más bajos de sostenibilidad alimentaria. Junto a esto, el estudio científico ha determinado el volumen del valor agregado bruto de la industria agrícola en el contexto de precios básicos, así como el nivel de inversión en agricultura en los países europeos, lo que ha permitido sacar conclusiones sobre el nivel del desarrollo del sector agrícola en los países representados y monitorear las interconexiones con los cambios en el nivel de seguridad alimentaria y el valor agregado bruto en la industria durante el período señalado. El nivel de exportaciones e importaciones en Europa para 2010-2019 se ha determinado formando una previsión de cambios en el equilibrio entre estos indicadores para 2020-2022. Para llevar a cabo la investigación se han utilizado métodos de análisis, síntesis, formalización, abstracción lógica, cognición teórica, monográfica, sistematización, abstracto-lógico y otros. Como resultado del análisis realizado en el trabajo académico se ha establecido que es necesario estimular el desarrollo del complejo agroindustrial en Asia, África, América Latina y el Caribe. Una de las herramientas para tal estímulo es la implementación de la estrategia para el desarrollo del complejo agroindustrial con una perspectiva de largo plazo, junto con el uso de programas y medidas tácticas para lograr objetivos de desarrollo comunes. Al mismo tiempo, el estudio ha determinado que el desarrollo e implementación de la estrategia debe realizarse en simbiosis con las estrategias internacionales, regionales, estatales y municipales; es un factor clave para su éxito.

Palabras clave: Seguridad Alimentaria, Complejo Agroindustrial, Sustentabilidad Alimentaria, Nivel de Desnutrición, Valor Agregado Bruto de la Industria, Estrategia de Desarrollo Agroindustrial, Autosuficiencia, Formación Bruta de Capital Fijo en Agricultura.



Introduction

Efforts to ensure the stability of the functioning and sustainable development of all spheres of state activity is a priority for every country in the world. This applies not only to supporting economic development, ensuring stable positions in the world market, but also to basic needs, which in turn, affects the comprehensive nature of the issue. One of such areas, which, without exaggeration, acts as the foundation for ensuring the sustainability of state activities in the long-term perspective is food security. After all, the lack of safe living conditions, in particular food security, completely eliminates the urgency of meeting the needs of the highest level. Food security is gaining particular relevance in the face of constant exposure to countless threats to the external and internal environment with varying intensity degrees.

Considering the issue of food security, it is obvious that the basic factor in ensuring it is the success of the agro-industrial complex of the country (AIC) in general, and agriculture, in particular. In support of this viewpoint, we note the thesis of a government agency called SIDA, according to which agriculture is vital for survival and one of the basic sources of food, especially for poor people in rural areas (SIDA, 2018). Every country in the world, according to viewpoint of Akimova et al. (2020) most often supports the social-economic development of areas, including rural areas, which are the basis for agricultural development. This not only allows increasing the living standards of the population in rural areas and ensuring an adequate level of competitiveness in rural areas, but also greatly stimulates the formation of sustainable industrial safety.

Akimova et al. (2020) consider that every country in the world most often supports the social-economic development of areas, in particular rural areas, which are the basis for agricultural development. This makes it possible both to increase the living standards of the population in rural areas and ensure an adequate level of competitiveness in rural areas, as well as it also greatly stimulates the formation of sustainable industrial safety. At the same time, the events of 2020, in particular the global quarantine, caused by the spread of the coronavirus infection, once again have proven the need to reconsider approaches to formation the country's food security, due to sharp food shortages in certain regions affected by general panic and border closures. Taking into account the circumstances concerned, the requirements for ensuring the national security of the world are growing significantly, along with the formation of their economic security, and in particular its basic part - food. After all, the fact that

food security is the basis of the national security of any country in the world affects the strengthening of its influence on the level of security not only of poor but also developed countries.

Literature review

The study of the available scientific literature on food security, in the context of stimulating the development of agriculture, makes it possible to draw conclusions concerning the high degree of coverage of this issue. In particular, USAID (2019) has emphasized that food security means physical and economic access to sufficient food amount in order to meet needs at a level sufficient for productive and healthy living at all times. At the same time, food insecurity is often connected with poverty and has a long-term impact on the ability of families, communities and countries to develop and prosper. In addition, prolonged malnutrition inhibits growth, slows cognitive development and increases susceptibility to disease.

Therewith, Pawlak and Kołodziejczak (2020) note that despite the various measures taken to eliminate the problems of food insecurity and malnutrition, it remains a serious issue in numerous countries. The situation is especially critical in countries where population growth is combined with the spread of environmental disasters in the form of floods, droughts, temperature variability or frequent precipitation. In addition, due to growing demand for food and declining crop productivity in such conditions, it provokes an increase in food prices, which in case of income inequality of different segments of the population negatively affects the availability of food, in particular for poor households.

At the same time, Altuhov (2011), emphasizes that the agro-industrial complex is one of the most important sectors of the country's economy. Therefore, the solution to the issue of improving the living standards of the population and ensuring food security of the country depends on the sustainability of its development, including its key part - agriculture.

Askar et al. (2018) adhere to a similar opinion in their studies, noting that within the agro-industrial complex, food is produced to meet the needs of the population, which in turn forms a certain level of food security of the country.

Moreover, according to a study conducted by the Deutsches Institut für Entwicklungspolitik (2020), the livelihoods of most non-food unsecured households around the world are still largely based on agricultural activities. The growth of the agricultural sector has a much greater impact on



food security than the growth of any other sector of the economy. Thus, agriculture can play a key role in numerous countries in order to accelerate overall economic growth and create new jobs. One of the central goals of a developing country is to achieve the status of a high-income country, according to viewpoint of Yifu Lin (2018). Agriculture plays a critical role in transforming the economy to achieve this goal alongside other important development goals, such as food security and nutrition improvement. That is why, in order to bring an end to hunger and malnutrition while accelerating economic growth, it is necessary to carry out the transformation of agriculture.

Kruzlicika (2014) elucidating the issue of achieving a high level of food security has noted that it is based on sustainable agricultural production and resource management. In this context, the author has highlighted the most important issues in the formation of food security, in particular: production within the conditions of soil degradation and limited fresh water, the application of sustainable production methods to protect resources, losses within the food chain, and the sale of food from households. Therefore, taking into account the above mentioned, it becomes obvious the need to focus on the development of the agro-industrial complex as a basis for increasing the level of food security of the country.

Data and methods

The scientific works of domestic and foreign

researchers, official statistics, reports, which form conclusions concerning the level of malnutrition in the world, the parameters of global food sustainability, as well as the level of agricultural industry in selected countries constitute the methodological basis of the study. Methods of analysis, synthesis, formalization, logical abstraction, theoretical knowledge, monographic, systematization, abstract-logical and other methods have been used in the study. For the purposes of the study, data from the Food and Agriculture organization of the United Nations, Global Executive Summary, Food Sustainability Index and Eurostat have been used.

Results of the study

An important and complex challenge for the leadership of countries in the direction of the formation of food security is to meet the requirements of its population for food at least at a minimum level through its own production. At the same time, increasing the level of self-sufficiency in food is one of the key prerequisites for food security; therefore, the assessment of its level is an important indicator used in the formation of a set of protectionism measures to support the country’s own agro-industrial complex and regulate exports and imports on the way to achieving the highest possible level of self-sufficiency. Therefore, we begin the study by determining the degree of Prevalence of undernourishment (PoU) by regions of the world in 2005–2018 in the world, 2005-2018, formatting the results using the Table 1.

Table 1. Prevalence of undernourishment (PoU) by regions in 2005–2018 in the world for 2005-2018 period (%)

Region	2005	2010	2015	2016	2017	2018
Africa	21.2	19.1	18.3	19.2	19.8	19.9
Northern Africa	6.0	5.0	6.9	7.0	7.0	7.1
Sub-Saharan	24.3	21.7	20.9	22.0	22.7	22.8
Eastern Africa	34.3	31.2	29.9	31.0	30.8	30.8
Asia	17.4	13.6	11.7	11.5	11.4	11.3
Central Asia	11.1	7.3	5.5	5.5	5.7	5.7
Eastern Asia	14.1	11.2	8.4	8.4	8.4	8.3
South-eastern Asia	18.5	112.7	9.8	9.6	9.4	9.2
Southern Asia	21.5	17.2	15.7	15.1	14.8	14.7
Western Asia	9.4	8.6	11.2	11.6	12.2	12.4
Western Asia and Northern Africa	8.0	7.1	9.2	9.5	9.8	9.9
Latin America and the Caribbean	9.1	6.8	6.2	6.3	6.5	6.5
The Caribbean	23.3	19.8	18.3	18.0	18.0	18.4
Latin America	8.1	5.9	5.3	5.5	5.7	5.7
Oceania	5.5	5.2	5.9	6.0	6.1	6.2
Northern America and Europe	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5

Source: The author’s own development based on the Food and Agriculture organization of the United Nations (2020)

Thus, according to the data presented in the table, the highest degree of malnutrition of the population is naturally observed in the African region, as well

as in the Caribbean. In particular, the studied indicator acquires the greatest value in the context of East Africa and Sub-Saharan Africa, with an



identical tendency to decrease between 2005-2015, and also its gradual growth since 2016. Herewith, in terms of the Asian region, the percentage of malnutrition had a clear tendency to decrease from 17,4% in 2005 to 11,3% in 2018. An ambiguous tendency is observed in Latin America and Oceania, where the rate of malnutrition decreased until 2015, and it began to grow gradually in 2016. However, at the time of its highest value, the

malnutrition rate did not exceed 7%, which has been a positive trend. The final region reflected in the table is North America and Europe, where the value of the studied indicator during the whole sampling period was less than 2,5%.

At the same time, in quantitative terms, the number of malnourished people in the world is reflected in Figure 1.

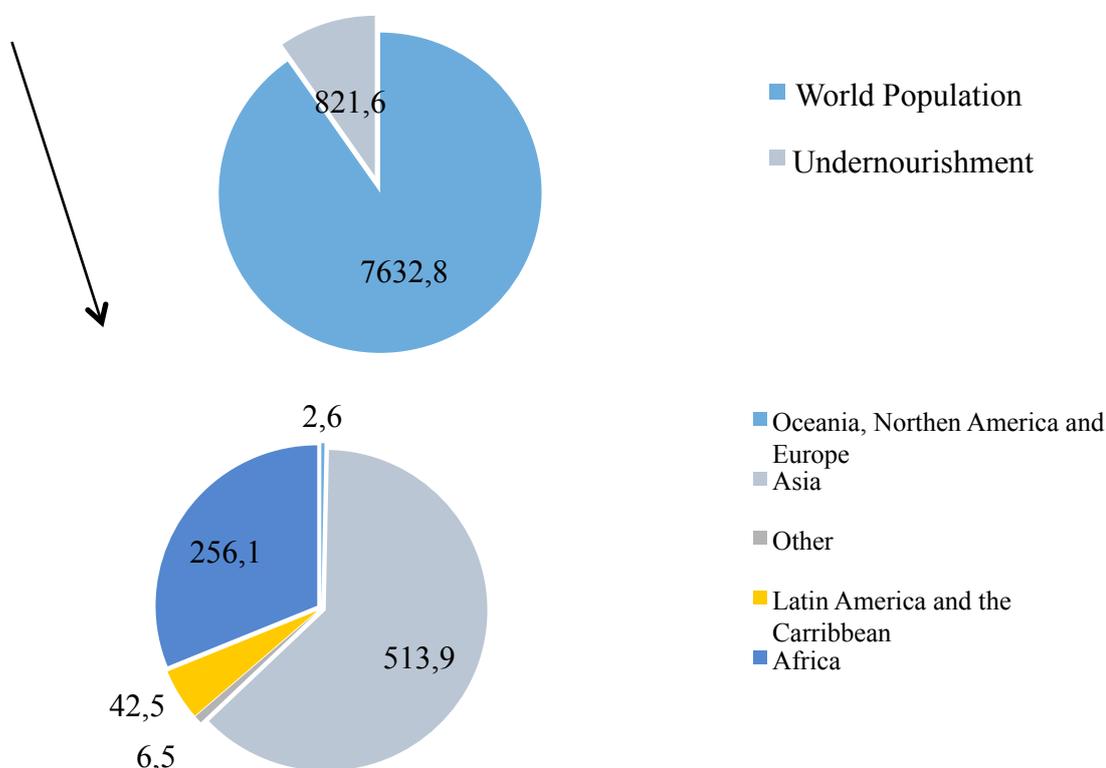


Figure 1. Distribution of undernourishment in the world by region in 2018 (million people)

Source: The author's own development based on the Food and Agriculture organization of United Nations (2020)

Thus, analyzing the data presented in the figure, we can conclude that in quantitative terms, most people are malnourished in Asia – 513,90 million and Africa – 256,1 million. On the other hand, the smallest number of people, experiencing food shortages, is observed in Oceania, North America and Europe – 2,6 million people, as well as in other regions of the world – 6,5 million people. Latin America and the Caribbean account for 42,5 million starving people. The total amount of the world's

undernourished population as of the end of 2018 is 821,6 million people.

Along with this, in order to ensure a comprehensive consideration of the research topics, we propose to determine the level of food sustainability of the countries of the world by displaying the Food Sustainability Index, indicating ten countries with the highest degree of food sustainability (Table 2) and its lowest level (Table 3).

Table 2. Rating of countries with the highest level of food sustainability according to the Food Sustainability Index for 2017-2018

Country	2017	Country	2018
France	74.8	France	76.1
Japan	72.8	The Netherlands	75.6
Germany	70.5	Canada	75.3
Spain	70.4	Finland	74.1



Sweden	69.7	The Czech Republic	74.0
Portugal	69.5	Japan	73.8
Italy	69.0	Denmark	73.5
South Korea	69.0	Sweden	73.4
Hungary	68.4	Austria	73.3

Source: The author’s own development based on the Global Executive Summary (2017); Food Sustainability Index (2018)

Thus, from the table presented we can conclude that France has the greatest food sustainability, which tracks the annual growth of the Food Sustainability Index. Herewith, we can observe a significant growth of the studied indicator in the example of the Netherlands: this country was outside the rating in 2017, and rose to the 2nd place in 2018. In addition, a similar tendency is observed in Canada, Finland, the Czech Republic, Denmark and Austria. Regarding Japan, the Food Sustainability Index in 2018 increased compared to 2017, but slightly,

which moved the country to 6th place in the rating. Sweden moved from 5th place to 9th place despite the fact that this indicator increased by almost 4%. South Korea and Hungary dropped out of the rating in 2018.

In contrast to countries with a high level of food sustainability, let us consider the list of countries with the lowest level of food sustainability (Table 3).

Table 3. Rating of countries with the lowest level of food sustainability according to the Food Sustainability Index for 2017-2018

Country	2017	Country	2018
Saudi Arabia	57.8	Cameroon	59.7
Egypt	57.1	Indonesia	59.1
Brazil	56.6	Sierra Leone	58.8
Morocco	53.9	Ghana	57.6
Tunisia	53.1	South Africa	56.4
Lebanon	53.1	Saudi Arabia	56.2
Indonesia	52.4	Russia	56.1
India	50.8	Bulgaria	54.5
The United Arab Emirates	40.3	The United Arab Emirates	52.3

Source: The author’s own development based on the Global Executive Summary (2017); Food Sustainability Index. (2018)

Thus, it can be observed from the above table that the United Arab Emirates (UAE) has a low level of food sustainability, despite its significant increase from 40,3% to 52,3%. Food stability in India, Tunisia, Morocco, Brazil and Egypt has increased significantly as dozens of countries with the lowest levels have dropped out. At the same time, the low level of the Food Sustainability Index is observed in Bulgaria, Russia, Saudi Arabia and North Africa. The outlined tendency is explained by the global

growth of food sustainability during 2017-2018, however, differences in the pace of such growth have led to significant shifts among the countries with the lowest level of this indicator.

Along with this, let us draw a parallel with the level of food sustainability, as well as the gross value added of the agricultural sector in the context of basic prices for 2015-2019, drawing up the results of the study using Table 4.

Table 4. Gross value added of the agricultural industry in basic prices

Country	2015	2016	2017	2018	2019
Belgium	2,394.26	2,155.27	2,384.52	1,959.29	2,279.33
Bulgaria	1,620.73	1,776.57	1,922.68	1,873.08	1,912.57
The Czech Republic	1,423.40	1,690.29	1,675.10	1,687.49	1,661.70
Denmark	2,170.27	2,102.97	3,113.35	2,221.28	3,498.99
France	29,614.83	26,284.14	29,825.72	32,988.64	31,270.70
Hungary	3,238.08	3,437.63	3,564.95	3,464.94	3,498.72
The Netherlands	10,157.69	10,653.13	11,743.67	10,681.93	11,230.26
Austria	2,734.16	2,884.41	3,261.80	3,176.77	3,307.31
Finland	1,085.04	1,151.08	1,132.11	1,113.66	1,254.18
Sweden	1,848.56	1,641.82	1,933.42	1,414.44	1,682.58

Source: Eurostat (2020)



Thus, from the table presented we can observe that the gross value added of the agricultural sector in the represented countries had an ambiguous tendency. In particular, in Bulgaria, its gradual growth is taking place, which is ultimately reflected in an increase of its food sustainability to the level of 54,5 in 2018 with a subsequent upward trend. In the Czech Republic, the growth of gross value added of the agricultural sector in 2016 compared to the previous one is observed, and in the future its size fluctuates in the direction of increase or vice versa within 20 million euros. Along with this, it should be noted that the level of food sustainability in the Czech Republic is growing faster than the size of gross value added, which has made it possible to take the 6th place in its level. A controversial tendency is observed in Denmark, France, Hungary, the Netherlands, Finland and Sweden, where the size of the gross value added of the agricultural sector had been growing or declining, reaching a maximum in 2019, which is a positive factor, as it has made it possible for these countries to form a stock of food sustainability just before the global quarantine, which has significantly shaken its level almost worldwide.

Taking into consideration that most countries with a high level of food sustainability and the highest gross value of the agricultural sector are territorially located in the European region, for the completeness of the study, we graph the dynamics of value added of agro-industry, production value index and intermediate consumption in Europe for 2010-2018 (Figure 2).

According to the latest data, the introduction of quarantine has caused a kind of chain reaction in the established supply chains. In particular, due to the closure of borders and restrictions on movement, farmers do not have access to the sales market, which affects the growth of food waste, especially perishable: seasonal fruits, meat, dairy products.

Along with this, there is a significant shortage of labor resources, which due to the closure of borders could not come for seasonal works. According to a study conducted by Coldiretti, an Italian organization representing farmers, more than a quarter of the food that is produced in the country accounts for about 370,000 regular seasonal migrant workers, of which about 100,000, will probably not be able to come to work this year (International Labor Organization, 2020).

However, millions of plantation workers who harvest and process export-oriented products will be most affected, particularly in developing countries. An example of the devastating effects of

quarantine is the recent suspension of one of the world's largest tea auctions in Mombasa, Kenya, which sells tea from numerous East African countries. Insomuch as long-term cessation of trade can have a critical impact on the local, regional and national economy, the direct impact will be felt in all elements of the supply chain from the factories and warehouses to carriers, which will ultimately not only deepen the food crisis in the country, but also lead to a significant increase in unemployment (International Labor Organization, 2020).

Of course, it is not possible to completely avoid the negative impact of processes, taking place in the external and internal environment, however it is possible and necessary to prepare for potential threats. One of such directions of strengthening national security in general, and food security in particular, is the development of agro-industrial complex on the way to increase the country's self-sufficiency in food, forasmuch as food sufficiency is basic factor to meet all other needs of the population. An example of a high level of self-sufficiency is the experience of such countries as the United States and France, where the level of self-sufficiency is about 100%, Germany - 93%, in Italy - 78%; even Japan, poor in fertile soils, maintains a 50 percent level of self-sufficiency (Cavicchi et al., 2016).

As our study has revealed, the situation with food security and the development of the agro-industrial complex is much more critical in the Asian and African regions. Consequently, within the countries of these regions, it is necessary to pursue an active policy to implement the strategy of a developed agro-industrial complex on the way to stimulating the development of agricultural production. After all, it is agriculture that can become a source for the growth of the national economies of these countries, insomuch as in addition to the obvious scale of this sector, its potential for economic growth is demonstrated by the potential of market and non-market subsectors of agriculture, which stimulate high growth rates in other sectors of the economy due to the multiplier effect. GDP increase driven by agricultural growth is at least twice as effective at reducing poverty as GDP growth from other sectors.

For the purposes of stimulating the development of agro-industrial complex within each country, specific laws, regulations, development strategies are adopted at the level of individual regions of the country, their totality and the level of the state as a whole. At the same time, they are closely intertwined with strategies to stimulate the development of the agro-industrial sector by neighboring countries, international organizations



and relevant institutions. In the aggregate, the combination of strategic documents for the development of agro-industrial complex of the

country and the region in general will be displayed with the help of Figure 2.

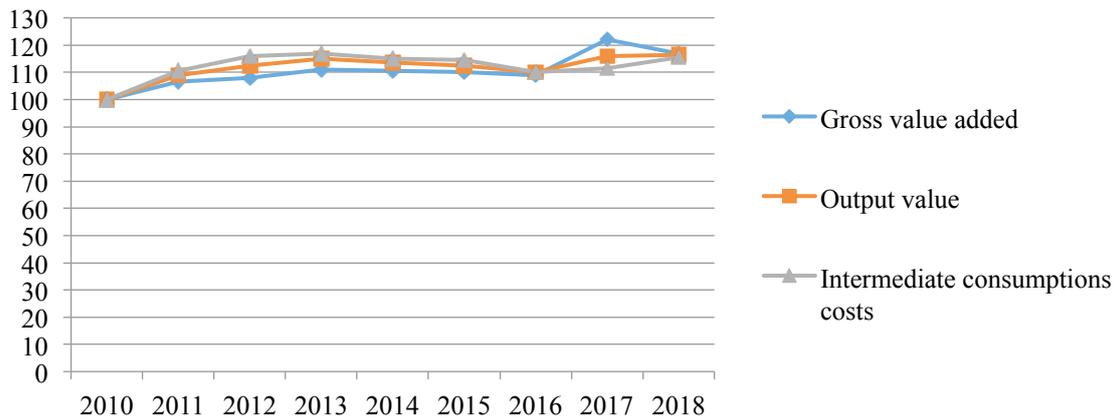


Figure 2. Indices of the value of output, Intermediate consumption costs and value added generation by the agriculture Industry in basic prices

Source: Eurostat (2019)

It is obvious that the amount of value added in European countries reaches its greatest value in 2017, after which it decreases, but remains the largest since 2010. In addition, the value index of products is growing steadily until 2013, after which at the end of 2015 it decreased to the level of 2011. In 2017-2018, its gradual growth is observed. A

similar trend is observed with the amount of intermediate consumption expenditures. At the same time, the level of investment in agriculture is evidenced by the size of the Gross Fixed Capital Formation in agriculture. We propose to investigate the dynamics of its change during 2015-2019 on the basis of Table 5.

Table 5. Gross Fixed Capital Formation in agriculture in 2015-2019 in the European region, million euro

Country	2015	2016	2017	2018	2019
Belgium	95,688.9	99,903.8	103,172.3	109,566.4	:
Bulgaria	9,553.3	8,975.5	9,609.8	10,544.9	:
The Czech Republic	44,997.4	44,257.9	48,370.7	55,485.0	58,703.3
Denmark	54,195.8	59,523.2	62,575.1	66,602.3	68,649.5
Germany	605,941.0	636,421.0	665,889.0	707,719.0	:
Estonia	5,053.5	5,053.8	5,899.1	:	:
Ireland	63,233.0	96,805.0	93,260.2	:	:
Greece	20,490.3(p)	21,284.4(p)	23,243.0(p)	:	:
France	472,647.0	487,384.0	516,780.0	540,761.0(p)	573,096.0(p)
Spain	194,122.0	200,048.0	216,932.0	234,325.0(p)	:
Italy	280,342.1	291,183.5	303,569.9	315,838.4	323,186.9
Hungary	24,999.1	22,663.8	27,916.7	33,677.0	:
The Netherlands	152,533.0	141,675.0	148,670.0	157,502.0	:
Austria	78,137.8	82,594.2	87,258.6	92,426.3	98,136.1
Finland	44,877.0	49,474.0	52,852.0	56,358.0	57,482.0
Sweden	107,929.9	112,749.4	120,688.4	121,822.1	:
The United Kingdom	447,240.4	419,401.3	407,312.9	409,893.6	:

Source: Eurostat (2020)

According to the table, we can see a steady increase in investment in agriculture in countries such as Belgium, the Czech Republic, Denmark, Germany, Greece, France, Spain, Italy, Austria, Finland and Sweden. In such countries as Bulgaria, Estonia, Hungary and the Netherlands, there is a slight decline in investment at the turn of 2015-2016 with further stable growth in 2017-2019. The obtained

trend evidences the stable pace of agricultural development in Europe, as an integral part of the country's agro-industrial complex.

In addition, the rates of development of the agro-industrial complex are evidenced by the indicators of export and import of products obtained as a result of the functioning of the country's agro-



industrial complex. According to Eurostat, the situation at the end of 2018 is as follows (Fig. 3):

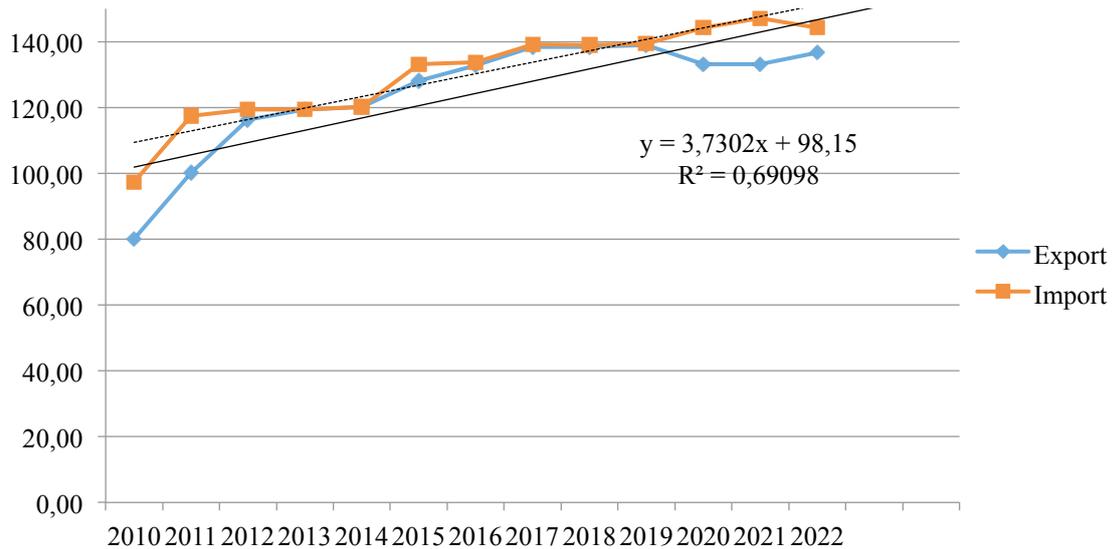


Figure 3. Volumes of exports and imports of agricultural products in the European region

Source: author’s own development based on Eurostat (2019), Heneghan (2020)

From Figure 3 we can conclude that until 2018-2019, the volume of exports and imports of agricultural products tended to equalize.

According to the latest data, the introduction of quarantine has caused a kind of chain reaction in the established supply chains. In particular, due to the closure of borders and restrictions on movement, farmers do not have access to the market, which affects the growth of food waste, especially perishable: seasonal fruits, meat, dairy products.

Along with this, there is a significant shortage of labor resources, which due to the closure of borders could not come for seasonal work. Thus, according to a study by Coldiretti, an Italian organization representing farmers, more than a quarter of the country’s food production is about 370,000 regular seasonal migrant workers, of whom about 100,000 are unlikely to be able to come to work this year. (InternationalLaborOrganization, 2020).

However, millions of plantation workers who harvest and process export-oriented products, particularly in developing countries, will be most affected. An example of the devastating effects of quarantine is the recent suspension of one of the world’s largest tea auctions in Mombasa, Kenya, which sells tea from numerous East African countries. Long-term cessation of trade can have a critical impact on the local, regional and national economy. The direct impact will be reflected in all elements of the supply chain from the factories and warehouses to carriers, which will not only deepen the food crisis in the country, but also lead to a

significant increase in unemployment (International Labor Organization, 2020).

In addition, according to analysts, in the coming years, imports of agro-industrial products to European countries due to the situation described by us will increase, which will affect the formation of a negative trade balance. This will significantly reduce exports. And only by 2022, with the removal of quarantine restrictions, the level of exports and imports will be able to return to the level of 2019.

Of course, it is not possible to completely avoid the negative impact of processes that occur in the external and internal environment, but to prepare for possible threats is possible and necessary. One of such areas of strengthening national security in general, and food security, in particular, is actually the development of agriculture in order to increase the country’s self-sufficiency in food, forasmuch as food adequacy is the basis for meeting all other needs of the population. An example of a high level of self-sufficiency is the experience of such countries as the United States and France, where the level of self-sufficiency is about 100%, Germany - 93%, in Italy - 78%; even poor fertile Japan adheres to 50 percent self-sufficiency (Cavicchi et al., 2016).

As our research has revealed, the situation with food security and the development of the agro-industrial complex is much more critical in the Asian and African regions. Therefore, within the countries of these regions it is necessary to pursue an active policy in order to implement the strategy of agro-industrial complex development on the way



to stimulating the development of agricultural production. After all, agriculture itself can be a source for growth of national economies of these countries, as in addition to the obvious scale of the industry, its ability to ensure economic growth is demonstrated by the potential of market and non-market subsectors of agriculture, which stimulate high growth rates in other sectors of the economy due to the multiplier effect. GDP growth, driven by agricultural growth, is at least twice as effective at reducing poverty as GDP growth from other sectors.

agro-industrial complex within each country, specific laws, regulations, development strategies are adopted at the level of individual regions of the country, their totality and the level of the state as a whole. At the same time, they are closely intertwined with strategies in order to stimulate the development of the agro-industrial sector by neighboring countries, international organizations and relevant institutions. In generalized form, the combination of strategic documents for the development of agro-industrial complex of the country and the region in general will be displayed with the help of Figure 4.

For the purposes of stimulating the development of

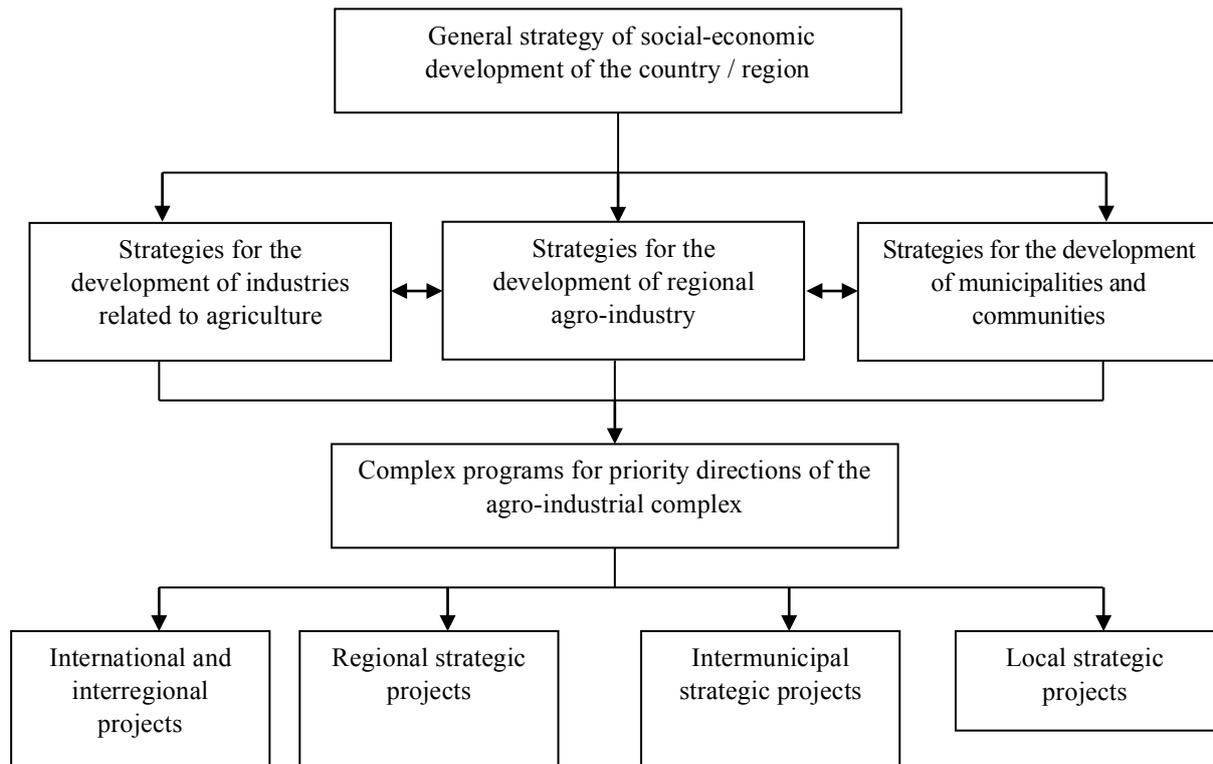


Figure 4. The structure of strategic documents for the development of agriculture within the country and within the region

Source: The author's development based on Kovshov et al. (2019)

Consequently, as it has been reflected in the figure, the basic document that should contain the expected strategic goals is usually the Strategy of social-economic development of the region for the long term period (at the turn of 2020, development strategies until 2030 are adopted). Within the framework of this document, from eight to ten key indicators of the development of the agricultural sector (indicators of the first level) are determined, which have the most significant impact on the economic and social conditions of the region, as well as national strategic goals and challenges. Strategy development is based on a hierarchical principle. The goals and strategic initiatives for the development of the agricultural sector, identified at the national level, are the basis for further

development of strategies at the level of municipalities, urban areas, strategies for the development of regional agricultural industry, as well as sectors related to agriculture (Malinoshevska, 2019).

At the same time, the regional strategy of agricultural development should include the mission, vision, development goals of the second level, which contribute to the achievement of the first level indicators, as well as setting priorities for further development of the agricultural industry. On the basis of the agro-industrial complex development strategy, a package of integrated programs and subprograms for the development of individual agricultural sectors is being developed



with detailed goals (indicators of the third level). These programs, in turn, are designed to become the basis for the development of a set of strategic and investment projects for agricultural development at the international, national, interregional, regional and municipal levels. The use of the aforementioned set of tools, combined with the creation of tax and customs benefits for agricultural producers, assistance in attracting foreign investment in the agricultural industry, and the use of innovative technologies, will allow in the near future to strengthen the country's agro-industrial complex on the way to the formation of a sustainable long-term level of food security.

Discussion

Based on the study conducted, it has been established that a high level of achieved food security is a guarantee for the successful functioning and development of the state in the long term perspective. Consequently, it is necessary to pursue an active policy to stimulate the growth of food sustainability, which is to a great extent achieved through the developed agro-industrial complex of the country, in particular, agriculture. This is especially topical for countries in Asia and Africa, where the highest levels of malnutrition and one of the lowest levels of food sustainability are observed.

However, recent events show that the level of development of agro-industry, despite the stable growth trend, may decline in Europe, where due to the introduced quarantine restrictions there is an additional need to import the final products of agro-industrial complex. The situation that has arisen this year proves that regardless of the level of development of the country, almost no one is ready to be influenced by large-scale negative factors, which is actually quarantine. That is why it is necessary to take preventive measures to ensure the stability of agriculture and the food industry in all regions of the world.

In particular, in order to stimulate the development of agro-industrial complex it is necessary to develop a clear sequence of actions. Such a sequence of actions is actually a strategy that is developed at the national, interstate, regional and local levels. At the same time, it is extremely important to apply a comprehensive and thorough approach to the development of operational programs and short-term plans, which are tools for achieving key goals for the development of agro-industrial complex. At the same time, it is important to implement strategies along with the active state policy to support the agricultural sector, which is expressed in tax incentives, the formation of an attractive investment climate, legal protection of

farmers, etc.

Conclusions

The research conducted within the framework of this academic paper makes it possible to draw conclusions that in the near future one of the key challenges facing humanity will be the issue of food security of the world's population. Such tendency will primarily be caused by the growth of the general population on the planet along with a significant decline in living standards, especially in developing countries. Furthermore, one should not rule out the negative impact on the available food supplies from such factors as financial and economic crises, deterioration of natural conditions, climate change, which affects the prevalence of crop failures, as well as the influence of extraordinary factors, such as the introduction of quarantine practically all over the world, which has resulted in the closure of borders, the impossibility of labor migration, cross-border trade, etc. and as a result, significantly shaken the level of food security of most countries, especially underdeveloped ones.

Consequently, significant efforts should be directed to strengthening the level of food security of the country, including through the development of the agro-industrial complex and agriculture as an integral part of it, which is successfully carried out by highly developed countries with high gross value added in agriculture, as well as a clear trend towards increasing food sustainability. The vast majority of these countries are located in European region. Indeed, the statistical data presented in the study show that there is an increase in gross value added of agro-industry in Europe, along with an increase in the index of product value and intermediate consumption expenditures, especially in 2017-2018. In addition, the size of the indicator Gross Fixed Capital Formation in agriculture indicates a steady increase in investment in agricultural development in almost all European countries. The situation is radically opposite in Asia and Africa, as well as Latin America and the Caribbean, where, despite high levels of malnutrition, low levels of food sustainability and low rates of agricultural development are observed. The problematic of these countries concerns not only the production of the required amount of food, but also the preservation of available agricultural resources, ensuring their constant reproduction and a high level of productivity, which will be the key to the formation of food security for more than one generation.

In addition, according to forecasts for the next few years, it is expected to reduce food sustainability and the pace of development of agriculture in the



European region, which will be reflected in the growth of imports of agricultural products to European countries. And only by 2022, with the removal of quarantine restrictions, the level of exports and imports in the European region will be able to equal the level of 2019.

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