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ASSESSMENT OF THE ROLE OF POTATOES IN ENSURING FOOD SECURITY AND THE IMPACT OF SEED POTATO IMPORTS ON SECTOR DEVELOPMENT

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Abstract

The article evaluates the role of potato farming in ensuring food security, identifies existing problems as well as positive situations achieved as a result of structural reforms in the system. Also, the methodological approach recommended by the researcher to assess the impact of import of potato seeds on the development of the sector, which is considered as one of the current issues in the system, was reflected.

Keywords: food security, potato production, consumption ration, import, import load, import growth rate, dependency coefficient, integral coefficient, region.



Introduction. It is known that the primary task of the economy in the society is the food security of the country, and in this process, the problem of providing the population with potato products from agricultural products is gaining strategic importance. Because the history of potato cultivation and the fact that this product occupies the main place in the diet of food consumption today requires the development of the potato growing system all over the world.

It has become a tradition to consume cereal and rice products as primary agricultural products as the main products that provide useful carbohydrates for the human body. In recent years, there has been a tendency to prioritize the consumption of potatoes in the diet. The main reason for this is, firstly, that growing potatoes technologically allows for high yields, and secondly, it has been proven that potatoes produce 1.5-2 times more carbohydrates per hectare than grain products. In this respect, the place of potato cultivation is high in meeting the supply of organic and mineral substances required for human physiological development. The high protein content of potato determines its high biological value. Also, this product is rich in vitamins C and V. According to experts' calculations, 200 grams of potatoes provide 5% of a person's daily energy requirement, and consumption of 600 grams satisfies the daily requirement of vitamin C, etc.

Potato tubers serve as a good raw material for the processing industry, they are important raw materials for the production of glucose, alcohol, rubber and other products, as well as in the food, paper and textile industries. More than 200 dishes are prepared from this product in European countries. Also, potatoes and their processing are widely used to provide high-strength feed products, which are also important for livestock. In terms of this characteristic, it occupies a leading position among agricultural products.

Therefore, a number of reforms aimed at ensuring the stability of the potato growing system were implemented in our republic. As a result of these reforms:

- the potato cultivation area in our republic increased by 2.6 times in 2022 compared to 1990. That is, in accordance with these years, the potato cultivation area was increased from 41.8 thousand hectares to 109.1 thousand hectares;

- as a result, it is possible to quantitatively increase the gross yield. For example, in 1990, an average of 336,400 tons of potatoes were grown in the republic, and in 2022, this figure increased by 10.2 times to 3,443,200 tons.

However, along with these positive results, a number of issues remain to be resolved. In particular, according to the

monographic studies, if natural and climatic conditions and seed production are considered as the main influencing factors for the development of the potato industry, we can observe that pests and diseases have a negative effect, and tasks related to researching their scientific basis and equipping the system with modern laboratories are being put on the agenda. Because the population and farms are forced to plant imported or low-quality local seeds due to the limited availability of elite and R1 seeds. Also, it can be seen that there are not enough fields and greenhouses for growing high-yielding seed potatoes, as well as warehouses for their storage. Non-availability of laboratories to test for viral and bacterial diseases leading to reduced productivity are considered as the main factors adversely affecting the development of the industry today.

The development of the potato industry, together with a number of factors mentioned above, has a high impact on the level of development of the seed system, which has a long-term effect not only on the production indicators of the current year, but also in the conditions where traditional seed production (saving seeds for planting next year) is practiced in our country. remains. This is clearly shown by the fluctuations in the development of potatoes in our country after 2016. In other words, under the influence of various factors, local potato seed production is manifested in the form of a decrease in "immunity" to diseases and pests, a sharp decrease in productivity and, as a result, an unsatisfied gap in the market, and an increase in the demand for imported seeds. In turn, as a result of the scientific research of our country's scientists, new potato varieties have been created and are being regionalized.

In particular, a total of 150 potato varieties are included in the state register of agricultural crops recommended for planting in the territory of the Republic of Uzbekistan. Of these, 20 varieties were created by scientists of local research institutes [1]. However, this potential leads to an increase in the demand for imported seeds without allowing us to fully satisfy the existing domestic demand in our republic. It should be noted separately that in a number of studies on the concept of food security and its evaluation, it was proposed to define it by the "food dependence coefficient" [2]. It is noted that this coefficient is directly related to the level of dependence of the volume/value of imports. Taking into account the high position of potato products in food consumption, and reducing the level of dependence on imports of this product and potato seeds, it is considered one of the important issues in ensuring food security of the country's agrarian sector. Because the import of seeds of agricultural crops has a direct impact on

the development of the sector.

In the world experience, the number of studies on the assessment of this effect is increasing, and various methods and tools are widely used in them. In world science, two different approaches are being formed to assess the impact of agricultural seed imports on the development of the sector, and they are distinguished by their direct dependence on organizational solutions in relation to the dependence of the seed production system on external factors. In particular, the researches of the first group of scientists are scientists working in the European Union, and because of the adoption of uniform regional requirements for the seed production system, they have little influence on national interests, are formed based on the conditions of control and non-observability of deviations from prospective plans, and mainly imported seeds are used in a certain area of agriculture. as a factor that does not have a very large influence on the network, is giving impetus to the formation of views. Therefore, it can be observed that the researchers of this group focus on assessing the overall impact of agricultural seed imports using basic mathematical models and analytical programs. [3]. At the same time, there is a second group of scientists and researchers who believe that large shifts can be observed in the development of a certain sector depending on the level of development of the seed production system and the state of the volume of imports. We can see that the scientists of this group are especially engaged in the foreign market in the countries where the economic relations are not constant, rapidly changing and very influential on the political order, in particular, in the CIS and East Asian countries. In this group, index methods are widely used to assess the general impact level of import of agricultural crop seeds [4].

Based on this, the scientific justification of the methods, intervals and criteria of integrated assessment of the impact of import of potato seeds on the development of the sector becomes relevant. There are many factors and indicators in the integral assessment of the impact of import of potato seeds on the development of the industry.

Through the indicators that met these requirements, 4 indicators were selected in our research. The method of calculation of the selected indicators and their contents were systematized as follows (Table 1).

Table 1.

An integrated assessment of the impact of potato seed imports on the development of the sector.

Indicators	Content	Method of Calculation	Here:
Import load factor	Import saturation of the sector represents the share of seed that is imported.	$Iyk = Iu/Ykm$	Iyk is the coefficient of import load Iu – volume of imported potato seeds, tons Ykm - the total volume of cultivated potato seeds, tons
Import growth rate coefficient	Represents the growth rate of potato seed imports.	$Iok = Iki/Ikj$	Iok – Import growth rate Iki – Average annual imported seed in the last 3 years, tons Ikj – seed imported in the base year, tons
Priority coefficient of seed price	Represents the difference between the price of imported potato seed and the price of local seed.	$Ubk = Mub/Iub$	Ubk – seed price priority coefficient Iub – Price of imported potato seeds Mub – Local seed price
Import seed dependence coefficient	Represents the dependence caused by the inability to provide or unsatisfactory quality of local seed.	$Iqk = Muu/Iuu$	Iqk – Import seed dependence coefficient Muu - the total amount of local seeds sown, tons Iuu - the total amount of imported seeds sown, tons
Integral coefficient of impact of import of potato seeds on the development of the sector	It represents the pressure on the sector, as a result of changes in potato seed imports	$IBk = Iyk + Iok + Ubk + Iqk$	IBk – coefficient of impact of import of potato seeds on the development of the sector

For this purpose, the following requirements have been formulated. Including:

- availability of statistical numbers when studying the possibility of the selected indicators reaching real numbers;
- the possibility of determining the standard ranges of selected indicators from various scientific literature;
- that the selected indicators can be considered as a “pain point” in the agrarian economy of our country.

According to this methodological approach, the import load coefficient (Iyk) can be determined by the ratio of the volume of imported potato seeds (Iu) to the total volume of potato seeds grown (Ykm), representing the import saturation of the sector, the share of imported seeds. The import growth rate coefficient (Iok) represents the growth level of potato seed import and is determined by the ratio of the average annual volume of imported seed (Iki) in the last 3 years to the volume of imported seed (Ikj) in the base year.

The priority coefficient of seed price (Ubk) is the ratio of the price of imported potato seeds (Iub) to the local seed price (Mub), and the coefficient of import seed dependence (Iqk) is the total amount of domestic seed planted (Muu) divided by the total amount of imported seed planted (Iuu).

In turn, the sum of the above indicators makes it possible to calculate the integral coefficient of the impact of import of potato seeds on the development of the sector.

Based on the selected methodological approach, the possibility of determining the standard ranges of the indicators selected on the basis of research from various scientific literature was studied (Table 2).

According to the researches, if the amount of imported seeds in seed production is around 10 percent, it is considered as a standard level [5], and if the growth rate of seed import corresponds to the growth of the production area, it is considered as a standard level [6]. Also, it is normal for the price of imported seeds to be 30% higher than the price of local seeds, and more than that requires the reform of local seed production [7]. Scientific sources consider import seed demand up to 37 percent as the norm when there is a local seed production system, but there is little demand for it.

Based on the above, we believe that the arithmetic mean of the minimum indicators of all selected coefficients can be considered as the minimum amount of this indicator.

Table 2.

Intermediate indicators of the coefficients representing the impact of potato seed imports on the development of the sector.

Indicators	Standard intervals	The essence
Import load coefficient (Iyk)	$0,83 < Iyk < 1$	In seed production, the amount of imported seeds is considered to be around 10 percent
Import growth rate coefficient (Iok)	$0,97 < Iok < 1$	The growth rate of seed imports is considered to be normal if it corresponds to the growth of the area under cultivation. It can be considered as 97% in the conditions that the potato cultivation area in our country is increasing by 3% per year.
Priority coefficient of seed price (Ubk)	$0,7 < Iok < 1$	Imported seed prices are usually up to 30 percent higher than local seed prices, and more than that would require reform of local seed production.
Import seed dependence coefficient (Iqk)	$0,63 < Iqk < 1$	If there is a local seed production system, but there is little demand for it, the demand for imported seed is considered to be up to 37 percent as the norm.
Integral coefficient of impact of import of potato seeds on the development of the sector (IBk)	$0,78 < IBk < 1$	The arithmetic average of the minimum indicators of all selected coefficients is considered as the minimum amount of this indicator

Based on this situation, it is recommended to determine the indicator (0.78) as the minimum level of influence on the development of the sector, and it can be evaluated as a good or normal situation. On the other hand, based on the analysis of scientific literature and

various calculation methods, we believe that it is logically and methodologically correct to determine the evaluation indicators as satisfactory in conditions that are less than 30 percent of the normal level, and bad in conditions that are less than that (Table 3).

Table 3.

Evaluation of the impact of import of seed potatoes on the development of the sector through coefficients.

Criteria	Intervals	The essence
Normal	0,78< IBk<1	The potato seeding system is not at risk during this interval
Satisfactory	0,55< IBk <0,77	In this interval, the potato seeding system has initial signals and it is possible to adjust it again
Not satisfactory	0< IBk <0,55	In this period, the potato seed production system is considered to be in danger and in need of necessary measures in the medium and long term

However, taking into account factors such as the geographical location and the level of resource provision of the regions of our country, the uneven supply, and the farming culture formed in these regions, in turn, taking into account factors such as food security, it is necessary to classify them on the basis of 3 criteria based on their socio-ecological potential, and according to it It will also be possible to classify the coefficients of the influence of the proposed import of seed potatoes on the development of the sector.

In particular, according to experts in the field, the regions are divided into different regions in terms of the development of potato growing in our country, especially in terms of its potential for the development of elite and first-generation seed production. In this, a number of factors are taken into account, such as the natural and climatic conditions of this area, the composition of the soil, the width and intensity of the spread of diseases and pests, as well as the location in relation to infrastructures, as well as the formation of demand and supply.

Based on this, in our opinion, the evaluation coefficients of the conclusions and proposals developed on the basis of research can be classified in the cross-section of regions. In particular, the Fergana Valley and Tashkent regions, which have high potential due to the climate and soil composition of our country, can be included in the first (base) region, and the dependence of import on seeds in this region is negatively evaluated, and the integral coefficient of the impact of the proposed average import of potato seeds on the development of the sector is it is proposed to increase the minimum limits by 10 percent (Table 4).

Also, Jizzakh, Samarkand, Surkhandarya and Kashkadarya regions can be included as the second (normal) region, the natural and climatic conditions for growing potatoes and developing their seed production in this region are average, and the impact of importation of seeds in this region is estimated to be moderate.

Table 4.

Stratification of the influence of potato seed imports on the development of the sector in the regions of our country.

Criteria	Intervals	The essence
The first (base) region	0,88< IBk<1	This region has favorable natural climatic conditions for growing potatoes and developing its seed production, and dependence on imported seeds in this area is negatively evaluated.
(Fergana Valley and Tashkent regions)	0,78< IBk<1	Natural-climatic conditions for potato cultivation and seed production in this region are average, and the impact of importation on seed in this region is estimated to be moderate.
The third (intermediate) region (KKR, Navoi, Khorezm, Syrdarya)	0,65< IBk<1	In this region, there are unfavorable natural climatic conditions for the cultivation of potatoes and the development of its seeds, and the cultivation of the product is considered even at the expense of imported seeds.

On the other hand, regions such as the Republic of Karakalpakstan, Navoi, Khorezm, Syrdarya, where there are unfavorable natural climatic conditions for the cultivation of potatoes and the development of their seeds, and where the cultivation of products should be considered even at the expense of imported seeds, can be proposed as the third (intermediate) region.

In conclusion, the influencing factors in the field of potato seed production today are various, and their systematization allows to correctly identify the root causes of the problem and to develop and improve the scientific basis for its elimination. Also, on the basis of this methodological approach, it can be used as a scientific basis for the development of regional and practical measures for the sustainable development of potato growing, based on the existing opportunities of the regions, potentials for the development of the sector, reserves.

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