

ECONOMETRIC ASSESSMENT OF THE IMPACT OF CLIMATE CHANGE ON AZERBAIJAN'S FOOD SECURITY

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Introduction

Agriculture is a strategic sector that has an important role in the social and economic development of the country. This sector is linked to a variety of objectives, from ensuring population food security to stimulating economic growth and achieving sustainable development goals.

The increase in agricultural production creates a number of important benefits and opportunities in the country's economy. First, agriculture ensures food security and healthy and diverse nutrition of the population. People's health and therefore good healthcare standards are the basis of the country's social and economic stability.



From this point of view, the added value of agriculture is considered the main indicator for increasing health and well-being in the country.

Second, agricultural added value creates dynamics that lead to economic growth and development. The agricultural sector is directly or indirectly related to many other sectors along with activities such as production, technology, labor, and investment. Together with increased production, job creation, and the application of innovative technologies, agriculture stimulates economic growth and contributes to the increase of national income through the increase of Gross Domestic Product (GDP).

Third, we must consider the impact of agriculture on international trade. Agriculture is based on the historical, geopolitical, and territorial importance of the country. Countries can meet local demand by developing agriculture, and at the same time, by developing international trade relations with various countries, which helps to increase the foreign currency income of the state. This contributes to the deepening of the country's economy and a positive trade balance along with the export of products.

One of the most important goals of the state of Azerbaijan is to ensure the growing population of the country with quality and healthy food products and, as a result, to prevent potential food shortages nationwide. Therefore, one of the most priority goals of the agrarian economic policy in the country is to increase food production in the country through agriculture and to provide the growing population with food products of the necessary quantity and quality.

There is a high potential for the development of agriculture in the Republic of Azerbaijan. Thus, 47% of the country's population (4.6 million people) live in rural areas, and the number of people engaged in food production in this country is quite large. In 2016, 36.4 percent of the country's population was engaged in various agricultural fields.

On the other hand, the availability of sufficient arable land for food production enables the country to meet its domestic food demand. So, 4769.7 km² of land in the country is currently suitable for cultivation. However, one of the most important problems in the country is the reduction of usable land per capita. In the Republic of Azerbaijan in 2000, the arable land area per capita was 0.58 hectares, but during the next 15 years, due to the growing population, the arable land area per capita decreased seriously and became 0.49 hectares.

In 2014, 1612.7 thousand hectares of land were used for food production. 1000.5 thousand hectares of that land area was used for growing cereals and legumes. In that year, 167.7 thousand hectares of arable land was used for the cultivation of vegetables and melons. In addition, in 2014, 43.7 thousand hectares of arable land were used for growing technical crops. In 2014, special attention was paid to the expansion of the cultivation areas of cotton, sunflower, tobacco, and other technical plants.

The climate diversity in Azerbaijan allows the cultivation of different food products in this country. Thus, in Lankaran, the southern region of Azerbaijan, various citrus fruits, grapes, grains, and food products such as tea are produced with high quality. Walnuts, hazelnuts, tobacco, and fodder grains are grown in the northern regions of Azerbaijan, Sheki, and Zagatala. Ganja for growing cotton and fruit, and Gadabay for growing potatoes and honey provide farmers with fertile conditions. The areas around Absheron and Baku provide the local market's need for vegetables. In addition, the territory of Guba and Khachmaz provides farmers with suitable and fertile land and water resources for fruit production.

Only in the field of horticulture, we are witnessing an increase in arable land areas. Thus, in 2012, a total of 1,647.1 thousand hectares of arable land was allocated for plant production, and in 2017, this indicator increased to 1,665.7 thousand hectares. The increase in cultivated areas directly affects the level of production. The main reason for this increase is the increase in attention and interest in technical plants. Thus, compared to 2012, the land area allocated for the production of technical plants increased more than 3 times in 2017. However, there is a significant decrease in the amount of cultivated land devoted to the production of other crops. This has a negative impact on the production of cereals and legumes, potatoes, vegetables and melons and fodder crops in the country. The allocation of arable land to technical plants leads to the lack of land of the necessary quality and volume for the production of such plants and, as a result, to the minority of such plants in the domestic market.

In terms of ensuring food security in the Republic of Azerbaijan, grain growing is of great importance. As a result of the state support and policy allocated to agriculture, the volume of grain produced in the country increased by 36.2 percent between 2003 and 2012.

Thus, the severe climate change that started in the fall of 2013 resulted in a drought in the country until the spring of 2014. During that period, as a result of the scarcity of irrigation water, the growth process of the plants did not pass normally and the productivity was seriously below expectations. About 55.7 thousand hectares of land became unfit for cultivation due to dry climatic conditions.

A total of 2179.3 thousand tons of grain was harvested from 963.4 thousand hectares of cultivated land in 2014 during the drought (Abasov, I.D, 2013: p. 8). The mass of wheat produced in that year was 1446.5 thousand tons, the mass of corn was 200.1 thousand tons, the mass of potatoes was 819.3 thousand tons, the total mass of vegetable plants was 1181.6 thousand tons, and the mass of sunflower was 20.3 thousand tons and the mass of cotton was 40.6 thousand tons (Mirzaliyeva, 2015:p.44).

The production of legumes and cereals has developed significantly in the country. Thus, in 2011, the total mass of cereal legumes and cereal crops was 2955.3 thousand tons, and this indicator increased to 3065.1 thousand tons in 2016.

As a result of the research carried out by FAO in Azerbaijan, it was determined that this country has a serious competitive advantage in the production of fruits and vegetables. Especially fruits such as oranges and apples and vegetables such as tomatoes and cabbage are produced with high quality in the climatic conditions of Azerbaijan. Although climate change in 2014 had a negative impact on the fruit production process, the level of fruit production in the country was high during this period.

The development of agriculture is of great importance to ensure food security within the country and effectively meet the local population's need for food. In order to realize food security in any country, it is necessary to create a sustainable and developing agriculture. In this sense, an effective food security strategy is closely related to providing the necessary food products to the population of the country through the local resource potential. The increase in the production of food products in recent years in Azerbaijan is an indicator of the increase in the potential of the country to provide itself with food. However, despite the development in grain production in recent years, the obtained indicators are not at a high enough level in terms of food security. The main reason for this is that a part of the country's demand for grain products is still met through imports. The same situation is observed in the field of animal husbandry. So, despite the serious development in this field, part of the country's demand for meat and meat products is met by exports from foreign countries.

Development in the field of agriculture in Azerbaijan has a positive effect on ensuring food security. However, the main issue at this point is not related to the increase in the total production level. The main issue here is the increase in food production per capita.

If the growth in food production is lower than the growth rate of the country's population, in such a situation, a serious problem related to the provision of food security in the country may emerge. The main issue here is that if the population grows at a high rate and the growth in the level of production is lower than the population growth, the demand for food will increase, and as a result, there will be no development in terms of food security.

When the share of production per capita in Azerbaijan is taken into account, it becomes clear that the development in the field of agriculture does not seriously affect the provision of food security in the country and that there is a need for further development in this field.

The increase in agricultural production observed in recent years is developing the ability of the country to provide itself with food, and as a result, it provides an opportunity to realize food security through domestic production. Thus, providing the population with food at the expense of the domestic market enables the country to implement measures related to food safety in a more effective and efficient manner and to prevent low-quality and health-risk products from entering the country in the foreign market.

In general, providing the population with more reliable food in our Republic is one of the most priority goals of the country's economic policy. So, providing domestic food demand with high-quality and healthy food products is the most important factor.

The food supply of the country's population is carried out in two directions:

- *Self-sufficiency through local production,*
- *Self-sufficiency through import channels.*

Thus, if the local production level can provide the population with sufficient and quality food products, the risks related to food security are seriously reduced. The reason for this is that there is a high risk of food safety in food products imported from abroad and there is a strict state control of the domestic production process, so ensuring food safety is carried out more effectively and efficiently.

As a result of the development in the level of food production achieved in the Republic of Azerbaijan in recent years, it creates conditions for ensuring food security in this country. Thus, the increase in production in grain products, animal husbandry, fruit production, and other agricultural fields creates conditions for supplying the growing population of the country with sufficient and better quality food products.

In modern times, the regulation of food safety is one of the most strategic and important mechanisms for providing the population with higher quality and sufficient food in the country. For this reason, it is important to take effective and efficient measures by that state to regulate food safety within the state. A number of measures have been taken to regulate food safety in the Republic of Azerbaijan. Thus, in order to improve the food safety mechanism in the country, the state has implemented the modernization of the food complex.

Modernization of the food complex is of great importance in improving sustainable food supply in the country. Thus, one of the most basic requirements of the transition to sustainable food supply in the modern era is the creation of effective and efficient mechanisms for the protection of food products produced in the country. Therefore, it is of great importance to make the mechanism of protection of food products more effective and efficient on the basis of new technologies.

Thus, the food complex has a great influence in protecting the food products produced in the country and providing the population with quality food products, therefore, improving the existing food complex in the country based on modern technologies and increasing its food potential is one of the most important aspects of improving the food security mechanism.

The basis of the modernization and development of the food complex in the Republic of Azerbaijan is the creation of a sustainable development model for the production and export of agricultural products in the country. Therefore, one of the main goals of the state programs for the development of regions in the Republic of Azerbaijan is the creation of sustainable food complexes that meet modern requirements in the regions. For this purpose, a number of measures have been implemented by the state in order to ensure the modernization of the food complex in different regions of Azerbaijan. Thus, in order to increase the quality and volume of agricultural products, special measures have been implemented by the state for the application of new technologies in these areas.

One of the most serious state measures aimed at improving the mechanism of ensuring food safety in the Republic of Azerbaijan was the establishment of the Food Safety Agency of the Republic of Azerbaijan. Before the establishment of this agency, the state mechanism created to ensure food safety differed significantly from the requirements and mechanisms at the international level. Thus, in the Republic of Azerbaijan, two main state institutions were operating with the aim of ensuring food safety in the domestic market. On the one hand, the State Committee for Standardization, Metrology, and Patents was the state institution that determined the compliance of the food production process within the country with the standards set

by the state (Musayev, 2017:p.3). Until the creation of the Food Safety Agency, this institution carried out the certification of the production process and compliance with the standards. On the other hand, the conformity of the food products available in the domestic market with the standards established by the state was determined by the Ministry of Economy. Since the creation of the Food Safety Agency, many functions belonging to these agencies have come under the control of agencies. Here, the main goal was to provide control of the general food processing process and market within the country by a single institution and, as a result, to implement the food safety mechanism in a more effective and efficient manner.

Many studies have been conducted on the added value of agricultural products and the factors influencing this added value. Production functions and econometric studies are the majority of these studies. Among the production functions, the Cobb-Douglas production function, which is the most widely used, examines the effect of capital and labor on added value, which are the two main factors affecting agricultural production. In Azerbaijan, the analysis of agricultural added value by production functions was found for the first time in the research of Professor Yadulla Hasanli. Thus, the Cobb-Douglas production function was established based on the statistical data on capital and labor from 1995-2015, and the effect of both factors on added value was studied (Hasanli, 2017).

Professor Hamza Khalilov conducted research on the analysis of growth rates of agricultural production in Azerbaijan (Khalilov, 2020). Elchin Nasirov analyzed the impact of climate change on agriculture (Nasirov, 2021). Rafail Rzayev and Gunay Rahimli conducted research on finding the optimality of the capital-labor ratio in the agricultural sector using the CES production function (Rzayev, Rahimli, 2022).

In Azerbaijan, there are very few research studies on the empirical evaluation of factors affecting agricultural added value. If we look at the research work on the assessment of factors affecting agriculture in the world today, we can see that more and more climate factors are included in the research. The table below shows some of these studies.

Table 1. Research works related to the evaluation of factors affecting agricultural-added value

| Author | Period, Country | Variables | The result |
|-----------------------------------|---|--|---|
| Aggarwal et al (2010) | 11 districts Upper Ganga Basin, India | Dependent variable: growth and yield of rice and wheat plants. Independent variable: Solar radiation, temperature, precipitation, wind speed and vapor pressure | In the simulation analysis using Info Crop Wheat and Info Crop-Rice models, it was found that rice and wheat crops will be affected by climate change. |
| Bayrac and Dogan (2016) | Turkiye | Dependent variable: agricultural GDP. Independent variable: CO2 emissions, agricultural productivity, temperature, precipitation. | The study finds that changes in agricultural productivity and precipitation have a positive effect on agricultural GDP, while CO2 emissions and temperature changes have a negative effect. Moreover, the negative impact of temperature changes on the agricultural sector is greater than the positive impact of precipitation changes. Therefore, the overall impact of climate change on the agricultural sector is negative. |
| Abas Ali Candio and others (2020) | Denmark | Dependent variable: winter wheat production. Independent variable: carbon dioxide emission (CO2), temperature, precipitation, evaporation. | The study used a crop simulation model, assuming that water does not limit growth. High temperatures reduce the period of maturity of certain species. A 1°C increase in temperature during grain filling of wheat is estimated to reduce the length of this phase by 5%. |

Research information base

The variables used in the study were taken from the State Statistics Committee, the relevant information base of the FAO and the World Bank.

A description of the variables and their sources is given in Table 2.

Table 2. Description of variables

| N | Variables | Description | Source | Definition and size of variables |
|----|-----------|------------------------------|-------------------------|--|
| 1. | Y | Real added value | FAO (FAOSTAT) | In this study, the agricultural added value calculated for 2015 is used as the base year. |
| 2. | X_1 | Employed population | Committee of statistics | Engaged in agriculture population, in millions |
| 3. | X_2 | Trade Openness Index | FAO (FAOSTAT) | It is defined as the ratio of the sum of the import and export of agricultural products to the agricultural added value. |
| 4. | X_3 | Fertilizer | World Bank | Fertilizer given per hectare as a unit of measure expressed in kilograms is accepted |
| 5. | X_4 | Average annual precipitation | World Bank | mm |
| 6. | X_5 | Average annual temperature | World Bank | degrees Celsius |

Methodology

The main objective of the study covering the years 1995-2020 is to evaluate the impact of the Trade Openness Index, average annual precipitation, average annual temperature and the amount of fertilizer applied per hectare on the value added in agriculture.

Justification of variables

Logarithmic values of variables were used to study the impact of economic and climatic factors on added value in agriculture. Using logarithmic values reduces the variation between the values of the variables, the distribution is closer to the normal distribution, and it facilitates the interpretation and comparison of the coefficients obtained from the model. In the model, the added value of agriculture in real terms was used as a dependent variable. In the model, the added value $\ln VA$ represents the Trade Openness Index, which corresponds to the ratio of TOI (+) agricultural trade (imports+exports) to agricultural GDP, denoted by the amount of fertilizer F . This is a standard index whose impact on growth is often positive in the literature (Fhosu and Maghnus, 2006). $Prec$ (precipitation) (+/-) represents the annual precipitation used to show the effect of climate, and T represents the annual temperature. In the model, L (+) indicates the number of people working in agriculture. As primary production factors, capital and labor are factors that play an important role in the development of agriculture and are considered the main variables of production functions (Lopez, 2007).

Model estimation method

Unit root analysis is the first step in time series analysis. It provides information about the degree of integration of each variable. The stationarity test is performed by testing for unit roots. Non-stationary data will result in an inaccurate regression.

Note that if the variables are integrated at the level of $I(0)$ and $I(1)$, it is convenient to use the ARDL (Autoregressive Distributed Lag) model for research. In the case of second and higher stationarity, the ARDL model cannot be used. Since all the variables included in our study have stationarity at the $I(0)$ and $I(1)$ level, we use the ARDL model for the purpose of econometric evaluation of the factors affecting added value. The general form of the ARDL (p, q) model is as follows:

$$y_t = \delta_0 + \sum_{i=1}^p \delta_i y_{t-i} + \sum_{i=0}^q \beta_i x_{t-i} + \varepsilon_{it} \quad (1)$$

here:

y_t - dependent variable; x_t - values of the free variable; β_i - free variables and coefficients of their past values; $\delta_1, \delta_2, \dots, \delta_p$ - coefficients of the past values of the dependent variable, ε_{it} - represent the residuals (error term).

Determining the optimal number of lags

There are various criteria in the literature to find the optimal lag length that determines the best model. In this study, the AIK - Akaike Information Criterion was used to determine the optimal delay length. AIK is used for model selection and comparison. It works as an evaluation function to choose between different statistical models, it helps to evaluate and compare whether the model is good or not.

Table 3. Selection of optimal lags based on AIK

| Variables | Optimal lag |
|-----------|-------------|
| LNVA | 2 |
| InF | 2 |
| InTOI | 1 |
| InT | 1 |
| InPrec | 1 |
| InL | 4 |

Source: *The table was compiled by the author based on the calculations made in the "Stata 15" software package.*

The significance of the variables is determined according to the value of the t statistic and the p probability value, the coefficient found when the p-value is less than 0.05 is considered significant, but in some literature, the coefficients are also considered significant for values of p-value less than 0.1 (Hacem and Dogan, 2018)

Checking the adequacy of the model

For the ARDL model to be adequate, the residuals of the model should be homoscedastic, should not have a serial correlation problem, and should be stable and normally distributed. The results of the tests for the residuals of the model are given in Table 4. White's test tests the presence of heteroscedasticity among the residuals of the model. A probability value greater than 0.05 as a result of the test indicates that there is no problem of heteroscedasticity between the residuals.

That is, the residuals of the model have constant variance.

This is one of the important conditions for adequacy. Similarly, we can say that the residuals of the model are normally distributed according to the probability value p . Because the lags of the dependent variable in the ARDL model are included as explanatory variables, the problem of serial correlation of residuals cannot be investigated with the "Durbin-Watson" test, in this case, the "Breush-Godfrey Serial Correlation LM" test is used for the problem of serial correlation of residuals.

The result of the "Breush-Godfrey Serial Correlation LM" test is shown in Table 4, which shows that the residuals do not have a serial correlation problem.

Table 4. Diagnostic test results

| Test | χ^2 | Probability |
|---|----------|-------------|
| White test (Белый тест) | 23 | 0. |
| Jarque-Bera test for normality (Тест Жарк-Бера на нормальность) | 1. | 50 |
| Breusch-Godfrey test for serial correlation LM (Тест Бреуша-Годфри на серийную корреляцию LM) | 3 | 18 |
| | 6 | 0. |
| | 2. | 50 |
| | 2 | 65 |
| | 3 | 0. |
| | 4 | 13 |
| | | 05 |

Source: *The table was compiled by the author based on the calculations made in the "Stata 15" software package.*

One of the adequacy indicators of the ARDL model is the stability of the model. This means that the parameters of the model should remain stable across periods. "Cusum" test is used for model stability. The result of the "Cusum" test is given in Appendix 2. The result of this test shows that there is no structural break in the residuals, in other words, the stability condition of the model is satisfied. The conducted tests show that the ARDL model results are adequate.

Conclusion

The analyses carried out make it possible to draw a number of conclusions related to food security in the country and give certain recommendations. Thus, one of the main problems in ensuring food safety in the territory of the Republic of Azerbaijan is related to the lack of a unified information system. Thus, the lack of concentration of information related to the country's food production and demand in a single system hinders the clarification of the problems related to this field in the Republic of Azerbaijan. In addition, development in the field of agriculture plays an important role in ensuring food security in the country. Thus, providing the population with quality and sufficient quantity of agricultural products has a positive effect on food security. There are fertile conditions for the development of the agricultural sector in the Republic of Azerbaijan because there are soil and climatic conditions necessary for agriculture. In recent years, the production growth in Azerbaijan in the fields of agriculture, plant breeding, animal husbandry, and fruit and vegetable growing enables the country to play an important role in ensuring food security in both the domestic and foreign markets in the future. Azerbaijan has an important role in ensuring food security in its state because as a result of the implemented effective state programs, a sufficient amount of high-quality products have been produced in the domestic market.

Evaluation with the ARDL model shows that the amount of fertilizer provided per hectare and the number of employed people working in the agricultural sector have a positive effect on agricultural added value. In the considered period, a 1% increase in the amount of fertilizer applied to each hectare of land leads to an increase in agricultural added value by 0.04%, and a 1% increase in the employed population with a delay of one year leads to an increase in added value by 0.36%. It appears from the model that the effect of temperature on value added is negative. A 1% increase in temperature causes a 0.36% decrease in added value. However, other explanatory variables of the model, the Trade Openness Index and the evaluation of the parameters of the effect of average annual precipitation on added value, were not statistically significant. Since there is no cointegration relationship between the explanatory variables and the dependent variable in the long-term period, the ARDL model is constructed for the short-term period.

Despite the positive growth in the provision of food security in the Republic of Azerbaijan, there are still some directions for development. These are the following:

- *Creation of a single information portal related to food safety and integration of all information related to this field in one system is one of the most important directions of development. Thus, the lack of a unified information system hinders the*

clarification of the current situation and problems related to food safety. For this reason, the creation of such a portal will facilitate the acquisition and analysis of information related to food safety in a shorter period of time.

- The creation of large-scale farms by combining small plots of land is another direction of development. Thus, it is very limited to attract investment and apply modern technologies to small farms, which limits the total production volume of the country. However, the integration of small plots of land into large farms will seriously affect the country's agricultural production. For this reason, it is necessary to speed up the integration of farmers with small plots of land into large farms.*

- Connecting agriculture more with industry is another direction of development to ensure the country's food security. Thus, the use of certain products produced in agriculture as raw materials in industry creates a specific condition for the development of these two economic fields. On the other hand, the development of various industrial products in the agricultural production process creates conditions for the mutual development of these two economic sectors. For this reason, agriculture and industry in the Republic of Azerbaijan should be further coordinated, because the cooperation of these economic sectors has a positive effect on food production and supply in the country.*

- Increasing the number of agro parks and providing them with renewable energy is one of the directions of food security development in the country. Currently, the production and capacity potential of agricultural parks operating in the country is lower than the production and capacity potential of agricultural parks operating in other countries. Increasing the size and area of existing agricultural parks will have a positive effect on the food supply of the country's population. In addition, supplying greenhouses with renewable energy will prevent agroparks from having a negative impact on nature, as currently operating greenhouses run on fossil fuels, which have a negative impact on nature. Therefore, providing agroparks with renewable energy will prevent the negative impact of agricultural production on the environment.*

Disclosure statement

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ÖZET

Azerbaycan'da iklim değişikliğinin gıda güvenliği üzerindeki etkisinin ekonometrik değerlendirmesi

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Gıda güvenliği ülkenin ulusal ve ekonomik güvenliğinin ayrılmaz bir parçasıdır. Yiyecek sağlamak, devlet için nüfusun önemli bir endişesi haline geldi ve önemli nitelikteki ekonomik ve sosyal sorunlardan biri haline geldi. Dolayısıyla sorunun çözümü daha geniş bir yelpazede sosyal, ekonomik, ulusal, demografik ve çevresel faktörleri kapsamaktadır. Şu anda ülke cumhurbaşkanının odaklandığı en önemli sorunlardan biri gıda güvenliğinin sağlanmasıdır. Azerbaycan Cumhuriyeti'nde nüfusa gerekli gıda maddelerinin sağlanması devletin ekonomi politikasının doğrudan yönlerinden biridir. Gıda güvenliğinin sağlanması iç kaynakların harekete geçirilmesine dayanmaktadır. Bu yaklaşım, ulusal ekonomik reformların geliştirilmesi, sürdürülebilir kalıcı kalkınma, yasal normların etkin kullanımı ve nüfusun yaşam refahının artırılması ile ilgili birçok değişikliğe dayanmaktadır.

Azerbaycan'da iklim değişikliğinin gıda güvenliği üzerindeki etkisinin ekonometrik değerlendirmesi, iklim değişkenleri ile gıda güvenliği göstergeleri arasındaki ilişkinin istatistiksel ve ekonometrik yöntemler kullanılarak analiz edilmesini içermektedir. Amaç sıcaklık, yağış ve aşırı hava olayları gibi iklim değişikliklerinin Azerbaycan'da gıda üretimini, gıda bulunabilirliğini ve erişimini nasıl etkilediğini anlamaktır.

İklim değişikliğinin gıda güvenliği üzerindeki etkisine ilişkin ekonometrik bir değerlendirme yapmanın iklim bilimcileri, tarım uzmanları ve diğer uzmanlarla işbirliği gerektirebilecek karmaşık ve disiplinler arası bir görev olduğunu belirtmek önemlidir. Ayrıca yüksek kaliteli, güncel verilere erişim, doğru analiz için kritik öneme sahiptir.

Anahtar kelimeler: Gıda güvenliği, iklim değişikliği, güvenlik ,analiz, ekonometrik

РЕЗЮМЕ

Эконометрическая оценка воздействия изменения климата на продовольственную безопасность Азербайджана

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Продовольственная безопасность является неотъемлемой частью национальной и экономической безопасности страны. Обеспечение продуктами питания стало важной заботой населения для государства и является одной из экономических и социальных проблем важного характера. Таким образом, решение проблемы охватывает более широкий спектр социальных, экономических, национальных, демографических и экологических факторов. В настоящее время одной из важнейших проблем, на которых акцентирует внимание президент страны, является обеспечение продовольственной безопасности. Обеспечение населения необходимыми продуктами питания в Азербайджанской Республике является одним из прямых направлений экономической политики государства. Обеспечение продовольственной безопасности основано на мобилизации внутренних ресурсов. Этот подход основан на многих изменениях, связанных с развитием национальных экономических реформ, устойчивым перманентным развитием, эффективным использованием правовых норм, повышением жизненного благосостояния населения.

Эконометрическая оценка влияния изменения климата на продовольственную безопасность в Азербайджане предполагает анализ взаимосвязи между климатическими переменными и показателями продовольственной безопасности с помощью статистических и эконометрических методов. Цель состоит в том, чтобы понять, как изменения климата, такие как температура, осадки и экстремальные погодные явления, влияют на производство продуктов питания, наличие продуктов питания и доступ к ним в Азербайджане.

Важно отметить, что проведение эконометрической оценки влияния изменения климата на продовольственную безопасность является сложной и междисциплинарной задачей, которая может потребовать сотрудничества с учеными-климатологами, агрономами и другими экспертами. Кроме того, доступ к высококачественным и актуальным данным имеет решающее значение для точного анализа.

Ключевые слова: Продовольственная безопасность, изменение климата, обеспечение безопасности, анализ, эконометрический