THE NEGATIVE CONSEQUENCES OF CLIMATE CHANGE AND THEIR COPING MECHANISMS

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Հոդվածը ստացվել է՝ 15.09.23, ուղարկվել է գրախոսման՝ 02.11.23, երաշխավորվել է տպագրության՝ 07.12.23

Introduction. Throughout the existence of the Earth, climate change has always existed. However, during the last two or three centuries, along with the drastic development of industry, those climate changes have become more significant. They have a negative impact on the quality of life and health of the population, therefore adaptation to climate change and implementation of measures to combat the changes as much as possible becomes a priority.

Climate change leads to serious food security problems and in order to avoid it, there is a need to develop appropriate strategies. As a result of climate change, the increase in temperature in recent years forces a new agrarian policy to be developed in order to face the created challenges. The investments made in the latest technologies will contribute to the stable development of the agriculture sector in the conditions of climate change. Throughout the existence of the Earth, climate change has always existed. However, during the last two or three centuries, along with the development of industry, these changes are more significant. They have a negative impact on the quality of life and health of a person, therefore adaptation to climate change and implementation of measures to combat change as much as possible becomes a primary issue.

The relevance of the article is conditioned by the scope and importance of the issue. The main goal of the article is to study the impact of climate change in the agriculture sector in RA and to propose coping mechanisms. To achieve that goal, the following tasks were set within the framework of the research:

- Climate change in the world, particularly in RA, and its impact on the economy were studied.
- Factors contributing to the emergence of adverse consequences of climate change were analyzed.
- Proposals were developed by combining the obtained results.

Literature review. Climate change and its adaptation have been addressed by several authors and researchers, who have studied the problems in the field and proposed coping mechanisms, the application of which can have an impact on the development of the economy of our country too.

Referring to the above problem, Associate Professor Jessica Tierney of the University of Arizona notes that long-term studies show that climate change, especially in the recent period, is occurring at an unprecedented rate than in any past era¹.

Swedish scientist Svante Arrhenius noted that the accumulation of carbon dioxide in the atmosphere contributes to the increase of the average temperature of the Earth. His calculations show that if that process doubles, the average temperature of the Earth's surface will rise by $5^{\circ}C^{2}$.

According to Ludvig Melkumyan, the erosion of natural complexes in the last fifty years has led to the extinction of some plant and animal species, which has reached a large scale in Armenia as well. People mercilessly use the natural resources created and accumulated for millions of years, without considering their disastrous consequences³.

The characteristics of global nature use are determined by the international experience and the nature of international economic relations, based on the need for states to act together when solving ecological problems. Those operational methods and measures include organizational-legal, administrative, financial, and economic measures⁴.

Soil absorbs enormous amounts of carbon. Many soil and crop management practices can increase the organic carbon content of agricultural soils. Agriculture carbon stocks can also be formed through soil biomass. This method has three main directions:

- 1. Carbon management in plant systems.
- 2. Agroforestry.
- 3. Improvement of carbon stocks in pastures⁵.

According to UNDP Climate Change program coordinator Diana HarutYunyan, for sustainable economic development, it is necessary to correctly assess the risks associated with climate change and develop appropriate programs aimed at its adaptation. Taking into account the fact that RA is a mountainous country, she noted that as a result of each degree of temperature increase, the vertical zonation deviates upwards by about 200 meters⁶.

¹ Climate change: opinions of scientists, Tashkent 2022, page 6, source: <u>http://www.cawater-info.net/library/rus/clim-ch-2022-6.pdf</u>, last accessed 20/09/2023.

² Climate change: facts, hypotheses, opinions., <u>https://tass.ru/info/2445839</u>, last accessed 20/09/2023.

³ Melkumyan L. - Basics of ecology, Yerevan, 2008. <<Zangak - 97>>, 285 pages, page 3.

⁴ Gevorgyan S. - International environmental strategy, Yerevan << Thtesaget>>, 2004, 144 pages, page 89. ISBN 99930-77-69-0

⁵ Baghdasaryan A. - THE BASICS OF LOW EMISSIONS DEVELOPMENT STRATEGIES IN ARMENIA. PROSPECTS IN ENERGY AND AGRICULTURE SECTORS, Yerevan - 2020, 66 pages, page 45.

⁶ Diana Harutyunyan - CLIMATE CHANGE AS A FUNDAMENTAL GLOBAL PROBLEM AND A THREAT TO NATIONAL SUSTAINABLE DEVELOPMENT, page 8

Methodology. The research was carried out through a study of the field literature and statistical data, also descriptive, analytical methods were implemented. As a result, practical recommendations were presented.

Discussion. Climate change is the long-term temperature change that can be the result of cyclic changes in solar activity. Since 1800, human activity has had a significant impact on the above-mentioned phenomenon as a result of the use of fossil fuels. The use of fuel produces methane and carbon dioxide, which rise to the atmosphere of Earth and create the greenhouse effect.

The main sectors polluting the environment are industry, transport, agriculture, etc. The resulting climate changes have a negative impact on human health and quality of life.

Studies show that severe consequences can be avoided if the temperature rises only by 1.5°C, but there is a prediction that the temperature will rise by 2.5°C by the end of this century. This is evidenced by the report, created in 1972, about the conclusions of the United Nations Environment Program (UNEP).

Switching energy systems from using fossil fuels to renewable energy sources, such as solar or wind, will reduce the dangerous emissions that cause climate change. This process needs to start now and the amounts of fossil fuels need to be reduced by 6% per year¹:

Since there are natural processes that contribute to climate change and humans cannot influence them, the need to adapt to climate change is emphasized, which aims to protect people, ecosystems, infrastructure, living conditions, and livelihoods. These measures require large financial investments, but inaction can cost humanity more than just financial costs.

To combat climate change and its negative consequences, on December 12, 2015, in Paris, several countries adopted the Paris Agreement. This agreement, which entered into force a year later, aims to significantly reduce global greenhouse gas emissions and limit the rise in global temperatures to 2°C over the next century while finding ways to limit that increase to 1.5°. To date, 194 parties have joined the Paris Agreement².

The purpose of the agreement is for each party to develop an action plan to help reduce emissions and adapt to climate change. These programs must be renewed every 5 years. Depending on the geographical location of the country, global warming can be manifested by droughts, fires, floods, and rising sea levels, the effects of which must be assessed in order to be protected. The trends suggest that the implementation of

¹ Source: <u>https://www.un.org/ru/climatechange/what-is-climate-change</u>, last accessed 19/09/2023.

² Source: <u>https://www.un.org/ru/climatechange/what-is-climate-change</u>, last accessed 19/09/2023.

adaptation measures must occupy their decisive place, along with global actions to combat climate change¹.

The scale of climate change impacts all spheres of life, therefore adaptation actions and coping mechanisms must be large-scale. Adaptation measures may require significant investment and costs, but investments made upfront can save lives and reduce future costs.

A global investment of 1.8 trillion USD in climate change early warning systems to increase agriculture resilience, protect the world's forests and sustainably manage water resources, and build resilient infrastructure will generate 7.1 trillion USD in revenue in the form of avoided costs and various social and environmental benefits².

Due to its geographic location and the fact that it is a mountainous country, the climate in Armenia is formed by vertical zonation, the country has the problem of scarcity of land resources, water scarcity, as well as the limitation of forests, as a result of which environmental protection issues require a quick solution.

There are few forested areas in Armenia (10.4%), which are located at altitudes of 550-2500 m. The forests of Armenia are characterized by their conservation, special, and production significance. Forest ecosystems in Armenia have been defined as forests of global protection significance, as they belong to the Caucasus-Anatolian-Hyrkanian temperate forest eco-zone. However, deforestation and illegal logging are evidence of poor law enforcement as well as poverty³. Table 1 presents data on forest areas and illegal deforestation in RA.

Table 1

	2017	2018	2019	2020	2021
Forested lands (1000 ha)	289.2	289.2	289.2	289.2	289.2
Total deforested area, ha	2010	2015	2240	36317	39119
Number of illegally felled trees	30720	12821	7228	12978	18674
Reforestation, ha	9.0	17.2	126.3	0.8	3.3

Forest areas in RA and illegal deforestation in RA from 2017-2021⁴

Emissions of harmful substances released by transport and stationary sources also have a significant negative impact on climate change, and the amount of those emissions is increasing year by year. Added to all this is the amount of waste generated as a result of the activities of productions and organizations, and only a small part of it is

¹ Report of the UN. As the impact of climate change increases, adaptation to it should become a global priority, source: <u>https://www.unep.org/ru/novosti-i-istorii/press-reliz/doklad-oon-po-mere-usileniyavozdeystviya-izmeneniya-klimata</u>, last accessed 15/09/2023.

² Adaptation to climate change, source: <u>https://www.un.org/ru/climatechange/climate-adaptation, last accessed</u> 20/09/2023.

³ UN DEVELOPMENT PROGRAM, page 5, source: <u>http://www.nature-ic.am/Content/posts/3623/TNC</u> <u>PRODOC arm with%20signature%20page.pdf</u>, last accessed: 05/09/2023.

⁴ Source: <u>https://armstat.am/file/doc/99533288.pdf</u> , last accessed 02/09/2023.



neutralized or reused. The graphs below show emissions data by year (Figure 1.) and by region (Figure 2.).

Figure 1. Emissions data from 2017-2021¹



Figure 2. The volumes of emissions by RA regions from 2016-2021²

¹ Source: <u>http://www.mnp.am/shrjaka-mijavayr/artanetumner</u> , last accessed 05/09/2023.

² Source: <u>http://www.mnp.am/shrjaka-mijavayr/artanetumner</u> , last accessed 19/09/2023.

IN 2017 the amount of harmful substances released into the atmosphere from stationary sources of emission was 141.3 thousand tons, the number of stationary sources was 3 334, 74.4% of which had approved limit permissible standards. The amount of harmful substances separated from stationary emission sources was 239.7 thousand tons, of which 41.1% was captured, and the remaining 58.9% was released into the atmosphere. The number of harmful substances emitted into the atmosphere from mobile sources was 149.8 thousand tons. Among them, carbon dioxide had a large share - 108.7 thousand tons or 72.6% of total emissions, volatile organic compounds - 24.7 thousand tons or 16.5%, nitrogen oxides - 15.8 thousand tons or 10.6%.

In 2018 the number of stationary sources of emission was 2,624, 71.8% of which had approved limit-permissible standards. The amount of harmful substances separated from stationary emission sources was 243.8 thousand tons, of which 53.2% was captured, and the remaining 46.8% was released into the atmosphere. The amount of harmful substances released into the atmosphere from mobile sources was 149.4 thousand tons. Among them, carbon dioxide had the largest share - 109.2 thousand tons or 73.1% of total emissions, volatile organic compounds - 24.3 thousand tons or 16.3%, and nitrogen oxides - 15.5 thousand tons or 10.4%.

In 2019 the number of stationary emission sources was 3,363. The amount of harmful substances separated from stationary emission sources was 211.1 thousand tons, of which 57.5% was captured, and the remaining 42.5% was released into the atmosphere. The amount of harmful substances released into the atmosphere from mobile sources in 2019. made 178.2 thousand tons. Among them, carbon monoxide had a large share - 73.0% of total emissions, volatile organic compounds - 16.6%, and nitrogen oxides - 10.0%.

In 2020 the number of stationary emission sources was 3,422, 74.3% of which had approved limit-permissible standards. The amount of harmful substances separated from stationary emission sources was 257.2 thousand tons, of which 66.5% were captured, and 33.5% were released into the atmosphere. The amount of harmful substances released into the atmosphere from mobile sources in 2020 was 209.2 thousand tons. Among them, carbon oxide had a large share - 72.4% of total emissions, volatile organic compounds - 17.2%, and nitrogen oxides - 10.0%.

In 2021 atmospheric emissions amounted to 308.9 thousand tons, 69.6% of which fell to mobile emission sources, and 30.4% to stationary sources. The number of stationary sources of emission was 3,291, 74.9% of which had approved limit-permissible standards. The amount of harmful substances released into the atmosphere from stationary sources was 93.8 thousand tons. The amount of harmful substances released into the atmosphere from mobile sources in 2021 was 215.1 thousand tons. Among them, carbon dioxide had the largest share - 155.9 thousand tons or 72.5% of

total emissions, and volatile organic compounds - 37.0 thousand tons or 17.2%, nitrogen oxides - 21.3 thousand tons or $9.9\%^{1}$.

Agriculture, which provides 43% of the total employment of Armenia, with its share of 18% of GDP, is also highly vulnerable to the effects of climate change². Taking into account the importance of the agriculture sector in the RA economy, its great strategic importance for the country's GDP and food security, and the fact that climate change directly affects the quantity and quality of agriculture production, it is necessary to develop and implement a system of measures for adaptation and mitigation of the consequences of climate change. The increase in temperature contributes to the rapid development and spread of plant diseases and pests.

Unfortunately, Armenia has already recorded a temperature increase of 1.3°, and parallel to this we have recorded a 9% decrease in precipitation levels. In other words, Armenia is already facing the climate change crisis today and ranks among the extremely risky countries. Those engaged in agriculture note that especially in recent years, the availability of irrigation water has decreased, which is related to the decrease in water flow from springs. All this can lead to serious legal security problems, and it is necessary to develop a strategy at the state level.

In developing and low-income countries, traditional agriculture continues to be the main source of income in rural areas and regions. Farmers do not consider adaptation strategies not only due to financial and technological constraints but also due to a lack of awareness of climate change and agriculture bilateral relations.

Climate change and the agriculture sector have a two-way impact. Multilateral cooperation is necessary to mitigate mutual negative effects because individual countries cannot solve these problems. The governments of the world must start their policies of intervention. At the same time, developed countries and international institutions should support developing and low-income countries in adaptation strategies. Developing countries, in turn, should work to raise awareness of the problem, which will enable a responsible private sector to change its management practices. Large corporations, along with governments, must invest in new technologies that are good for agriculture, as well as change food management systems. This policy can contribute to the sustainable development of the agriculture sector under the conditions of climate change.

The experts of the FAO have concluded that after 2030, as a result of climate change, especially in tropical regions, where the probability of further reduction of rainfall is greater, the yield of crops will decrease.

The impact of agriculture on climate change is determined by the emission of greenhouse gases, methane, nitrogen oxide, and carbon dioxide, into the atmosphere as a

¹ Source: <u>http://www.mnp.am/shrjaka-mijavayr/artanetumner</u>, last accessed 19/09/2023.

² UN DEVELOPMENT PROGRAM, page 5, source: <u>http://www.nature-ic.am/Content/posts/3623/TNC</u> <u>PRODOC arm with%20signature%20page.pdf, last accessed: 05/09/2023.</u>

result of agricultural activities. The use of pesticides and fertilizers affects air quality by releasing compounds such as phosphorus, nitrates, and ammonia.

Considering agriculture is one of the key and most important branches of the RA economy, it is simultaneously the most vulnerable to climate change. The predominant part of the income of the population of rural areas comes from agricultural production. Hydro-meteorological phenomena such as drought, hailstorms, floods, and mudslides have a negative impact on agriculture production, which leads to the bankruptcy of economic entities, resulting in emigration from the village to the city, and sometimes abroad. Climate change increases the risks of food security in the RA.

Climate changes, especially the high temperature in recent years, require the development of an appropriate strategy and adaptation of the agrarian policy to these challenges. There are 47 meteorological stations in RA that record air temperature and atmospheric precipitation data. According to these data, in 1929-1996 the average air temperature was above the norm by 0.4°C, and in 1929-2016 by 1.23°C. In the case of precipitation, in 1935-1996 the average level was 35 mm below the norm and in 1935-2016 was 50 mm lower than the norm. Tables 2 and 3 below provide data for 2005-2022 on average annual temperature and average annual precipitation.

Table 2

Average annual temperature data for 2005-2022¹

	2005	2010	2015	2016	2017	2018	2019	2020	2021	2022
Average annual	6,1	8,2	7,0	6,3	6,5	8,0	7,0	6,9	7,6	7,2
temperature ⁰ C										
Average temperature	0,6	2,7	1,5	0,8	1,0	2,5	1,5	1,4	2,1	1,7
deviation from the norm										
of the 1961-1990 period,										
° C										

Table 3

Average annual precipitation data for 2005-2022²

	2005	2010	2015	2016	2017	2018	2019	2020	2021	2022
Average annual	625	652,6	621	638,4	481,0	606,3	448,7	538,0	470,1	445,2
precipitation volume,										
mm										
Average annual	33	60,6	29	46,4	-111,0	14,3	-143,3	-54,0	-121,9	-146,8
precipitation deviation										
from the norm of the										
1961-1990 period, mm										

¹ The table was composed by the author using data from the "Hydrometeorology and Monitoring Center" SNCO.

² The table was composed by the author using data from the "Hydrometeorology and Monitoring Center" SNCO.

From the data in Table 1, it can be concluded that the temperature deviation has a positive tendency, and according to the data in Table 2, the deviation of the precipitation volumes has a negative tendency.

In recent decades, as a result of climate change, both in the whole world and in Armenia, the frequency and intensity of natural disasters have increased significantly¹.

As a result of climate change, such dangerous hydro-meteorological phenomena as hailstorms, droughts, floods, frosts, etc. have increased in our country.

In 2018 about 104 communities and 1762.9 ha of land were affected by hail in RA, and the damage amounted to 2.712 billion AMD².

Studies show that droughts occur almost every year in low-lying areas of RA, and the frequency of droughts in pre-mountainous regions is about 50% according to drought indices (the number of severe and very severe droughts) in 2000-2017. From 1975 to 2016 compared to the average (87), the frequency of drought increased by 33 cases or by 38%³.

As a result of changes in temperature and precipitation, we will have a 10-30% decrease in humidity, as a result of which a loss of the moisture content of plants will occur, which will significantly affect the yield of the crops. As a result of the decrease in snow cover, water flows on the surface will decrease, which will negatively affect the general water basin.

In 2021 atmospheric air quality observations were made in 10 settlements of the RA. The content of dust, metals in dust, nitrogen and sulfur dioxides, and ground-level ozone were studied in atmospheric air. Observations were carried out in Yerevan, Gyumri, Vanadzor, Alaverdi, Hraz-dan, Ararat, and Tsaghkadzor cities.

Meteorological observations were also carried out at 47 stations in RA, the data of which were analyzed and submitted to the input department using the "CLICOM" program. During the reported period, 100 warnings were issued regarding dangerous meteorological phenomena.

The fight against climate change can be done in two ways. The first is by reducing the anthropogenic causes of greenhouse gases generation and the second is by adapting to climate change.

The increase in the volumes of agricultural production is ensured either by the expansion of production, which can become a reason for the increase in emissions, or by the intensification of production. In the conditions of our country with scarce land, the method of intensification is preferable, which leads to more efficient use of resources. Expansion of production is profitable only if it is carried out at the expense of rehabilitation and use of degraded lands.

The Republic of Armenia, having scarce land resources, and few reservoirs, is very

¹ Third National Climate Change Communication of Armenia under UNFCCC, 2015

² Source: <u>https://www.arlis.am/DocumentView.aspx?docid=129659</u>, last accessed05/09/2023.

³ Third National Climate Change Communication of Armenia, 2015.

sensitive to any climate change. As a result of climate change, a 10-30% decrease in soil moisture is expected in RA, followed by a 25-30% increase in the risk of drought and water deficit. Therefore, compliance and mitigation measures for climate change are very important. For this, first of all, it is necessary to identify the main vulnerable issues and develop a list of actions and measures. In order to save water resources, it is necessary to build new reservoirs and improve the irrigation system to reduce losses. Climate change can also contribute to the expansion of the arial of both plant diseases and pests. Taking into account those risks, it is necessary to implement timely, modern agrotechnical measures and improve the genetic composition of crops by introducing drought-resistant varieties. It is necessary to carry out works aimed at desalination and improvement of the quality of saline soils with modern technologies. To implement afforestation measures. Armenia has a dry tropical climate formed by vertical zonation, the smallest variation of which will have a negative impact on the ecosystem. All sectors of agriculture from horticulture to animal husbandry are vulnerable, as many undesirable weather phenomena have become frequent for the sector. Climate change negatively affects the pastures, which in turn halts the development of animal husbandry.

According to the forecasts of the Ministry of Environment climate change in the Republic of Armenia will lead to an increase in temperature, a decrease in rainfall, and the shifting of the borders of land zones, soil moisture will decrease and desertification phenomena will accelerate, as a result of which desert, semi-desert and steppe areas will expand. There will be a reduction in the area of pastures and their yield¹.

To mitigate the expected negative consequences, it is necessary to emphasize the cultivation of more drought-resistant fodder crops.

The strategy of mitigating and adapting to global climate change includes solving the basic problems of abandoned and degraded lands, the policy of improving the quality of seeds and planting materials, the development of animal husbandry, and the promotion of sustainable development of organic agriculture.

Climate change can lead to serious legal security problems, to avoid which it is necessary to develop a strategy at the government level. It is necessary to increase the level of awareness, which will allow the responsible private sector to change its management practices. Climate changes, especially the high temperature in recent years, require the development of an appropriate strategy and adaptation of the agrarian policy to these challenges.

Taking into account the risks of climate change it is necessary to implement timely agrotechnical measures, to improve the genetic composition of crops by introducing dry-cold-tolerant varieties. It is necessary to carry out works aimed at desalination and quality improvement of saline soils with innovative technologies, as well as build new reservoirs and introduce a drip irrigation system. Implement afforestation and

¹ The Ministry of Environment of RA, Third National Report on Climate Change, 2015.

settlement conservation measures. Large corporations, along with governments, should invest in new technologies that are good for agriculture. This policy can contribute to the sustainable development of the agriculture sector in the conditions of climate change.

Scientific novelty. In the article, coping mechanisms were studied, developed, and justified, the application of which will help to resist climate change. They are the following:

- to avoid serious legal security problems, it is necessary to develop a strategy at the government level,
- increase awareness of the issue,
- develop an appropriate strategy and agrarian policy to respond to the challenges of climate change,
- implement modern agrotechnical measures,
- carry out works aimed at desalination and quality improvement of saline soils,
- improve the genetic composition of crops.

Conclusion. Climate change is considered a global issue. Studies show that Armenia is in a risky position in this regard. The adverse consequences of climate change can lead to serious food security problems and therefore the application of appropriate measures to combat these changes is very important.

In this article, we referred to the consequences of climate change, more specifically in the field of agriculture. Recommendations aimed at their mitigation have been made.

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ԿԼԻՄԱՅԻ ՓՈՓՈԽՈՒԹՅԱՆ ԲԱՑԱՍԱԿԱՆ ՀԵՏԵՎԱՆՔՆԵՐԸ ԵՎ ԴՐԱՆՑ ՀԱՂԹԱՀԱՐՄԱՆ ՄԵԽԱՆԻՋՄՆԵՐԸ

Լիանա Սամվելի Ազատյան Լևոն Աշոտի <ովնանյան

Համառոտագիր։ Երկրագնդի վրա կլիմայի փոփոխությունը դա ջերմաստիձանի երկարաժամկետ փոփոխություններն են, որոնք բացասական հետևանքներ են ունենում և անհրաժեշտություն է առաջանում միջոցառումներ ձեռնարկել դրանցից խուսափելու համար։

Շրջակա միջավայրը ախտորոշող հիմնական ոլորտներն են արդյունաբերությունը, էներգետիկան, տրանսպորտը, գյուղատնտեսությունը և հողօգտագործումը։ Սրանց հետևանքով առաջացած կլիմայի փոփոխությունները բացասաբար են ազդում մարդու առողջության, կյանքի որակի վրա։

Քանի որ կան բնական պրոցեսներ, որոնք նպաստում են կլիմայի փոփոխությանը և մարդը չի կարող ազդել դրանց վրա, ապա կարևորվում է կլիմայի փոփոխությանը հարմարվելու անհրաժեշտությունը, որի նպատակն է պաշտպանել մարդկանց, էկոհամակարգերը, ենթակառուցվածքները, կենցաղային պայմանները, ապրուստի միջոցները։

Այս խնդիրների կարևորությամբ է պայմանավորված թեմայի ընտրության արդիականությունը։

Հոդվածի հիմնական **նպատակն է** բացահայտել կլիմայի փոփոխության հետևանքով առաջացած խնդիրները և առաջարկել դրանց դիմակայելու ուղիները։

Գիտական նորույթը։ Հոդվածում ուսումնասիրվել, մշակվել և հիմնավորվել են մոտեցումներ, որոնց կիրառումը կնպաստի դիմակայել կլիմայի փոփոխություններին։

Դրանք հետևյալներն են.

- պարենային անվտանգության լուրջ խնդիրներից խուսափելու համար անհրաժեշտ է կառավարության մակարդակով մշակել ռազմավարություն,
- բարձրացնել խնդրի վերաբերյալ իրազեկվածությունը,
- մշակել համապատասխան ռազմավարության և ագրարային քաղաքականության համապատասխանեցում ԿՓ մարտահրավերներին,
- իրականացնել ժամանակակից ագրոտեխնիկական միջոցառումներ,
- իրականացնել աղակալած հողերի աղազերծման և որակի բարելավմանն ուղղված աշխատանքներ,
- բարելավել մշակաբույսերի գենետիկական կազմը։

Բանալի բառեր. կլիմայի փոփոխություն, հարմարվողականություն, բնապահպանություն, գյուղատնտեսություն, հողօգտագործում, պարենային անվտանգություն, ռազմավարություն։

НЕГАТИВНЫЕ ПОСЛЕДСТВИЯ ИЗМЕНЕНИЯ КЛИМАТА И МЕХАНИЗМЫ ИХ ПРЕОДОЛЕНИЯ

Лиана Самвеловна Азатян Левон Ашотович Овнанян

Аннотация. Изменение климата на Земле – это долговременные изменения температуры, имеющие негативные последствия, во избежание которых необходимо принимать меры.

Основными отраслями, загрязняющими окружающую среду, являются промышленность, энергетика, транспорт, сельское хозяйство и землепользование. Возникающие в результате изменения климата оказывают негативное влияние на здоровье и качество жизни человека.

Поскольку существуют естественные процессы, которые способствуют изменению климата, и человек не может на них повлиять, подчеркивается необходимость адаптации к изменению климата, целью которой является защита людей, экосистем, инфраструктуры, условий жизни и средств к существованию.

Актуальность статьи определяется важностью этих вопросов.

Основная цель статьи – выявить проблемы, вызванные изменением климата, и предложить пути борьбы с ними.

Научная новизна. В статье изучены, разработаны и обоснованы подходы, применение которых поможет противостоять изменениям климата:

- Необходимо разработать стратегию на правительственном уровне, дабы избежать серьезных проблем с продовольственной безопасностью.
- Повысить осведомленность о проблеме.
- Разработать соответствующую стратегию и адаптацию аграрной политики к вызовам КП.

- Реализовать современные агротехнические мероприятия,
- Проводить работы, направленные на опреснение и улучшение качества засоленных почв.
- Улучшить генетический состав сельскохозяйственных культур.

Ключевые слова: изменение климата, адаптация, охрана окружающей среды, сельское хозяйство, землепользование, продовольственная безопасность, стратегия.

THE NEGATIVE CONSEQUENCES OF CLIMATE CHANGE AND THEIR COPING MECHANISMS

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Abstract. Climate change on the Earth is the long-term temperature changes that have negative consequences and it is mandatory to take measures to avoid them or mitigate their negative consequences.

The main economic sectors polluting the environment are industry, transport, agriculture, etc. The resulting climate change has a negative impact on human health and quality of life. Since there are natural processes that contribute to climate change and humans cannot influence them, the need to adapt to climate change is emphasized, which aims to protect people, ecosystems, infrastructure, living conditions, and livelihoods. **The relevance** of the article is determined by the importance of these issues.

The main purpose of the article is to identify the problems caused by climate change and suggest coping mechanisms. The scientific novelty of the article lies in the fact, that approaches were studied, developed, and justified, the application of which will help to resist climate change. Those approaches are the following:

- to avoid serious legal security problems, it is necessary to develop a strategy at the government level,
- increase awareness of the issue,
- develop an appropriate strategy and agrarian policy to respond to the challenges of climate change,
- implement modern agrotechnical measures,
- carry out works aimed at desalination and quality improvement of saline soils,
- improve the genetic composition of crops.

Keywords: climate change, coping mechanisms, adaptation, environment protection, agriculture, land use, food security, policy.