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ISSUES OF ADAPTATION AND MITIGATION OF GLOBAL CLIMATE CHANGE IN THE SYSTEM OF THE US DEPARTMENT OF DEFENSE

Elov Ashrafjon
Chief Scientific Officer University of Public Security
of the Republic of Uzbekistan, Ph.D.
elovashraf@gmail.com

Abstract
This article outlines views on climate change and security, the need to combat climate change, regulations adopted by the U.S. Department of Defense to adapt to climate change and mitigate its effects, organizational units and their activities, measures and best practices implemented in the U.S. Armed Forces in this area. In particular, the laws on the authorization of national defense adopted by the US Congress in the period from 2018 to 2024 analyzed the measures that need to be taken taking into account the effects of climate change.

Keywords: USA, Department of Defense, climate change, army, climate impact, adaptation, danger, threat, assessment.

Introduction

The fact that climate change in general is changing the way of life of mankind, causing environmental, economic, political and social problems, in these conditions requires not only increasing the combat capability and readiness of the army, but also planning and developing the infrastructure of the Armed Forces taking into account the effects of climate change.

In particular, when military strategic experts and intelligence analysts think about the relationship between climate change and the Armed Forces, they note that the effects of climate change will directly affect the effectiveness of the mission, assets, infrastructure and operations of the Armed Forces. The restriction of water supply in regions vulnerable to climate change, the increase in droughts and famine indirectly

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affect the increase in the number of emergencies, the escalation of instability and conflicts, the increase in the number of mass migrations and famine.

According to the U.S. Department of Defense, climate change is now affecting U.S. military installations and related equipment. There are more than 5,000 U.S. Department of Defense military installations worldwide, of which more than 1,700 are located in coastal areas and are affected by sea level rise or extreme weather events or future impacts on them [1].

Since the consequences of global climate change "have a significant impact on the missions, plans and installations of the Ministry of Defense" [2], eliminating the resulting threats is considered one of the priorities of US national security.

Today, the United States is one of the few countries developing its military system taking into account climate risks. "Although several leading countries mention climate change in their defense policy documents, they do not have clear policy goals and tools" [3].

In this regard, it is important to study the experience of the US Department of Defense system in adapting to global climate change and mitigating its consequences, and the possibility of its implementation not only in the system of the Armed Forces of states, but also in all sectors of the economy.

LITERATURE REVIEW

Although environmental safety standards existed in the regulations of the US Department of Defense many years ago, climate change and the development of views on security have led to the emergence of the concept of "climate security".

Some scientists believe that "climate security" is part of "environmental security" [4]. We believe that climate security is broader than environmental security, and the effects of climate change cover all industries and industries. This also applies to relationships related to greenhouse gas emissions and other human activities affecting the environment.

In the USA, one can trace how modern views on "climate security", especially on the adaptation of the US defense system to climate change and preparation for its consequences, were first widely developed in the 2000s, when they were defined in official US documents.

The 2010 U.S. National Security Strategy outlined the initial official view of the threats of climate change, which stated that "the risks of climate change are real,

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urgent and serious. The changes caused by global warming will lead to new conflicts over refugees and resources; new challenges from drought and famine; natural disasters; and land degradation around the world" [5].

In expert reviews of the relationship between climate change and security, including "a serious threat to global security" [6], "acts as a multiplier of threats to instability in the most unstable regions of the world"[7], "the fact that climate change poses a threat to both military and national security interests, and that with it must be combated"[8], "since the impact on the armed forces is very great, and trillions of dollars are spent on defense, the defense sector must adapt to future climate hazards"[9], "crises related to climate change, They require the creation of special structures"[10], increases regional and local tensions in vulnerable areas ("hot spots"), exacerbates problems such as water shortages, food shortages and overpopulation, and accelerates instability [11]. However, it is noted that "little has been studied how this may affect the army's ability to perform operational and tactical tasks and devices"[12].

In its vision for adapting each sector of the US armed forces to climate change, it says: "our Navy has recognized this environment and mitigated the danger. ... We must start planning a similar approach to dealing with the effects of climate change on our national security."[13]

The WELDER model, designed to assess the impact of climate stressors on infrastructure and equipment in the US Department of Defense system, as well as related damage and service life changes, proved to be more effective than the Builder model [14].

DISCUSSIONS AND RESULTS

The United States was one of the first in the world to create an organizational and legal framework for adapting and mitigating the effects of climate change in the system of its armed forces, as well as to increase the readiness and sustainability of the army.

In October 2014, the US Department of Defense released a Roadmap [15] for implementing long-term efforts to adapt to the physical effects of climate change, reduce greenhouse gas emissions, and recognize the potential geopolitical consequences of climate change. This Roadmap has three main objectives, namely:

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"1) identification and assessment of the impact of climate change on the system of the Ministry of Defense;
2) Integration of climate change considerations into the system of the Ministry of Defense and management of related risks;
3) cooperation with internal and external stakeholders on climate change issues"[16].
In 2016, the Ministry of Defense Directive 4715.21 "Adaptation and resilience to climate change" was adopted [17], which establishes measures in five areas:
1) Decision-making based on climate impact assessment;
2) training and equipping forces capable of operating in extreme weather conditions;
3) creation of infrastructure to support military operations in a changing environment;
4) Ensuring the strength of the supply chain and innovation in hard-to-reach places;
5) Improving adaptability and resilience through collaboration with federal agencies, Congress, U.S. allies and partners, as well as other stakeholders.
However, after the 2020s, when the effects of climate change become more apparent in the system of the Ministry of Defense, it will be possible to observe increased measures to combat it.
Including Annual National Defense Authorization Laws, Climate Adaptation Plan (2021), Defense Climate Risk Analysis (2021), U.S. Army Climate Strategy (February 8, 2022), U.S. Navy Climate Action in 2030 (May 24, 2022), Air Force Action Plan to combat climate change (October 5, 2022) [18] and other regulations prescribe many measures.
It is worth noting that the US "acclimatization plan" covers the following main areas. Including
– Climate-informed decision-making. At the same time, climate change data is constantly updated and taken into account when making strategic, operational and tactical decisions in the US defense system;
– Train and equip a climate-ready Force. This includes training military personnel capable of working in the most extreme and adverse weather conditions, as well as adapting equipment to climatic conditions;
– Resilient built and Natural installation infrastructure. This includes ensuring the longevity of installations, testing them, updating building standards, maintaining or expanding ecosystem services, and improving the management of natural assets;
– Supply chain sustainability and innovation. This includes "stress testing" of the supply chain in war games and simulations, the transition to the American-made

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supply chain, support for climate-resilient and mitigation supply chain technologies, as well as the introduction of climate mitigation technologies such as micro grids and energy storage;

– Enhance adaptation and resilience through collaboration. At the same time, special attention is paid to research and cooperation in the field of new technologies, land-use planning, capacity-building of partner states, active participation in technical, academic and scientific exchanges, creation of common sustainability, improvement of common ecosystems.

We see that the annual US National Defense Authorization laws prescribe a number of practical measures to adapt the armed forces to climate change and combat the consequences.

In particular, in 2018, it was established that the US Department of Defense should identify vulnerabilities in military facilities and combat command requirements regarding the effects of climate change in the next 20 years and submit a report to the US Congress [19].

As of 2019, there is a need to take into account the increased resilience of infrastructure to the effects of climate change when designing all military structures in the Armed Forces system, especially in the Arctic region [20].

The U.S. National Defense Authorization Act of 2020 [21] provides for the assessment of climate vulnerability and risks in the defense system, ensuring the adaptation of the Navy to climate change and planning for increased resilience, financing measures to address climate change, the creation of an advisory council on climate security under the U.S. National Intelligence Council and the Director of National Intelligence.

That in 2021, increase funding for projects that increase the resilience of buildings and structures of the Armed Forces to climate, develop a plan and strategy for the Ministry of Defense on climate security, organize a round table on climate security at security academies, develop a mechanism for providing data to the advisory council on climate security, identify 10 facilities most vulnerable to the effects of climate change, in particular, an assessment of the weaknesses of the US Coast Guard, Measures are envisaged to assess the impact of permafrost melting on the assets and activities of the Ministry of Defense [22, 23].

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The National Defense Authorization Act of 2022 sets out tasks for assessing the effects of climate change and related threats to the areas underlying the system of the US armed forces:

1) operations (missions) and combat capabilities;

2) resistance to extreme weather conditions, droughts and desertification in the regions;

3) the situation in the areas of deployment of troops;

4) to strategic mainline railway networks, to strategic air and sea ports.

At the same time, the Ministry of Defense can develop tactics and exercises of war taking into account climate crises, analyze climatic hazards for the deployment of troops, conduct research and development necessary to ensure the stability of military equipment and facilities to future climatic conditions, use Air Force and National Guard fire extinguishing systems to combat forest fires of existing competence on issues related to By 2035, zero consumption of energy, water or waste will be provided for at least 10% of large military facilities, this will allow the military education system to organize training courses for commanders [24].

The National Defense Act of 2023 notes the growing threat to food security due to climate change, noting that this threat contributes to Global instability, undermining U.S. national security and the global economy.

This year's law provides for a number of programs to adapt the armed forces to climate change and mitigate its effects, including a “pilot program to establish interagency sustainability coordinators in various regions of the United States”, a “flood map report”, “energy efficiency programs” in each service, and a “pilot program to begin using sustainable aviation The development and implementation of the “program of international cooperation on environmental protection in the field of defense operational sustainability” is planned.

He was also instructed to create a center of excellence in environmental safety and a test site for impact resistance in the US Department of Defense system, and from 2035 to convert any purchased or leased non-tactical vehicle to electric or hydrogen fuel [25].

Even in 2024, reforms have been proposed that are a logical continuation of the above-mentioned reforms, which include improving estimates of greenhouse gas emissions, imposing an annual moratorium on requiring Defense Department contractors to report emissions, allocating $5.1 billion for investments in climate

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resilience and technology, electrification of tactical vehicles, increased preparedness and protection the environment at the expense of these funds. integrating landscape conservation and increasing resilience (around military installations), we can mention the development of an electric vehicle charging plan at the base, the inclusion of the strength of military facilities in official guidance documents, making technical adjustments to the program of international cooperation in the field of resistance to defense operations with partner countries that do not have a permanent military force, support for forecasting extreme weather conditions and improvement of forest fire extinguishing capabilities, as well as other measures [26].

In May 2024, the head of the Pentagon, Lloyd Austin, noted a change in the "Arctic national strategy" of the United States, taking into account changes in the state of the environment, global warming and its consequences [27].

Within the framework of the US defense system, a number of organizational structures have been created on climate change issues, whose activities are aimed at exploring and eliminating various interrelationships between climate change and military activities.

These structures include [28], including the national climate working Group, the Federal Council of Civil Society, the accountable 24/7 CFE working group, the accountable Operational energy working group, the accountable climate literacy working group, the accountable electric vehicle fleet charging working group, the accountable Wargaming Working group, the accountable working group on climate change adaptation working group on water resistance, the United States group on combating climate change, the working group on sustainable development, etc.

In addition, in 2024, the NATO Center of Excellence in Climate Change and Security (ccascoe) will be established in the United States, whose main task is to conduct research and share best practices in combating climate security risks [29].

Despite the above measures, the International Military Council on Climate and Security notes that the United States is "concerned about climate change, including real risks to global stability, conflicts and military missions" [30]. Therefore, efforts are continuing today to integrate climate change mitigation and adaptation measures into the long-term "policies, strategies and cooperation commitments" of the Ministry of Defense. [31]

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CONCLUSIONS

Studying the experience of the US Department of Defense in the field of combating climate change allows us to draw conclusions that are useful for others. In particular, the US Department of Defense was one of the first in the world to take concrete measures to mitigate and adapt to climate change. In particular, assessing climate risks in the system of the US Armed Forces, improving the resilience of military infrastructure to climate change, adapting equipment used in the army to climate change, developing strategies and plans to identify and respond to threats, assessing vulnerability and establishing sustainability requirements, ensuring energy sustainability, developing a flood protection system reducing energy consumption, the focus is on increasing the budget for research in this area.

A number of normative legal acts have been adopted to create a legal basis for these relations. The main ones are the law on the authorization of national defense and the "Adaptation Plan". The experience of the US Department of Defense in adapting to climate change and mitigating its consequences should be applied both to the armies of other countries and to civilian organizations.

PROPOSALS

1. Taking into account the fact that the effects of climate change are a multiplier of threats to security around the world, especially destabilizing the socio-political situation in regions vulnerable to climate change, States define in their defense doctrines the likely threats posed by climate change.
2. Taking into account the threat of climate change when developing strategies for the development of the armed forces system in the future.
3. Taking into account the breadth of the contribution of the Armed Forces to climate change in each country, States should develop "Climate Change Adaptation and Mitigation Plans" of the country's defense ministries.
4. Identify 10 vulnerabilities of the armed forces system to global climate change and take measures to eliminate them.

REFERENCES

1. Kelley M. Sayler, Hibbah Kaileh, Climate Change and Adaptation: Department of Defense. Congressional Research Servici. In Focus. April 6, 2023. https://crsreports.congress.gov/product/pdf/IF/IF12161

Global Economic Review: Journal of Economics, Policy, and Business Development
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2. U.S. Department of Defense. Tackling the Climate Crisis // https://www.defense.gov/spotlights/tackling-the-climate-crisis/#:~:text.
3. Yamani Amakrane, Robbert Biesbroek, How is the military and defence sector of EU member states adapting to climate risks?, Climate Risk Management, Volume 44, 2024, ISSN 2212-0963, https://doi.org/10.1016/j.crm.2024.100609. https://www.sciencedirect.com/science/article/pii/S2212096324000263.
4. Jordan Beauregard, Understanding the Climate Change–National Security Nexus: The Three Faces of Climate Security, Modern War Institute, September 14, 2020 // https://mwi.westpoint.edu/understanding-the-climate-change-national-security-nexus-the-three-faces-of-climate-security/
5. USA. NATIONAL SECURITY STRATEGY. May 2010. – P. 47. // https://obamawhitehouse.archives.gov.
6. Obama B. Address at Coast Guard Academy. New London, CT, May 20, 2015. https://www. whitehouse.gov/the-press-office/2015/05/20/remarkspresident-united-states-coast-guard-academycommencement
7. Noel L. Gerson, National security and the threat of climate change // https://www.cna.org/archive/CNA_Files/pdf/national%20security%20and%20the%20threat%20of%20climate%20change.pdf. – P. 6.
8. John Conger. How Climate Threats are Addressed in the National Defense Authorization Act. Council on Strategic Ricks. February 23, 2024. // https://councilonstrategicrisks.org/2024/02/23/how-climate-threats-are-addressed-in-the-national-defense-authorization-act/
9. A. Scollick. The Irish defence forces in a changing climate: Implications and suggestions for preparedness, adaptation and mitigation measures. Irish Defence Forces Review. (2022) https://andyscollick.files.wordpress.com
10. American Security Project. (2012). PART TWO: CLIMATE CHANGE & GLOBAL SECURITY. – P. 12. American Security Project. http://www.jstor.org/stable/resrep05971
11. American Security Project. (2012). PART TWO: CLIMATE CHANGE & GLOBAL SECURITY. American Security Project. http://www.jstor.org/stable/resrep05971
12. Gregg Garfin, Donald A. Falk and othe., A new mission: Mainstreaming climate adaptation in the US Department of Defense, Climate Services, Volume 22, 2021,

Global Economic Review: Journal of Economics, Policy, and Business Development
ISSN: 2980-5287
Volume 01, Issue 07, July 2025
Website: ecomindspress.com

ISSN 2405-8807, https://doi.org/10.1016/j.cliser.2021.100230. // https://www.sciencedirect.com/science/article/pii/S2405880721000182
13. Noel L. Gerson, National security and the threat of climate change // https://www.cna.org/archive/CNA_Files/pdf/national%20security%20and%20the%20threat%20of%20climate%20change.pdf. – P. 41.
14. Peter Larsen, Michael Grussing and otheres. Weather effects on the lifecycle of U.S. Department of Defense equipment replacement (WELDER), Building and Environment, Volume 259, 2024, 111639, ISSN 0360-1323, https://doi.org/10.1016/j.buildenv.2024.111639.//https://www.sciencedirect.com/science/article/pii/S0360132324004815
15. Davenport, C., 2014. Pentagon signals security risks of climate change. New York Times. https://www.nytimes.com/2014/10/14/us/pentagon-says-global-warming-presents-immediate-security-threat.html?searchResultPosition=1.
16. US DoD (United States Department of Defense). 2014. The 2014 Climate change adaptation roadmap. Released by the Office of the Deputy Under Secretary of Defense for Installations and Environment (Science & Technology Directorate) June 2014. Washington, DC: Department of Defense.
17. US DoD (United States Department of Defense). 2016. DoD Directive 4715.21: climate change adaptation and resilience. Released by the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. Issued January 14, 2016. Washington, DC: Department of Defense
18. Department of Defense, Office of the Undersecretary of Defense (Acquisition and Sustainment). 2022. Department of Defense Climate Adaptation Plan 2022 Progress Report. Report Submitted to National Climate Task Force and Federal Chief Sustainability Officer. 4 October 2022. – P. 2.
19. H.R.2810 - 115th Congress (2017-2018): An act to authorize appropriations for fiscal year 2018 for military activities of the Department of Defense, for military construction, and for defense activities of the Department of Energy, to prescribe military personnel strengths for such fiscal year, and for other purposes, – Sec. 355. H.R.2810, 115th Cong. (2017), https://www.congress.gov/bill/115th-congress/house-bill/2810.
20. H.R.5515 - 115th Congress (2017-2018): An act to authorize appropriations for fiscal year 2019 for military activities of the Department of Defense, for military construction, and for defense activities of the Department of Energy, to prescribe

Global Economic Review: Journal of Economics, Policy, and Business Development
ISSN: 2980-5287
Volume 01, Issue 07, July 2025
Website: ecomindspress.com

military personnel strengths for such fiscal year, and for other purposes, H.R.5515, 115th Cong. (2018), https://www.congress.gov/bill/115th-congress/house-bill/5515.
21. S.1790 - 116th Congress (2019-2020): National Defense Authorization Act for Fiscal Year 2020, S.1790, 116th Cong. (2019), https://www.congress.gov/bill/116th-congress/senate-bill/1790.
22. H.R. 6395 - 116th Congress (2020-2021): National Defense Authorization Act For Fiscal Year 2021 Conference Report To Accompany, (2020), https://docs.house.gov/billsthisweek/20201207/CRPT-116hrpt 617. pdf
23. Climate Security in the 2021 U.S. National Defense Authorization Act. August 17, 2020. By John Conger // https://councilonstrategicrisks.org/2020/08/17/ climate-security-in-the-2021-u-s-national-defense-authorization-act/
24. S.2792 - 117th Congress (2021-2022): National Defense Authorization Act for Fiscal Year 2022, S.2792, 117th Cong. (2021), https://www.congress.gov/bill/117th-congress/senate-bill/2792.
25. H.R.7776 - 117th Congress (2021-2022): James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, H.R.7776, 117th Cong. (2022), https://www.congress.gov/bill/117th-congress/house-bill/7776.
26. H.R.2670 - 118th Congress (2023-2024): National Defense Authorization Act for Fiscal Year 2024, H.R.2670, 118th Cong. (2023), https://www.congress.gov/bill/118th-congress/house-bill/2670.
27. https://www.rbc.ru/politics/08/05/2024/663bd23a9a7947fe3a95e712
28. Department of Defense, Office of the Undersecretary of Defense (Acquisition and Sustainment). 2022. Department of Defense Climate Adaptation Plan 2022 Progress Report. Report Submitted to National Climate Task Force and Federal Chief Sustainability Officer. 4 October 2022. –P.9.
29. IMCCS at the 75th NATO Summit: Launching the Climate Change and Security Center of Excellence and the World Climate and Security Report. July 16, 2024 // https://imccs.org/2024/07/16/imccs-at-the-75th-nato-summit-launching-the-climate-change-and-security-center-of-excellence-and-the-world-climate-and-security-report/
30. https://imccs.org/
31. https://www.defense.gov/spotlights/tackling-the-climate-crisis/