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North Atlantic Treaty Organisation's climate change risk management responsibilities

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Abstract

Aim: This article aims to study NATO's attitude towards climate change and its policies against the negative impact climate change poses. The article also aims to show how NATO's strategic objectives are affected by current ecological challenges.

Methodology: Analysing the topicality with the help of index databases, primarily using data from ScienceDirect and Google Scholar. The authors analyse and evaluate the security challenges related to NATO's function, primarily based on security aspects of climate change, public extracts of NATO summits, materials of related action plans and world conferences, technical reports of decision-making and other bodies, as well as other publication.

Findings: The security environment is undergoing a vigorous change. Despite of the fact that the global policies, migration and acts of terrorism are on the rise, economic and social consequences based on environmental damage are even more complex, armed conflicts and crises evolve – all that require NATO to respond. However, besides classic strategic objectives, NATO has to take the damaging effects of climate change, participating in the execution of sustainable development objectives, energy security, etc. into account. Thus, encouraging the military dialectics to study theoretical and practical issues of natural and social sciences, enforcing awareness-raising. It further enforces the tendency to study the adaptability and integrability of mainstream environment trends.

Value: The analysing-evaluating work of the authors covers a wider spectrum of NATO's task system, thus including unusual or not-so-well-known and not-so-popular, yet necessary topics besides the classic ones.

Keywords: NATO, security challenges, sustainable development, energy security

Introduction

After the second world war – based on the topic of this publication –, two significant elements can be highlighted. One of them is the foundation of the North Atlantic Treaty Organisation, and the other one is a fast-paced technological development in the 20th century. The concentration of the communities was caused by the realignment of European military and power forces. The previously made (forced)alliances with the Soviet Union brought the most basic safety influencing factor for western European countries (Nagy, 2014). The 20th century was the century of wars and armed conflicts, and approximately half of it was the so-called cold war period (Bardócz et al., 2001; Szatai & Horváth, 2020). During the Cold War, standpoints and objectives related to national defence were prioritised, however, several technological innovations were created – besides military development –, the results[1] of which can be felt in the 21st century as well. Despite all the positive effects – such as economic growth, well-being and stability – there have been caution signs and critical voices since the late 1960s (Carson, 1962; Ehrlich, 1968; Meadows, Meadows, Randers & Behrens, 1972; Ehrlich & Ehrlich, 1995; Bulla & Tamás, 2006; Kuthi, 2001; Teknős, 2013). According to Kerekes (2007), the environmental crisis came forth like a shooting star in the late 1960s and early 1970s, as the academic elite started to recognise its global aspect then. According to Rakonczai (2003) too, the globalisation of environmental issues became clear in the 1960s. In the 1970s acid rain, and in the 1980s the hole in the ozone layer was in focus. During the global development, a number of environmental issues arose. Due to the imbalance of the three elements – nature, society, and economy – several ecological and human world crises evolved (Hajnal, 2006; Tóth, 2007; Baranyai et al., 2018; Kapás, Balázs, & Káposzta, 2022), which have a clear effect on security, as these enforce the risk of civilisational conflicts (Rada, 2007; Hufnagel et.al., 2008; Teknős, 2013; Gazdag, 2014; Fülöp, 2018; Hetesi & Kiss, 2018; Szöllősi-Nagy, 2022). By the 21st century, locality became globality (Faragó et al., 2004). In this process, the accelerating pressures in the warming pace of climate change have a risk-increasing effect, whose national defense, law enforcement, sociological, psychological, economic (agricultural, industrial, financial), social, ecological consequences determine the adaptation processes and the global and local resilient defense methods in their fundamentals influencing the components and elements

1 Aeroplane, combustion engine, conveyor belt, reflector, television, frozen food, air conditioning, the theory of relativity, telegraph, radar, mobile phone, microwave oven, computer, radio, nuclear energy, x-ray, ultrasound, microchip, laser, industrial robots, internet, solar panels, etc.

of international security. The growth of the role of the technosphere as a global techno-social energy-consuming system (Haff, 2013), the horizontal and vertical limitation of the available strategic raw materials, the stable sustainability of the standard of living all require research in the fields of society and the natural sciences, its security aspects, and the evaluation of possible responses to the growing social security needs, the examination of the role of organisations with potential response competences, such as the North Atlantic Treaty Organisation (NATO), the identification of external and internal constraints related to the vision of the future (e.g. geostrategic competitions, migration, the growing nature of causes causing disasters, environmental deterioration, climate change, security aspects, radicalism, demographic changes, economic crises, etc.).

Topicality and significance

In order to examine topicality, the authors reviewed ScienceDirect open access publications managed by the Dutch publishing house Elsevier, as well as works found in Google Scholar.

In ScienceDirect, a total of 1,572 items can be read between 1999-2021 for the keyword 'NATO and climate change'. These are distributed as follows[2]: The vast majority are journal articles (919), 91 review articles, 247 book chapters, 91 encyclopaedias, 39 conference abstracts, 28 editorial materials. From an academic point of view, conference info, news, summaries and other categories are not relevant. NATO's written discourses on climate change are mainly in journals, review articles and book chapters in ScienceDirect (URL1). Regarding the first 5 fields, 452 works are related to social sciences, 277 to earth and planetary sciences, 265 to environmental sciences, 177 to agricultural and biological sciences and 167 to energy. In these categories, many writings cover food security, water security, geopolitical situations, armed conflicts, etc., processing it based on different aspects. The following conclusion can be drawn: very few publications specifically deal with the relationship between NATO and climate change.

In Google Scholar (Google's scientific search engine, also searching for digitized works of Hungarian libraries since 2006), a total of 95,500 items were published for the keywords 'NATO and climate change' with a time interval setting of 1900-2021. In this search, works that deal more specifically with the topic can be found. From the point of view of security science, there are more

2 Last query 23/07/2022.

works related to the topic on Google Scholar than in ScienceDirect. Overall, there are still not enough works dealing with the relationship between NATO and climate change in the international databases, but there is a very rich literature in relation to the individual sub-areas (food and water security, agriculture, etc.). The effects of climate change on security are studied by many authors, but the literature is more moderate with regard to NATO specifically. The topicality is supported by the fact that the works dealing with security claim that in the 21st century, environmental and civilisational challenges, threats, dangers and risks will increase (Boda, 2014). The consequence of this is that security-related needs of societies also grow, which realises and demands the analysis, evaluation and writing of studies dealing with security and environmental topics.

Research methods

Taking into account the significance of the topic, as well as its topicality, the authors analyse the security aspects of climate change, especially by determining the expected prognoses of international geopolitical instability. NATO's reactions to climate change (attitude, adaptations), its risk management steps, and the crisis response mechanisms themselves (from training to operational planning) are examined. NATO's forums for dialogue between the United Nations and the European Union, academic content, factors influencing decision-making, theoretical and practical questions of security and defence policy competence are evaluated. How the strengthening of NATO's military effectiveness (due to the increasing trends and the obligation to respond to the more complex nature of the real threats of the changing security environment) is compatible with today's sustainable development objectives, environmental and climate protection efforts, and internationally accepted commitments is also examined.

Statistical analysis of the international and domestic effects of environmental problems, human and ecological crises, climate change and extreme weather phenomena by the Copernicus Climate Change Service, Munich Re, (NatCat-Service), UN Office for the Coordination of Humanitarian Affairs (UN OCHA), the European Environmental Protection Agency (EEA), are implemented on the basis of the EM-DAT international disaster protection databases of the meteorological services of the countries involved in the Framework Convention.

The information used for the topicality and data analysis related to publications was obtained based on the ScienceDirect and Google Scholar databases. Summary reports of NATO summits, action plans, world meetings, conference materials, agreements, decision-making and other professional summaries

(Intergovernmental Panel on Climate Change-IPCC, National Oceanic and Atmospheric Administration-NOAA, United Nations Office for Disaster Risk Reduction-UNDRR, World Meteorological Organization-WMO) were used in order to analyse the current situation of security challenges. For the statistical analysis of natural disasters, data from the International Disaster Database (EM-DAT), the Copernicus Climate Change Service and the NatCatService were used.

The connection between climate change and global security

With the break-up of the Warsaw Pact and the Soviet Union on 31 March 31 1991, the security situation in Europe changed dramatically, the chance of a global conflict decreased, but the regional importance of military power increased (Simai, 2020). Despite the breakdown of the bipolar order, however, it could not be said that the world has become safer (Siposné Kecskeméthy, 2014; Szenes & Siposné Kecskeméthy, 2019). In this regard, László Csaba says that Samuel Huntington's pessimistic vision of the world has been realised (Csaba, 2018), as, for example, the number of crises is also increasing (the state between conflict of interest and violent conflict, i.e. war) (Matus, 2008; Resperger, 2016). After the Cold War, the international environment fundamentally changed (Rada, 2007). Of the two large opposing military blocks, the Soviet Union and its federal system disintegrated, NATO was significantly transformed, the European Union also expanded, and the accession negotiations of the Central European countries under former Soviet rule to NATO and the European Union were on the agenda. International relations became closer and closer, which meant strong bonds, situations of adaptation, dependence, and obligations for the collaborators. In addition to reliance on themselves, the need for collective security also came to the fore. The aim was no longer just to overcome the common danger resulting in survival, but also to ensure a more comprehensive well-being. With this, more attention was paid to areas such as environmental protection, climate protection, sustainable development, international disaster relief, humanitarian support (overcoming the cultural and political barriers of the system, etc.). This is also necessary because in the 21st century, classic and modern challenges, threats, and dangers reformed the interpretation of security, acquiring new, more complex parameters and contents (Zán, 2004; Gazdag & Tálas, 2008; Matus, 2008; Gazdag, 2008; Petkovich, 2016; Siposné Kecskeméthy, 2014; Szenes & Siposné Kecskeméthy, 2019). According to Lippert (2016), it is precisely this changing context that results in topics such as the security aspects of climate change becoming NATO's area of interest (Lippert, 2016). Security – according

to a simplified interpretation – means the absence of threat, danger and risk, a kind of risk-free state (Taksás, 2013; Gazdag & Remek, 2018) and the ability to cope with or prevent them, (Gazdag, 2008) includes response (from the point of view of disaster prevention) and protection mechanism (from an administrative perspective). Although security at the social level is a self-sustaining need that focuses on survival at the community level, unfortunately, at the turn of the millennium, it was not possible to provide an adequate answer regarding security, the environment, and social changes (Teknős, 2017; 2022a). International security and safe existence have grown into ever-increasing public needs (Teknős, 2015). Security is a fundamental community need and a legitimate demand at the same time. This is a notable social need, which nowadays leads to increasingly escalating decision-making (coercive) measures (see demonstrations for peace, environmental protection movements and demonstrations, climate actions and riots). This is only further enhanced by energy security, the consequences of the accelerating pace of climate change, public health, epidemiological, environmental and water pollution, industrialization, and the rapid increase in the number of the population, the reduction of usable fresh water resources (Treszkai, 2021), the tendency towards urbanization, the expansion of the built environment (giga- and megacities), dependence on infrastructure, deterioration of the state of the environment (erosions, pollution), migration, insufficient government measures in more unstable regions, terrorism, etc. (Teknős, 2022b).

The 20th century was the century of oil, and the 21st century is the century of water (URL2), and one of the greatest challenges for humanity will be the harmful effects of climate change and the devastating effects of natural disasters (Crossette, 1995; Strömberg, 2007; Mika, 2017; Szöllősi-Nagy, 2022).

Warmer (interglacial) and colder (glacial) periods followed each other, so that colder (stadial) and warmer (interstadial) cycles also alternate within the glacial periods. The climate has changed, is changing and will change (Faragó, 1990). This is a de facto, certified fact.[3] As is that the greenhouse effect is one of the most important climate-changing natural phenomena that helps the current forms of life to survive.

The Intergovernmental Panel on Climate Change (IPCC) synthesises new climate-related scientific findings and publishes summary reports. Six Situation Assessment Reports (1990, 1996, 2001, 2007, 2013-2014, 2018, 2022)

3 Act XLIV of 2020 about climate protection; Act LX of 2007 about the execution framework of the UN Climate Change Framework and its Kyoto Protocol; 23/2018 (X. 31.) Parliamentary resolution regarding the time period between 2018 and 2030, about the second National Climate Change Strategy that provides an outlook until 2050.

were published, which summarise the most important and latest international research results related to global climate change. According to IPCC reports, this is affected by human activity (air pollution, logging, technosphere, surface transformation, urbanization, globalization, lifestyle of developed countries, etc.) (O'Brien, O'Keefe, Rose &Wisner, 2006; Solomon et al., 2007; Bencsik, 2009; Padányi & Halász, 2012; Rakonczai, 2013; IPCC, 2007, 2015; Faragó & Bartholy, 2014). Neither climate sceptics nor climate deniers accept this position. One thing is certain: dangerous anomalies on a global scale can be observed (extreme weather, direct and indirect health effects, changes in living space, etc., reduction of icy areas) which already have a large impact on global security. Climate change is a multiplier of crisis.

IPCC writes in its 2007 report that in the 21st century it has become clear that environmental problems are increasing the number of civilizational conflicts, and even that the chances of wars are increasing as the Earth's carrying capacity decreases (IPCC, 2007). Jon Barnett, a researcher at the University of Melbourne, mentions the views of American professor Richard Anderson Falk in one of his works, according to whom the faster the pace of climate change and the resulting changes is, the more difficult it will be to adapt to the negative effects, which may even lead to armed conflicts (Barnett, 2001). According to Rymn J. Parsons, armed conflicts are primarily expected where the state's ability to act is already weaker, the power of the central government is weak, and the effects of climate change are more pronounced. This is supported by the University of Texas-Austin associate professor, Joshua W. Busby. According to him, climate change is a serious threat to international security. Climate change will cause international humanitarian disasters, contributing to the spread of political violence, which will occur primarily in countries with weaker governments (Busby, 2008). The US military will play an increasingly important role in armed conflicts and peacekeeping operations of individual countries (Barnett, 2001).

Natural disasters and events are perhaps the most 'unexpected' and overall, the most costly in terms of loss of human lives and resources. Natural disasters, whether they occur in developed or developing countries, clearly affect people's livelihoods (Sawada & Zen, 2014). The list of natural disasters includes weather phenomena such as tropical storms, extreme heat or extreme cold, winds, floods, earthquakes, landslides and volcanic eruptions. There is a connection between climate change and natural disasters, (Macapayag&Misic, 2015) in the case of some types, they even have stimulating effects in terms of occurrence and intensity (Teknős, 2015). There is also a connection (Busby, 2007; Mach, Kraan & Adger, 2019) between climate change and armed conflicts (Barnett, 2001), which reduce the effectiveness of resilience against disasters. A number

of ecological and human world crises have been identified (Anda, Burucs & Kocsis, 2011) which, without global actions, in addition to the standard of living of humanity reduces the conditions for survival. In the assessment of sustainability (Uitto & Shaw, 2016) and the fight against the negative effects of climate change from a disaster prevention point of view, disaster reduction is of particular importance. According to Indrajit Pal and his co-authors, 'The Sendai Framework for Disaster Risk Reduction (SFDRR), Paris Agreement, and Sustainable Development Goals (SDGs)' promote the effectiveness of (disaster) risk reduction mechanisms and the activities of governments in this direction, as they deal with central issues such as sustainable, fair (impartial) economic, social and environmental development (Pal, Meding, Shrestha, Ahmed & Gajendranl, 2020). Based on the knowledge of disasters, the results of data collection and statistical analyses, recommendations can be proposed to the government and decision-makers (Papp, 2019). Indrajit Pal and his co-authors state that disaster risk management (SFDRR) contributes to sustainable development, and sustainable development goals support disaster risk reduction (Pal et al., 2020). The goal of disaster prevention is to eliminate the causes, reduce the probability of occurrence, by creating response conditions, and reduce and moderate the damaging effects in the event of an occurrence. On a global level, one of the current results of this is the Sendai Framework Convention, which emphasizes that disasters are negatively affected by the intensity and frequency of climate change, significantly increasing the economic, social, health, cultural and environmental effects.

The European Commission's 'EU Strategy for Adaptation to the Effects of Climate Change' deals with the problem of climate change, current and expected European impacts, for adaptation measures (URL3). Based on the results of the report 'Climate change, its effects and the vulnerability caused by them in Europe, 2012', the strategy states that the consequences of climate change are increasingly felt in Europe and globally, which increase vulnerability and exposure to the effects. They cause economic disruptions (IPCC, 2012).

In the executive summary of the IFCR study 'Preparedness for climate change', it can be read that weather-related disasters are constantly increasing, and in order to reduce their consequences, governments, non-governmental organisations, citizens, economic operators, international organisations, humanitarian organisations need to cooperate (URL4).

Overall, it can be concluded that the negative effects of climate change and/or natural disasters and serious events modify the classic NATO tasks and priority areas, since, in addition to the classic strategic areas, NATO also has to deal with such things as the damaging effects of climate change, participation

in the meeting of sustainable development objectives, energy security issues, etc., which encourage the usual military way of thinking to study theoretical and practical issues in natural and social sciences, strengthening the formation of attitudes and the tendency to examine the adaptability and integrability of contemporary environmental mainstream trends.

NATO's response to the negative effects of global climate change

A fundamental question is whether NATO, as a (military) alliance, can 'extract' itself from today's mainstream environmental issues. No to the extent that, due to certain areas, it continuously becomes interested. Certain areas, such as energy issues necessary for operation, water and food crises, sea level rise, terrorist attacks, great power tensions due to the Northern Passage, etc. Of course, this list can be supplemented with further examples, but these a) are serious problems in themselves, individually, b) however, not all of them can be linked to climate change c) but a rapid change in the climate can result in an increase in efficiency, d) further individually and together, pose a considerable pressure on security on various levels (Lippert, 2016). The refugee crisis, the burden of migration, armed conflicts, long-lasting global epidemic situations, the uncontrollable forest fires[4] occurring on several continents, the rising trend of hydrological and meteorological events all weaken the economic power of nations, cause a decline in GDP, in addition to the continuous strain on the state's coping abilities, the ability to finance other areas is at risk. One might also say that in recent years, so many events of natural and civilizational origin have occurred in time and space[5], which directly or indirectly affect all countries on Earth. Another fundamental question is, if the defence burden of the states is this high, should more be sacrificed for economic, natural, social or military expenses in adapting to the changing security environment? It is absolutely clear that the above problems do not only affect civil societies and require them to respond but national defence, law enforcement, national security, etc. bodies and organisations as well.

4 By 16 July 2022, a total of 345,916 forest fires and outdoor fires were recorded on the European continent alone (URL5). In Hungary, compared to last year, between 1 February and 27 July 2021, three times as many outdoor fires (total of 11,146) were called to firefighting units as in the same period of 2022 (URL6). This means a total of 47,364 hectares (which is 473.64 km2) of burnt area by 27/07/2022, which is equivalent to 90% of the area of Budapest.

5 According to EM-DAT: 5763 events between 2012-2020, of which 558 in 2012; 2013: 543; 2014: 553; 2015: 601; 2016: 533; 2017: 542; 2018: 496; 2019: 611; 2020: 501; 2021: 585; Until 27/07/2022: 240 (URL7).

In addition to its classic topics, NATO is increasingly dealing with topics related to environmental protection[6], environmental security, sustainable development, and climate protection. In recent years, energy security and energy dependence have emerged as key strategic issues. However, the prioritized areas of international environmental protection and sustainability should be listed here, such as the continuous withdrawal of fossil energy carriers, and the widest possible use of renewable energy sources, which are fundamentally delimited by the so-called global sustainability objectives, or the Paris Agreement concluded on 12 December 2015. Among the climate protection measures, it is globally accepted that slowing down the rate of warming can best be achieved by reducing greenhouse gas emissions. However, this has required significant economic compromises.

The emission reduction activities undertaken so far, which are related to the 1992 Framework Convention on Climate Change[7] and the 1997 Kyoto Protocol – and its Doha Amendment – were not, and are still not adequate. Due to the experienced and measured effects, global action plans, according to reports, should not and cannot be postponed. The 2015 obligations imposed on developed and developing countries – see the Paris Agreement – are discussed every year at the so-called Conferences of the Parties (COP)[8] and already at the 2018 UN Climate Summit in Katowice (COP24) it became clear that the commitments made in 2015 are not enough to meet the 1.5ºC goal either. At the COP24 conference, the increasing rate of global temperature was confirmed, as well as the response that it should be kept within 1.5 degrees Celsius compared to pre-industrial levels until the end of the century. At the COP26 conference in Glasgow, the commitments of 2015 were confirmed, among them that the increase compared to the value before industrialisation cannot be more than 1.5 degrees Celsius, and the financial margin for adaptation will be increased to 40 billion dollars by 2025, and 500 MRD dollars will be set aside by 2023 for developing countries to achieve climate innovation activities, which will support global emission reduction in the long run. The conference also had a NATO aspect,

6 It should be noted that NATO has been involved in certain environmental protection issues, such as air and noise pollution and the disposal of hazardous waste, since 1967. In 2006, the NATO Scientific Committee merged with the CCMS and created the Science for Peace and Security (SPS) program, whose priority areas include environmental security, water management, natural disaster prevention, and energy security.

7 United Nations Framework Convention on Climate Change (UNFCCC).

8 Conferences of recent years: COP21: Le Bourget (Paris), 30 November – 12 December 12 2015; COP22: Morocco, November 7 – November 8, 2016; COP23: Bonn, 6 November – 17 November 2017; COP24: Katowice, December 2 – December 14, 2018; COP25: Marid, 2 December – 13 December 2019; COP26: Glasgow, 31 October – 12 November 2021. The next conference, COP27, is expected to be held in Sharm El Sheikh, Egypt, in November 2022.

as NATO Secretary General Jens Stoltenberg also participated in the Glasgow climate conference round table discussion. He said that himself had attended six COP conferences, the first of which was when the 1997 Kyoto Protocol was agreed upon. This information is also important because NATO's research on climate change is driven by the fact that the current Secretary General used to be the UN's climate commissioner, but before that he was also the prime minister of Norway, which country is famous for its environmental protection measures (URL8). At the round table, the NATO Secretary General emphasised that climate change affects security, and therefore approved the adoption of an action plan at the NATO Summit in June, prior to the COP26 conference. According to him, three important factors should be investigated, such as the connection between climate change and security, including how and in which parts climate change affects security. The other is the 'greening' of NATO, i.e. in what ways, can the environmental protection and sustainability aspects be taken into account ensuring that the operational efficiency is not damaged and the current capabilities are not adversely affected. The objective is to achieve climate-friendly armed forces. The third is to reduce and then eliminate the use of fossil fuels in military and other vehicles, as well as reduce the emissions of harmful substances from the operations themselves. This triple goal definitely supports the internationally accepted climate protection and mitigation objectives. This is also important because the logistics of fuelling vehicles and convoy-like transport always correspond to high-risk attack targets. The third is adaptation to negative influences and the resulting changing environment. The higher temperature range of the mission areas burdens the staff, however, it is more difficult to guarantee the success of operations, in windier, wetter, more extreme weather situations; nevertheless, the rise in sea level also affects the safe operation of several military bases.

NATO member countries realise that it is necessary to deal with the terrible but realistic consequences of climate change as an alliance collective. On the other hand, it is striking that military aspects and content related to emissions were not among the topics of the climate conferences[9] (URL9).

In NATO, it was not usual for the top leadership to participate in world climate change conferences (meaning: the UN COP conferences held annually since 1995), so the one-day visit to Glasgow in 2021 already indicates the expansion of NATO's interest and their commitment to the topic.

9 This also might be due to the fact that certain military capabilities can be determined from the level of emissions.

NATO has been dealing with environmental challenges for more than half a century, initially mainly from a scientific and research point of view. One of the priority research areas is related to energy security. NATO has been dealing with energy security in detail since 2006.

The specific steps to combat the effects of climate change can be linked to the year 2010, as climate issues and the security aspects of climate change were already dealt with prominently in the declarations of the NATO Summit in Lisbon. NATO's then Secretary General opened NATO Centre of Excellence for Energy Security in 2013, in Vilnius (URL10).

In this context, energy security issues were discussed together, the important stage of which was the 2013 Lithuanian-Danish initiative called 'Green Energy and Defence Initiative', which was ratified at the 2014 NATO Summit in Newport under the name 'Green Defence Framework' (URL11), and held three important objectives. On the one hand, a) increasing the efficiency of NATO operations by making use of the advantages arising from the technological and technical development of energy use, b) increasing the contribution to the related goals of sustainable development, c) using fewer resources to carry out the operations – in such a way that their effectiveness is not impaired (Padányi, 2021). With the Green Defence Framework, NATO increased the number of measures taken for energy security, taking another step towards a 'greener' NATO (URL12). To this end, NATO created the Smart Energy program in 2015, which encourages the replacement of traditional fuel consumption methods with alternative energy. This is more cost-effective and also improves operational agility (Padányi, 2021). It has a positive effect on the safety of the operations, as the energy supply chain will be smaller and the dependence on fossil energy carriers will decrease (Nyitrai, 2018).

In March 2021, NATO foreign ministers adopted the Climate Change and Security Action Plan, taking a significant step to integrate climate change-related measures into NATO's political and military agenda (URL13).

NATO Summit of June 14, 2021

The NATO Summit on 14 June 2021 was held in Brussels, which was the 31st official meeting of NATO heads of state and government. At this summit, in addition to emission reduction (mitigation), preparation and adaptation to negative effects also received special attention. Regarding the latter, the adaptation of combat vehicles and equipment to changing weather and environment, as well as the reduction of exposure, are increasingly standardization topics, as they affect operational efficiency. In relation to climate

change, among other things, the real dangers of armed struggles for water were also on the agenda. Among NATO's central topics, in addition to the classic threat, other crisis-increasing factors are also permanent bases for negotiations, which unfortunately – as a pessimistic scenario – will be a part of life as future risks. Adapting this to the changing security environment means an increasing probability over time. Topics also included the rapidly melting northern Arctic areas and the role of the Arctic Ocean in influencing geopolitics, where growing military presences and great power interests cause threats (Vigh, 2021). In addition to these, a significant problem is the millions of refugees who are forced to leave their places of residence due to the negative deterioration of the environment, access to drinking water and extreme weather anomalies.

On 14 June 2021, the conclusions of the NATO climate change action plans were as follows:

- Climate change is one of the decisive challenges of our time. It is a threat multiplier that affects the national security of allies, both in the Euro-Atlantic region and in the wider NATO neighbourhood.
- Climate change makes it difficult for armies to carry out their basic tasks professionally and efficiently. Extremely low and high temperatures, rising sea levels, changes in rainfall patterns (fewer days, more intense rainfall), as well as an increase in the frequency and intensity of extreme weather events make individual military facilities and bases significantly vulnerable, so much so that they have already fallen out several times or military objects were destroyed, capabilities were lost, which in total caused a significant strategic situational advantage and a decrease in regional deterrence capability.
- The effects of climate change shape our geopolitical environment and can influence the attitude of the state. The rate of melting of the vast northern icy areas creates a geostrategic competition, which can provoke a series of conflicts, causing increased instability.
- Among the consequences of climate change, drought, soil erosion and the deterioration of the marine environment entail the loss of capacity of productive areas, causing famine, civil discontent, and riots (see Arab Spring). Prolonged drought means the rapid 'burning out' of the natural environment, which, in addition to the basic living conditions, has a destructive effect on the economy. The fundamentally important survival factor is what kind of state system, financing system, and defence mechanism they want to prevent, avert, and eliminate environmental challenges. For example, in the case of hurricanes, wealthier countries may report lower deaths but higher

material damage, while the opposite is true for countries with lower GDPs, as they have higher deaths but lower material losses.
- NATO recognises the effects of climate change and is determined to play an active international role with various measures. One aspect of this is the measurable reduction of greenhouse gas emissions resulting from operations, barracks energy consumption, and organisational operations. Practical solution measures include running onboard electronics with solar energy, providing military fuel consumption from renewable energy sources, etc.

Overall, the main areas of the June 2021 NATO Summit included: Russia's aggressive actions, the threat caused by terrorism, cyber-attacks against NATO allied countries, risks arising from technological innovation and artificial intelligence, security effects of climate change, China is becoming strong of military and economic aspects.

NATO's security challenges

NATO faces many threats today, with climate change being one of them (Gazdag, 2022). From NATO's point of view, the security effects of climate change include:

Climate change is an efficiency enhancer: Climate change is one of the factors shaping the strategic environment. On the one hand, climate change has a negative consequence, which amplifies the effects of current crises, and on the other hand, the change itself can be a crisis (so-called climate crisis), therefore, overall, either of these can create geopolitical tension or aggravate existing ones (URL14). Changed circumstances or unusual situations can cause a shift in the diplomatic balance between states. Examples of this are the deterioration of the material assets necessary for subsistence: less available drinking water, as well as a reduced amount of irrigation water due to drying and prolonged periods of drought, living conditions made difficult by dust storms, direct impact and exposure due to more extreme meteorological events, a decrease in the productivity of agricultural land, etc. Climate change generates resource conflicts, such as:

- The lack of ice of the Northern Passage in an ever-increasing time interval – geostrategic reorganisation – economic-military competition, possession compulsion (Kristian, 2014). With the melting of the arctic ice, the geostrategic competition for a) resources b) maritime routes may intensify (time, energy, and money can be saved with shipping options between Europe, North America, and Asia). The rapid melting due to intense warming means economic opportunities, as there are significant reserves of crude oil

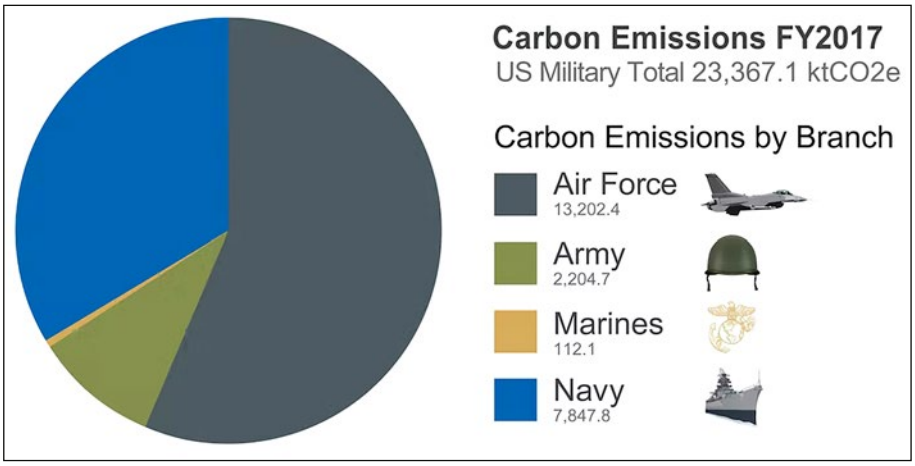
and natural gas in these areas, and they are also rich in mineral resources and excellent from a fishing point of view (Gazdag, 2022). Currently, there is Russian military superiority in and around the North Pole, which is why the great power struggle for the Arctic is intensifying. The significant environmental, economic and geopolitical development of the Arctic is a key problem for NATO (URL15). In this regard, the strengthening of the so-called coordinated deterrence, the scenario of the Far North, was developed, which was adopted in order to strengthen the deterrence and defence position of the military alliance.

- At the 2016 NATO Summit in Warsaw, the real danger of the changes occurring in the North Pole and its sphere of influence were recognised, which clearly affects the relationship between NATO and Russia. NATO stated that Russia's attitude in the Northern territories is threatening, and that it is already treating deployments and mobilizations of military forces as aggressive actions. According to a 2008 Arctic strategy of Russia, the mentioned area is considered a resource base, and they intend to offset the difficulties due to the reduction of gas and oil production capacity in Western Siberia by extracting crude oil and natural gas from the northern areas (including new fields).
- Livelihood difficulties resulting from the deterioration of the environment, which may result in civil discontent, demonstrations, riots, and armed conflicts.
- Accelerating rate of migration. Due to the prevailing drought in the Sahel region, migration to Europe may accelerate. The reason for this is that the region's population growth is strong, the availability of natural resources is inadequate, the governmental institutional system is weak, and there are issues regarding property rights with the people living in the surrounding areas regarding farmland and water resources. Several groups want to secure their livelihood through means of possession, which leads to competition (Hendrix & Glaser, 2007) and can result in conflicts (URL16, URL17). According to the World Bank's 2021 Groundswell report, climate change could force 216 million people to move within and outside their own countries by 2050 (URL18).
- The spread of terrorism and radicalism. Due to the deterioration of the natural and built environment, local communities become vulnerable, and by taking advantage of social discontent, radical organisations are able to win members and encourage them to carry out armed or terrorist acts.

Effects regarding military forces

- Pollutant – greenhouse emitter.
  Armed forces are among the world's largest consumers of fossil fuels (Belcher, Bigger, Neimark, & Kennelly, 2019). An example of this is data from 2019, according to which the carbon footprint of the military sector in the EU is 24.8 million tons of carbon dioxide equivalent. The most energy-consuming are the heating and cooling activities of military infrastructures and buildings, which represent more than a third of total emissions. The heating systems are mainly based on petroleum fuels and natural gas. This is an absolute risk from a military point of view, because it depends on the continuous dynamics of oil and gas extraction, and the supply chain is also built on this process. The elimination of fossil energy carriers is thus also a strategic objective (URL19). For example, most of the fuel needs of a 300-person crew camp is made up of electricity, air conditioning-cooling, and water heating (URL20).

Figure 1: *Carbon dioxide emission of certain weapons of the US military in 2017*



Source: The Conversation, 2021 (URL21).

Figure 1 shows that the US Air Force is by far the largest emitter of greenhouse gases (Belcher et al., 2019), as its CO_2 equivalent of 13,202.4 kilotons (kt) is almost twice the US Navy's CO_2 emissions of 7,847.8 kt. For instance, a Leopard 2 tank consumes 340 litres of diesel per 100 kilometres, and a Eurofighter burns 160 kilograms of kerosene (125 litres of fuel) per minute. According to this, the

air force and the navy are the biggest purchasers of fuel, since, for instance, in 2017 the air force bought fuel worth of 4.9 billion (HUF 1455 MRD), the navy of 2.8 billion (HUF 831 MRD), the land force of 947 million (281 MRD HUF), the marine corps of 36 million (10.6 MRD HUF) dollars (DLA, 2017).

- Suffers the negative consequences of climate change.
  According to the EEAS Climate Change and Defence Roadmap 2022 report, the US armed forces have lost more military assets and infrastructure to the effects of natural disasters than during the armed conflicts in Afghanistan and Iraq combined (URL22).
- Potent participant – can be an active participant in the fight against effects.
  The American government, which is the main 'coordinator' of NATO, (then) US President Donald Trump withdrew from the Paris Agreement, which was created out of an international consensus in favour of sustainability, and then, the current president, Joe Biden, re-signed the said Agreement. Biden administration's position is that armed forces must prepare for changing climate conditions, so that the continued expansion of military capabilities cannot be compromised despite the burdens of climate and meteorological extremes (Biden, 2021). The activities of armed forces must support the carbon dioxide neutrality objectives of the European Union, and a more active role in the fight against the negative effects of climate change is necessary. A guaranteed financial cover is available for this. In this regard, Nyitrai says that armed forces of countries with a poorer GDP still have reservation about this, since a) the currently used fossil energy carriers ensure the energy supply of the operations, b) there is little experience with renewables that proves the continuity of the operations, c) the investments are very expensive, d) there is no adequate financial background for the developments, e) the primary objective is to maintain capacities and abilities with the current equipment systems (Nyitrai, 2018).

Furthermore, it is currently controversial that one of the most polluting armies in the world dictates the climate policy objectives to be achieved by the forces (Nuttall & Samaras, 2017).

Array of connections

In 2021, NATO stated that the military alliance wants to achieve carbon neutrality by 2050, taking into account international emission reduction commitments. With this, the UN and the European Union assumed a significant active role in the fight against the negative effects of climate change, given that China announced its net carbon dioxide emission commitments for 2060 and India

for 2070. It is the task of NATO's leaders, decision-makers, and officials to ensure that the 22 members (2021 declaration) have emission reduction options, practical steps, feasibility schedules and procedures, as well as maintain relations between the member states and building harmony. In this regard, NATO and the EU enter into a closer partnership, within the framework of which the areas of cooperation are complemented by climate change and its security aspects (URL14).

Fighting the negative effects of climate change in 2022

NATO published 'Climate Change and Security Agenda' on 28 June 2022, which is an extremely important milestone in NATO's history. NATO recognises climate change as one of the biggest challenges of our time, whose effects on security are already proven facts. In the Report, NATO describes itself as an active international player, as a so-called flagship in the global fight against the negative effects of climate change, as well as related security and defence issues. This Report is a clear continuation of the action plan on climate change and security adopted in 2021. At the NATO Summit in Madrid in June 2022, it was stated that NATO will reduce carbon dioxide emissions by at least 45% by 2030, and then achieve carbon neutrality by 2050.

Overall, NATO is committed to raising awareness and the propensity to investigate the impact of climate change on security, to develop adaptation and mitigation measures, and to continuously inform about the current results, so that the quality of the performance of tasks arising from its original purpose cannot deteriorate, it must remain credible in its deterrence and defence attitude, military capabilities must be developed at an increased rate, taking operational efficiency and cost-effectiveness into account. From 2022, NATO has become the military alliance that responds to other climate protection obligations in addition to the security effects of climate change. It can be stated that the security content of climate change has become one of the permanent topics of NATO summits.

Summary, conclusions, results

NATO is a necessary result of the power and military threat after the Second World War. In the beginning, military and nuclear war issues were given priority, but the lessons learned from the occurrence of various disasters – especially when a NATO member state was involved – and the wide-ranging scientific

and research publicist momentum of international environmental protection and human-ecological world problems reached NATO's activities as well. Initially, in connection with various pollution and waste issues, and then with the theoretical disintegration of the bipolar order, NATO is taking an increasingly active role in issues of sustainability and climate protection.

Several noteworthy plans, reports, declarations, and publications indicated NATO's increasing commitment to climate protection, but in the opinion of the authors, the breakthrough success occurred when a) the current NATO Secretary General became the number one leader (climate-proof past), b) a climate action plan was created in 2021, and the Climate Change and Security Agenda was adopted and announced at the NATO Summit in Madrid in 2022.

NATO recognises that it faces many environmental challenges, particularly the risks posed by climate change (URL23). During various disasters, NATO provides assistance through the Euro-Atlantic Disaster Response Coordination Centre[10] with the help of the Euro-Atlantic Disaster Response Unit[11] in terms of tasks related to prevention and emergency responses. An important objective was to increase energy efficiency and reduce the carbon footprint of armed forces.

Although it can be stated that NATO is not the first responder to the challenges related to climate change, the military alliance has a significant role in the fight against the negative effects of climate change. In addition to NATO's most important basic tasks – collective defence, crisis management and cooperative security – NATO has become an international player in global mitigation and adaptation objectives. In recent years, NATO Allies have increased their ambitions and taken specific steps at national and global level through coordinated efforts in the context of the United Nations and the European Union on the way to the realisation of the sustainability objectives.

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10 EADRCC: Euro-Atlantic Disaster Response Coordination Centre (NATO).
11 EADRU: Euro-Atlantic Disaster Response Unit (NATO).

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