

The Impact of Global Climate Change on National Security

BY

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Abstract

We live in the warmest period in the last 150 years. The climate on Earth has changed many times. The causes of these climate changes varied. Most scientists agree that the major part of today's global warming has been caused by mankind. Excessive pollution, uncontrolled seizure and exploitation of natural resources and a drastic increase of population can by no means pass unnoticed. It is expected that the consequences of climate change will severely interfere with the most fundamental living conditions of people worldwide. The accessibility of water and food may be aggravated and the problems of the basic living space may turn up. Climate change might be causing different crises: political, economic, energy, migration, social, health, and epidemiological as well as others. In extreme cases, climate change may also trigger military interventions.

Most countries worldwide identify climate change as a global source of threat that might put many countries and societies worldwide in grave danger. To reduce the human impact on the environment, countries around the world have signed or ratified various international instruments and have defined climate change in their national legislation as a serious threat to the safety of national security.

Keywords: *Climate change; National security; International safety; Greenhouse gases; Carbon dioxide.*

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Introduction

The consequences of climate change are expected to severely affect the most basic living conditions of people around the world very soon. The availability of food and water may be exacerbated. Basic habitat problems may emerge. The biggest problems are expected in the countries most affected by climate change. These countries could face increasing shortages of the basic resources needed for human survival.

Lack of basic livelihoods could lead to various crises: political, economic, energy, migratory, social, health-epidemiological, and others, which could escalate into conflicts and ultimately even armed conflicts. Expected climate change is therefore a typical source of non-military threats, which may turn into military threats. Climate change can be expected to threaten the national security of individual countries in the future.

Most countries recognize climate change as a global threat that could severely undermine countries and societies around the world. Countries agree that climate change needs to be tackled at a global level. Countries have signed or ratified

various international instruments to reduce the human impact on the environment. Many countries define climate change as a global threat in their national legislation.

Slovenia is a signatory to international instruments on reducing human impact on the environment. In its Resolution on the National Security Strategy, Slovenia identified climate change as a global source of threat and risk to national security.

The Slovenian Armed Forces are one of the pillars of national security and must therefore pay particular attention to the expected climate change.

Climate change in the past

Different sciences and studies show that our planet's climate has changed many times in the past. Advances in science have made it possible to trace climate data back a long way (Kajfež Bogataj 2006, 4). Palaeoclimatic¹ research shows

¹ *Paleoclimatology - the science that deals with climate in the past.*

that rapid and abrupt climate change has occurred throughout history. By measuring different ice layers, scientists show that the average annual air temperature on Earth rose dramatically around 12,000 years ago. The high rise in temperatures caused glaciers to melt and a huge amount of water to flow into the oceans, changing the circulation of ocean water. As a result, a very cold and dry period set in. The climatic conditions during this period were similar to those of the Ice Age. The Pentagon report, which warns of the possibility of new abrupt climate changes, is based on studies from this period and possible analogies with today's warming. As temperatures rose, agriculture and pre-antique civilizations began to develop around 8000 years ago. This period was followed by the warm medieval period when the Vikings colonized Iceland and later Greenland. There are no records of severe winters in Slovenia at this time (Kajfež Bogataj 2007, 6). In our mountainous world, several mountain farms are said to have been established and later abandoned (Ogrin 2005, 61). The Medieval Warm Period was followed by a period of marked climatic instability in Europe. Floods, droughts, and harsh and mild winters alternated. In the 13th and early 14th centuries, sea floods in north-western Europe claimed between one hundred and four hundred thousand lives. It was one of the greatest weather disasters in human history. Such large floods are thought to be the result of rising global sea levels, due to the warm medieval period, and increased storm frequency due to the cooling of the Arctic. (Ogrin 2005: 61). Viking settlements in Iceland and Greenland disappeared. Cereal production was abandoned in northern Europe and Denmark. There were severe food shortages. One of the worst famines in human history occurred. The drastic deterioration in living conditions led to outbreaks of disease in humans, animals, and plants, and consequent social unrest. The Black Plague, or Black Death,² appeared throughout Europe and the world, killing a third of Europe's population at the time (Aberth 2016, 2-5).

Europe then experienced a period of the Little Ice Ages, which peaked between 1550 and 1700 (Aberth 2016, 2-5).

² *The Black Death refers to an epidemic of alleged pneumonic plague that occurred throughout Europe in the 14th century. Before the outbreak of the Black Death, Europe suffered from a great famine. This is probably one of the reasons why the epidemic killed a third of the population of Europe at the time, around 25 million people. Many believed that the plague was some kind of divine punishment for humanity, and religious fanaticism arose across Europe. Nevertheless, the overall power of the Catholic Church declined as a result of the plague, as people lost confidence in it. Thus, the plague precipitated social and societal changes in later centuries. Farmers were allowed to have more land as many of them died and their conditions improved (Source: <https://www.britannica.com/print/article/67758> 12.2.2023).*

The Little Ice Ages were then followed by the Great Ice Age. Alpine glaciers descended to their lowest point after the last glaciation and remained there until the end of the 19th century. Snowfall increased and winters were extremely harsh. In the Alps, people were in fear of the advancing glaciers, which covered many villages, farms, and pastures. The Little Ice Age was not a uniformly cold period. There were also major climatic fluctuations. Summer heat waves and mild winters have been observed. In 1665, the last plague broke out in England during a hot summer. Europe also experienced severe droughts during this period (Ogrin 2005, 61).

Temperature changes had a major impact on agriculture and, as a consequence, on the migration of European populations to North America (Kajfež Bogataj 2007, 6). After 1700, climatic conditions improved. The atmosphere warmed. The trend towards warm summers continued until the end of the 18th century, but the 19th century was again somewhat cooler.

The 20th century was the warmest century on record, and the last decade of this century was the warmest in the last 1000 years (Ogrin 2005, 61). The rate of global temperature increase is remarkable compared to temperature changes throughout Earth's history.

Causes of Climate change

We are living in the warmest period in 150 years. It has been one of the warmest years on record. Summers are becoming increasingly dry, cold and snowy winters are becoming rarer, and extreme weather events more frequent (Kajfež Bogataj 2008, 14).

The Earth's climate has changed many times. The Earth has experienced both cooler and warmer periods over the last three million years. The causes of climate change have been varied: the movement of the Earth has changed, as has the radiation and movement of the Sun. Historical changes include changes in land and sea surface, the formation of mountain ranges, changes in vegetation, and land covered by snow and ice (Kajfež Bogataj 2008, 14). On Earth, the average atmospheric temperature has increased by $0.6\text{ }^{\circ}\text{C} \pm 0.2\text{ }^{\circ}\text{C}$ over the last 20th century. Most scientists believe that humans are responsible for most of the warming over the last 50 years (Murray 2007, 10).

There are two different views on the cause of the high increase in atmospheric temperature in recent years. Scientists belonging to the Intergovernmental Panel on Climate Change (IPCC)³ believe that humans are largely to blame for the

³ (IPCC) *The Intergovernmental Panel on Climate Change (IPCC) was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organisation (WMO). The IPCC is based in Geneva. It is a scientific body. The IPCC's primary task is to provide messages to the world on understanding climate change. The IPCC has 194 member countries. The IPCC member from Slovenia is Dr Lučka Bogataj Kajfež, a Slovenian*

recent high-temperature increase. According to the IPCC, humans are responsible for 35% more carbon dioxide (CO₂) accumulating in the atmosphere than before the Industrial Revolution. Carbon dioxide levels are projected to double between 2040 and 2060 if human attitudes toward the Earth do not change (Kajfež Bogataj 2008, 14).

According to the IPCC, global temperatures are expected to rise by 1.4 to 5.8 °C between 1990 and 2100 (Murray 2007: 10). The rise in global temperature will depend mainly on the behavior of humanity as a whole. Scientists warn that such temperature increases pose a serious threat to our planet. If action is not taken in time, the world will face increasing consequences from global warming.

On the other hand, there is another view on the cause of global warming. A group of 30 scientists⁴ from 16 different countries attribute global warming exclusively to natural causes (Tomovič 2008). In their report, they show that the human factor does not influence global warming and climate change. Climate change is not supposed to be caused by human actions, but only by natural cycles. They show that the climate has changed in the past, without human influence. The alternation of warm periods and ice ages on Earth is normal for them. According to them, there have been 17 ice ages on Earth in the last two and a half million years, with warmer periods in between. The team of scientists says: "Our planet has gone through cold and warm periods in its history that are beyond the control of mankind. We are in a warm period, waiting for the next ice age." They argue that the increase in carbon dioxide (CO₂) should not affect global warming. Any effort to reduce greenhouse gases in the atmosphere is pointless. In their view, such measures only cost a lot of money and are completely ineffective (Tomovič 2008). Professor S. Fred Singer, a lecturer in environmental science at the University of Virginia and a member of the NGO Committee on Climate Change, is convinced that there is cyclical warming and cooling of the atmosphere. He believes that it all depends on the solar cycle, which is unfortunately unknown today.

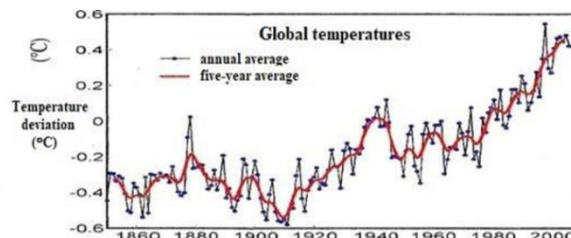
Regardless of the different views on the causes of global warming, it is well established that the Earth's atmosphere is

climatologist and co-winner of the Nobel Peace Prize. Scientists serve on the IPCC voluntarily. The IPCC produces and publishes a report at intervals of up to six years. So far, four reports have been issued. The first report was issued in 1990. This report was decisive for the adoption of the UN Framework Convention on Climate Change at the 1992 World Summit in Rio de Janeiro. The fourth and most recent report on climate change was issued in 2007. A fifth report will be issued in 2013/2014. All the reports produced state the facts that the human impact on climate change is undeniable. (Source: <http://www.ipcc.ch/> 11.11.2023).

⁴ A team of 30 scientists from 16 different countries attributes global warming solely to natural causes. They set up the NGO Committee on Climate Change and published a highly publicized report entitled "Nature, not human actions, rules the planet" (Source: Tomovich 2008).

warming. Man's irresponsible behavior is contributing to global warming. Man's influence or culpability in the warming of the planet is at least five times greater than natural changes, such as the action of the Sun (Kajfež Bogataj 2008).

Figure 1. Global temperature rise (annual and 5-year averages)



Excessive pollution⁵, the uncontrolled exploitation of resources, and the drastic increase in the Earth's population are certainly not without consequences. There are 6 times more people on Earth today than in 1800. On average, each person on Earth uses 7 times more energy today than 200 years ago. Humans are changing the composition of the atmosphere at an accelerating rate, and with it the characteristics of the Earth's surface, through land-use change and deforestation.

The burning of fossil fuels, traffic, fertilization, rubbish dumps, factory emissions, and so on are leading to more and more greenhouse gases (GHGs: CO₂, CH₄, O₃, etc.) and aerosols - microscopic floating particles and droplets - in the atmosphere (Kajfež Bogataj 2006, 4).

Globalization and the development of the world today rely on cheap fossil energy systems. The world economy is based on capital and neoliberalism. The result is the exploitation of ecosystems, of natural resources, which is further fuelled by the dictates of continued economic power. Economic growth is based on the integration of more and more people into the global economy and increasing consumption. Consumerism has so far been confined to the developed part of the world. One billion people from developed countries have been drawn into the consumer vortex, joined now by at least five billion people from poor emerging countries, notably China and India (Kajfež Bogataj 2008).

⁵ Bogataj Kajfež: "Every hour, 10,000 people join the global population. Every hour, 1.7 million kg of nitrogen is added to the fields. Every hour we cut down 1 500 hectares of forests. Every hour we send 4 million tonnes of carbon dioxide into the air, every hour 3 animal species die out. 24 million plastic bottles dumped in landfills (in one hour), 18 000 mobile phones thrown away (in one hour), 13 million cans thrown away (in one hour), 44 million plastic bags thrown away (in one hour)" (Source: www.svps.gov.si/fileadmin/svps.gov.si/.../Posveti_O

UDU_Kajfez.ppt, 19.11.2023).

If we are to survive as humanity, we must very soon significantly reduce pressures on the environment and start to respect the planet's limits (Umanotera 2009).

The fact is that humans are changing the environment through their actions and uncontrolled interventions to such an extent that very soon even the existence of the planet could be threatened. The basic natural resources that are essential for human survival may be one of the causes of future conflicts or even armed conflicts (Fritz 2011, 74).

Impacts of Climate change on National Security

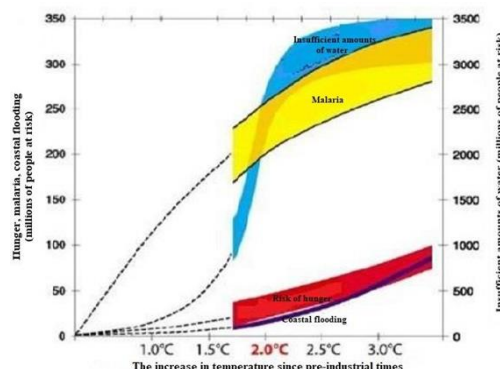
The scientific evidence is irrefutable. Climate change is a serious threat to the world (Murray 2007: 40). The consequences of climate change in the future could threaten both individual security and the security of the international community as a whole (Vrtnik 2003: 63). They pose a major challenge to the existence of humans and species. They will affect people irrespective of nationality, religion, and race. The impacts will be different in different parts of the world. The effects of climate change are expected to exacerbate the current inequality between rich and poor countries (Noack, Campioni 2008, 6).

In 2003, a Pentagon report was published, officially presenting climate change as a national security threat for the first time. Public interest in the report was high, both in the US and worldwide (Kajfež Bogataj 2008, 152).

The 2006 report by the British economist Nicholas Stern also generated a lot of interest. The report was the first to make public the fact that climate change poses a major threat to the global economy as a whole (Kajfež Bogataj 2008, 152). The Stern Review stresses that climate change has the potential to affect the necessities of life for people around the world in the very short term. Hundreds of millions of people could be affected by water and food shortages as a result of global warming. If left unchecked, the cost of climate change risks could be as high as 5 percent of global GDP, and the damage could be as high as 20 percent of GDP or even more. The Stern Review mentions that countries should allocate a percentage of global GDP to limit warming (Murry 2007, 40).

The IPCC estimates that the cost of limiting warming to a still acceptable range of 2 to 2.4 0C per year would be around 0.12 percent of global GDP (Kajfež Bogataj 2009, 10). "By the end of the century, the rise in global temperature will depend on the behavior of humanity as a whole. At best, it will be by a meager 2 0C (relative to today), but if we continue to increase greenhouse gas emissions, the average will be as much as +4 0C, with an upper limit of 6.3 0C. If the rise in the average temperature of the planet exceeds 2 0C compared to pre-industrial times (we have already exceeded 1 0C), the various risks (famine, coastal flooding, water scarcity, malaria, etc.) will increase exponentially" (Kajfež Bogataj 2008) (Table 1).

Table 1. Increase in population at risk with temperature increase



(Kajfež 2008, 3)

Climate change could be the trigger for a variety of crises: political, economic, energy, migration, social, health, epidemiological, and others. If left unmanaged, crises can escalate into conflicts and ultimately into armed conflict. Climate change must be seen as a non-military threat, but it can also become a military threat (Kajfež Bogataj 2006, 3).

Impacts of Climate Change on Food Security

In many parts of the world, long dry spells and increased flooding are reducing the area under cultivation. Increased declines in agricultural production can lead to severe food insecurity and, as a consequence, drastic increases in global food prices (European Commission 2008, 3).

In Slovenia, climate change could also affect food, agriculture, and livestock farming. Plants will also have to adapt to the expected rise in temperatures and extreme weather events. Ecosystems that do not have the potential to move to a new location will be particularly at risk. It is expected that an increasing number of diseases and pests will emerge in plants, mainly due to a decrease in plant resistance. In Slovenia, some plant and animal species are already threatened. Climate change could only worsen the situation (Kajfež Bogataj 2006, 174). The consequences of climate change will not only have an impact on agriculture but will also have a significant impact on livestock farming. Changes are expected in pastures and grazing, livestock health, and nutrition (Kajfež Bogataj 2006, 33).

As a result, climate change could also have an impact on food insecurity in Slovenia, which could lead to a large increase in food prices, especially as Slovenia is not a self-sufficient country. In 2010, Slovenia was self-sufficient in vegetables (31%), cereals (55%), potatoes (63.2%), pork (53%), and poultry (over 100%) (Statistical Office of the Republic of Slovenia 2011).

Impacts of Climate Change on Water Resources and Water supply

Climate change is expected to change precipitation patterns. In some areas of the world, the amount of available drinking water is expected to decrease by 20 to 30 percent. Water scarcity could lead to civil unrest and significant losses even in robust economies (European Commission 2008: 3). Countries that want food, water, and energy security will struggle to manage dwindling resources and to protect access to them (Steiner 2009, 2).

"Slovenia is rich in water resources and ranks among the most water-rich countries in Europe, with a per capita water consumption almost four times higher than the European average. In 2009, 81 m³ of water was provided in Slovenia and 60 m³ per capita was used. More than half of this water was consumed by households, at an average of 42 m³ per household member" (Statistical Office of the Republic of Slovenia 2011).

Although Slovenia is rich in water resources, it is expected that climate change will also affect water resources in Slovenia. Water supply problems are expected to arise due to the drop in groundwater levels, especially during extreme drought periods. Agriculture and the energy sector will be most affected by water shortages. Water supply shortages will result in more expensive water and electricity. Migration from neighboring countries, which will be most affected by water scarcity, cannot be ruled out (Kajfež Bogataj 2006, 174). Sea level rise is already a serious threat to the one-third of the world's population living in coastal areas. From an economic point of view, rising sea levels could mean the collapse of coastal fisheries, tourism, and vital agricultural areas.

Damage to the most important ports could affect international trade and cause the crisis to spread across borders (Steiner 2009, 2). Large cities often have their supporting infrastructure (ports, refineries, etc.) located by the sea or river deltas. Rising sea levels would seriously threaten these areas and their economic prospects. This could lead to the disappearance of territories and even countries as the coastline moves landwards. Island countries are particularly at risk (European Commission 2008, 4). In Slovenia, coastal towns could be affected by sea-level rise. Ports, marinas, tourism, fisheries, and low-lying agricultural areas could be affected.

Impacts of Climate Change on Energy

Climate change will have an impact on global energy markets. Energy will become increasingly expensive and harder to access. The biggest impact will be on fossil fuels: coal and oil (Kajfež Bogataj 2006, 174). The price of fossil fuels will increase dramatically due to increased demand, limited supplies, climate change, and political instability in oil-producing regions. Oil consumption is projected to increase by 60% by 2025. This large increase in oil consumption is due to industrialization in some less developed countries (China, India) and to the increase in transport in developed countries in particular. If oil consumption continues to increase at this rate, there will only be enough oil for another 40 to 50 years. "Sooner or later, the price of oil will also be affected by restrictions on fossil fuel consumption due to climate change. Permits will have to be bought to increase the consumption of

fossil fuels, including oil. Permits will be issued by countries or groups of countries (e.g. the EU) based on negotiated quotas allowed under the Kyoto (and possible future) agreement to reduce greenhouse gas emissions" (Kajfež Bogataj 2007, 50-51).

The most important energy sources in Slovenia are oil, gas, coal, hydropower, and nuclear energy. In Slovenia, alternative energy sources are less important: solar, biomass, wind, and geothermal (Tušar 2007, 39).

Slovenia's energy dependence remained relatively low at 48% in 2010. Slovenia's domestic energy sources include domestic coal, electricity generated by nuclear power plants and hydroelectric power plants, and renewable energy sources (biomass, biogas, waste). These sources provide 52% of Slovenia's energy needs. Slovenia depends on imports for the remaining energy sources, such as higher calorific value coal, petroleum products, and natural gas.

The shares of electricity produced from renewable sources in Slovenia were as follows: 95% of electricity was produced from hydroelectric power plants, a good 2% from wood and wood residues, 1% from biogas, and 2% from other sources (landfill gas, photovoltaics, sewage treatment plant gas, and industrial waste) (Statistical Office of the Republic of Slovenia 2011).

Oil is the most important of all energy sources in Slovenia in terms of national security (Kajfež Bogataj et al. 2006: 51). A shortage of oil or a drastic increase in its price would have very significant consequences for our country. Climate change would also have a major impact on renewable energy sources: solar, wind, hydro, and biomass (Kajfež Bogataj 2006, 174).

Climate change is expected to increase electricity consumption for space cooling, especially at extremely high temperatures. More frequent weather extremes (floods, storms, wind, hail) could cause significant damage to the electricity distribution network. Increased energy consumption during heat waves and more frequent breakdowns could increase the likelihood of power system collapse (Kajfež Bogataj 2007, 59). Increased demand and reduced supply could lead to a large increase in electricity prices, with major consequences for the country.

Impacts of Climate Change on Health

The consequences of climate change would have a major impact on human health and well-being. The impact of consequences of a changing climate can be positive, but most of the time they are negative for health. So far in Slovenia, the impacts of climate on human health have been heat waves, shortages of drinking water in certain areas, and tick-borne diseases (Kajfež Bogataj 2008, 15).

In the coming years, we can expect that the depletion of the stratospheric ozone layer will lead to an increase in UV radiation intensity, which could have serious consequences for the health of the population, both globally and in Slovenia. Climate change would certainly contribute to the spread of serious infectious diseases that could affect not only human

health but also the health of plants and animals. There could be an increase in certain species of animals (rats, ticks, mosquitoes, wasps, and other insects, etc.) that currently live in balance and do not pose a significant threat to humans. The survival and reproduction of many bacteria and viruses also depend on the temperature and humidity of the environment. Changes in climate could have the effect of increasing the resistance of certain types of bacteria and viruses to certain existing drugs. This is an issue that is already being faced in the healthcare sector and may become more acute in the future. The disruption of the biological harmony of ecosystems may give rise to new species of bacteria and viruses without natural enemies. This could have catastrophic consequences (Kajfež Bogataj 2007, 41-43). Nor can we ignore the fact that climate change could lead to increased migration from areas that will be severely affected by climate change. Migrants could bring new infectious diseases.

The Impact of Climate Change on Migration

By 2050, 50 to 350 million people worldwide will have to leave their homes due to flooded areas, lack of basic resources (food, water), and the escalation of natural disasters such as storms, floods, or droughts. They will have to move without the possibility of return or rebuilding. If sea levels rise by one meter, many island countries will disappear (Steiner 2009, 2).

Groups of people already suffering from poor health, unemployment, and social exclusion will be even more exposed to the impacts of climate change. This could increase migration within and between countries. Such migration could lead to further conflict. Europe is also expected to be subject to increased migratory pressures (European Commission 2008, 4).

Refugees could, however, lead to political tensions between countries or even to new hotbeds of war. Slovenia could also face increased migratory pressures, especially from neighboring countries, which would be particularly affected by shortages of livelihoods, especially food and water (Kajfež Bogataj 2007, 4).

Climate Change and Extreme Weather Events

Extreme weather events (droughts, heat waves, floods, water storms) have huge economic and social impacts. Infrastructure (buildings, energy, water supply) is affected. Densely populated areas are particularly vulnerable (Commission of the European Communities 2009, 4). Natural disasters have claimed more than two million lives worldwide in the last twenty years. They affect more than 200 million people a year. They cause extremely high levels of damage (Steiner 2009, 2).

Climate change will also affect the frequency of extreme weather events in Slovenia. The decreasing stability of the atmosphere will change the intensity and frequency of storms, and more damage is expected from torrential rain, lightning, hail, and strong winds. Flash floods and landslides will become more frequent. The extent of water-stressed areas will increase in summer, as will the number of dry days. Hurricane

winds cannot be ruled out (Kajfež Bogataj 2006, 174). Floods can claim many human and animal lives and cause extensive damage to the environment, infrastructure, and property. They can destroy crops and contaminate drinking water, which can lead to outbreaks of various diseases (Kajfež Bogataj 2007, 61). Increasing droughts and heat waves can have disastrous consequences not only for agriculture but also for people's lives, especially in large cities. Vulnerable categories of the population are most vulnerable to heat (Kajfež Bogataj 2007, 4).

From the above, we can conclude that climate change can be considered as a factor that could give rise to various crises. Crises could give rise to various conflicts. If left unchecked, conflicts can escalate into armed conflicts. Climate change is therefore a threat to national security. It must be seen as a source of non-military threat, which can develop into a military source of threat (Kajfež Bogataj 2007, 3).

Countries' Response to Climate Change

The International Community's Response to Climate Change

Countries agree that climate change is a global issue and that it is essential to tackle climate change at a global level. The United Nations (UN) Conference held in Stockholm in 1972 marked the beginning of the global debate. This conference represented something of a milestone in history. After the Stockholm Conference, it became clear that man's interventions in the environment were responsible for global environmental change (Vrtnik 2003, 58).

The World Meteorological Organisation subsequently launched scientific research and an approach to raise public and political awareness of the importance of climate change. This resulted in the establishment of the Intergovernmental Panel on Climate Change (IPCC) in 1988 (Jesenko 2010).

The first major international effort by individual countries to reduce the human impact on the environment is the signing of the United Nations Framework Convention on Climate Change. It was signed in 1992 in Rio de Janeiro, Brazil. The United Nations Framework Convention on Climate Change (UNFCCC) entered into force in 1994. It has been ratified by 189 countries (United Nations Information Service 2007).

The Framework Convention points out that humans are the main culprits in warming the Earth's surface and the atmosphere, mainly through the release of large amounts of greenhouse gases into the atmosphere. The main objective of the Framework Convention was to stabilize greenhouse gases in the atmosphere. By signing the Framework Convention, countries undertook to reduce emissions of carbon dioxide and other greenhouse gases to 1990 levels by the year 2000. The Convention placed the key responsibility for combating climate change on developed countries (Vrtnik 2003, 59). The Convention required industrialized countries to keep accurate and regular inventories of their greenhouse gas emissions. Given that the Convention was only a kind of 'framework document', the signatory countries felt that it was necessary to add an agreement (protocol) to the Convention that would

have more stringent requirements to reduce greenhouse gas emissions. The Kyoto Protocol was thus adopted in Kyoto, Japan, in 1997 and entered into force on 16 February 2005 (United Nations Information Service 2007).

The Kyoto Agreement has been ratified by 191 governments and authorized governmental bodies by 2024.⁶ India and China have ratified the agreement, but have not been obliged to reduce carbon emissions under the deal (Murray 2007, 38). The US was a signatory to the Protocol but has not ratified it. The Protocol foresees a reduction of carbon dioxide and other greenhouse gases in the atmosphere in developed countries by 5 percent over the period 2008 - 2012 to a 1990 baseline. The Kyoto Protocol requires the EU's fifteen members to reduce their greenhouse gas emissions by 8 percent by 2012, with rules for new members to be determined on an individual basis (Tušar 2007, 41). In addition to reducing carbon dioxide and other greenhouse gases, the Protocol provides for emissions trading, the promotion of renewable energy sources, a switch to lower carbon fuels, more environmentally friendly waste management, better use of fertilizers, among others (Delo 2005). During Slovenia's EU Presidency, the Energy and Climate Package was adopted, which foresees a 20 % reduction in greenhouse gas emissions to the atmosphere by 2020, for the EU as a whole.

To reduce emissions of carbon dioxide and other greenhouse gases, Slovenia also signed the Kyoto Protocol in 1998 and ratified it in 2002. By signing it, Slovenia committed to reduce its greenhouse gas emissions by 8% over the period from 2008 to 2011, compared to a baseline of 1986 (Delo 2005), and by 20% by 2020. The second report on the implementation of the Operational Programme for the Reduction of Greenhouse Gas Emissions (OP TGP-1) shows that assuming intensive implementation of OP TGP-1, Slovenia will be able to meet the Kyoto Protocol target of an 8% reduction in greenhouse gas emissions in 2012 (Government Office for Climate Change 2011).

The world is questioning the environmental significance of the Kyoto Protocol. Its objectives are seen as virtually unattainable without the cooperation of the United States and the emerging economies (India, China, and South East Asia). Major emerging economies such as India, China, and South East Asia are reluctant to join the Protocol because it is too restrictive. Without China and India, the Protocol is ineffective. Skeptics believe that the Protocol should be upgraded with the simple principle of limiting births or population growth. This would achieve the same objective much more easily. According to the skeptics, the planet's one-

⁶ (UNCC) *The United Nations Climate Change Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol) was adopted at the third session of the Conference of the Parties in Kyoto, Japan, on 11 December 1997. Article 24, was open for signature from 16 March 1998 to 15 March 1999 at United Nations Headquarters in New York. (Source: <https://unfccc.int/process/the-kyoto-protocol/status-of-ratification> 11.1.2024).*

and-a-half million head of cattle produces about 25 times more greenhouse gases than all the cars. They believe that humanity produces 5 times more carbon dioxide by breathing than all cars. The only solution, the skeptics see, is to drastically reduce the world's population, through regulation at the international level (Kyoto Protocol 2024).

The fact is that China India and other developing countries were exempted from the Kyoto Protocol because they were not major players in greenhouse gas pollution at the time of industrialization. Critics of the Kyoto Protocol show that it is China, India, and other developing countries that will soon be the biggest greenhouse gas polluters. This will be particularly influenced by the relocation of industry from developed countries to countries where there are no restrictions. The Kyoto Agreement must apply to all or greenhouse gases will not be reduced (Murray 2007, 38).

At the end of 2011, the Conference of the Parties to the UN Framework Convention on Climate Change took place in Durban, South Africa. The focus of the first days of the conference was Canada's withdrawal from the Kyoto Protocol (Diary 2011). Despite ratifying the Kyoto Agreement and committing to reduce its greenhouse gas emissions by 6 percent by 2012 compared to 1990 levels, Canada increased its emissions by 20 percent. By withdrawing, the country avoided penalties for non-compliance with the agreement (Štros 2011). Its behavior was expected. Canada has the third largest oil reserves in the world. Oil production from tar sands, which is 1.5 million barrels per day, is expected to increase to 3.7 million barrels per day by 2025 (Siol 2012).

The Durban negotiations ended the same way they started. Countries agreed to continue with the Kyoto Protocol. The Kyoto Protocol will therefore live on beyond 2012. However, it will not contain legally binding greenhouse gas reduction targets until 2020 (Štros 2011).

Climate change is therefore a global problem. Without industrialized and developing countries working together, climate change and the resulting global warming will be impossible to tackle. Countries will have to put aside their national parochial interests and represent the interests of the environment. New solutions will have to be found that are acceptable to both developed and developing countries (Vrtnik 2003, 62).

The fact is that 2010 was a record year for greenhouse gas emissions. Politicians need to realize that there is no time for delay. People around the world are aware of the dangers of climate change and therefore expect and demand action from politicians. We cannot allow 1% of powerful corporations to decide the fate of 99% of people around the world. Climate change must not become as intractable a problem as global poverty (Štros 2011).

Politicians often use the saying when they want to emphasize unity among people: 'We are all in the same boat' or 'We are all in the same boat' (Prebac 2011).

Speaking at the Talks on Slovenia's Future, Gantar said, "It is clear that climate change is a global phenomenon and a

problem that no society can avoid. The societies that are least likely to be affected by climate change are those that contribute the most and have the most financial, technological, and organizational resources at their disposal to respond to the consequences of climate change. Talk of one ship and the common fate of humanity on that ship is more a pretext than a reality. Global society is distributed differently on the decks and below decks, and lifeboats are not equally available to all" (IKS 2005). The fact is that the process of global warming will not stop without radical changes in global society, especially in its values (Kajfež Bogataj 2008).

Country responses to climate change

Developed countries in particular now consider the environment and threats to the environment as an important element of national security. The United States of America (USA), in its 2010 National Security Strategy, assesses climate change as a threat to regions around the world. It threatens both the security and health of populations (Fritz 2011, 75; US National Security Strategy 2010, 8).

In its strategy, the US estimates that climate change will lead to new conflicts shortly, mainly as a result of competition for natural resources and population migration. Natural disasters are expected to have an impact on environmental degradation worldwide. The US is planning a series of measures to mitigate the effects of climate change. In particular, it plans to invest in renewable energy sources and reconsider its position on the use of nuclear energy. It plans to reduce greenhouse gases by 80 % by 2050. Internationally, it will work to reduce greenhouse gas emissions and to bring all countries together to tackle climate change (Fritz 2011, 75; US National Security Strategy 2010, 47).

In its 2008 National Security Strategy, the United Kingdom (UK) identifies climate change as one of the key threats to national security (Fritz 2011, 75, The National Security Strategy of the UK 2008, 3). Rising global temperatures, melting ice, and the consequent rise in sea levels are thought to increase the potential for disputes over territories around the world. Extreme weather events such as droughts, floods, and storms are predicted to cause humanitarian crises and increase conflict at local, national, and international levels. Extreme weather events will have an impact on water resources (Fritz 2011, 75, The National Security Strategy of the UK 2008, 18). The UK will tackle climate change primarily by reducing greenhouse gas emissions and increasing the use of renewable energy sources. Internationally, they will work to tackle climate change (Fritz 2011, 75; The National Security Strategy of the UK 2008, 50).

In its 2009 National Security Strategy, the Republic of Serbia lists threats to national security as over-exploitation of forests, uncontrolled use and exploitation of energy resources, arable land, drinking water, pollution of air, water, and land, and uncontrolled waste disposal. Climate change has a consequent warming effect. Global warming has negative impacts on ecosystems. All this affects agricultural production and, consequently, the economic stability of the country. Climate change consequently affects overall security (Fritz 2011, 76,

National Security Strategy of the Republic of Serbia 2009, 11-12). The Republic of Serbia will combat climate change through the planned use of natural resources and ensuring compliance with international standards and conventions on environmental protection (Fritz 2011, 76; National Security Strategy of the Republic of Serbia 2009, 26-27).

In 2010, Slovenia adopted the Resolution on the National Security Strategy. Chapter 4 of the Resolution identifies climate change as a global source of threats and risks to Slovenia's national security. It is stated that the rise in air temperature, altered precipitation patterns, rising sea levels, and more intense extreme weather events in Slovenia are expected to exacerbate the scarcity of vital resources, such as food and water, and increase the frequency and intensity of natural disasters in the form of floods, droughts, water storms and the like. The various environmental and weather phenomena could result in significant economic and material damage. The Resolution stresses that the consequences of climate change in Slovenia may take the form of political, economic, and energy crises, as well as migratory, social, health-epidemiological, and other threats and risks, including the possibility of new conflicts (Official Gazette of the Republic of Slovenia 2010).

In its resolution on the National Security Strategy, Slovenia stated that it would work within the framework of the United Nations and the European Union to conclude a global agreement on mitigation and adaptation to climate change to halt the rise in the Earth's average temperature. The resolution states that Slovenia will strive to achieve international standards in reducing environmentally damaging emissions and will assist developing countries in adapting to climate change. In the short term, Slovenia should give priority to upgrading early warning systems for extreme weather events (Official Gazette of the Republic of Slovenia 2010).

It can be concluded that individual countries recognize climate change as a global threat and consider climate change as a threat to national security. At the same time, countries are working to prevent or mitigate the effects of climate change.

The response of the Ministry of Defense of the Republic of Slovenia and the Slovenian Armed Forces to Climate Change

The Ministry of Defence of the Republic of Slovenia (MoDoS) and the Slovenian Armed Forces (SAF) are aware of the impact of climate change on national security. On the one hand, the MoD and the SAF are focusing on reducing the human impact on the environment, and on the other hand on protection and rescue in the event of natural and other disasters. In 2010, the Ministry of Defence (MoD) issued a guidance document on reducing the human impact on the environment. The guidelines issued certain recommended actions such as rational use of products and services, reduction of water and electricity consumption, reduction of emissions from transport, reduction of waste, and prevention of pollution. The document foresaw the establishment of a working (project) group within the MoEW, whose task would

be to analyze the situation and monitor the measures implemented (MoEW 2010). Unfortunately, the working group has not been fully operationalized at the MoEW.

In 2011, the Slovenian Armed Forces issued an order on the rational use of resources in the SAF. Among other things, the order also specifies measures contributing to the reduction of the negative impact on the environment. According to the order, all SAF units are obliged to monitor the measures and report on their implementation every month (GŠSV 2011). Thus, measures to reduce the negative impact on the environment are regularly monitored and analyzed in the Slovenian Armed Forces. Among other things, the following are regularly monitored: greenhouse gas emissions (CO₂, CH₄, SO₂, CO, and dust), reduction of emissions with a target of a 20% reduction by 2020, and a 10% reduction of waste between 2008-2012. It is clear from the documents and reports available to me that the SAF has taken a fairly serious approach to reducing the consequences of human impact on the environment.

The fact is that the effects of climate change will not be fully preventable in the future. Both the MoD and the SAF are aware of the importance of preparedness, competence, and rapid response to potential extreme events. Following the legislation, MORS plans to deploy both Civil Protection and SAF members in the event of natural and other disasters.

Perhaps in the future, the MORS and the SAF could pay more attention to educating young people in particular that water and food are not commodities to be taken for granted. It may happen that one day water will no longer flow from taps and food will run out in shopping centers. Winston Churchill once said, "If we don't do something, it will do itself, and in a way that nobody likes." (Bogataj Kajfež 2009, 9)

Attitudes of European Citizens toward Climate Change

In early October 2011, the European Commission published the results of a Eurobarometer opinion poll on Europeans' attitudes towards climate change. The opinion poll was conducted in June 2011 in the 27 Member States of the European Union. 26,840 EU citizens were surveyed. More than two out of three respondents in the survey considered climate change to be a very serious problem. Compared to the 2009 survey, the results show that the European public is now more concerned about climate change. The survey shows that climate change is one of the world's most serious problems. The most concerned about climate change are people in Sweden, Denmark, and Slovenia. 68% of respondents in Sweden and 67% each in Denmark and Slovenia consider climate change to be one of the most serious problems. The Portuguese, Estonians, and Czechs are the least concerned about climate change. As regards responsibility for tackling climate change, respondents to the survey overwhelmingly see this as the responsibility of national governments, the European Union, and businesses. Only 21% of respondents believe that they also have a personal responsibility, while 23% say that responsibility in this area is a shared responsibility of all, including individuals. The survey also

showed that the public wants Europe to become a climate-friendly society by 2050. 88% of respondents expect Europe to use more renewable energy in 2050, 87% expect Europe to be more resource-efficient and 73% expect cars to be more efficient than they are now. The survey shows that Europeans consider poverty, hunger, and lack of drinking water to be the most serious global problems. This is followed by concerns about climate change and only in third place is the economic situation and in fourth place is terrorism, according to Eurobarometer." The European Commission's opinion poll shows that Europeans are concerned about climate change. Concerns about climate change rank ahead of economic problems and terrorism. 67% of Slovenians consider climate change to be one of the most serious global issues, which puts us at the top of the list of concerns. The memory of the catastrophic floods and landslides of the last two years probably contributed to this high percentage of Slovenians concerned about climate change (Delo 2011).

However, the survey result is misleading in that only 21% of respondents feel they have a personal responsibility to tackle climate change. The majority of respondents believe that national governments, the European Union, and the economy are responsible. The European Union and national governments will have to do a lot more to convince their citizens that they also have a personal responsibility to tackle climate change. Climate change is not happening somewhere else. Climate change is happening now, not in some distant future. Climate change is not just a global problem that small countries or individuals can do nothing about. It is very important to realize that it is every individual who can do the most to combat climate change by acting responsibly (President of the Republic 2006, 122).

Conclusion

Scientists agree that the atmosphere and the Earth's surface have been warming much faster in the last 150 years than in the past. The rate of temperature increase is remarkable compared to temperature changes throughout Earth's history. The reasons for such rapid temperature increases are diverse. There are two different scientific views on the cause of the recent high-temperature rise. Most scientists blame rapid warming largely on humans, mainly because of their irresponsible behavior. According to scientists belonging to the Intergovernmental Panel on Climate Change (IPCC), man-made warming is responsible for 35% more carbon dioxide accumulating in the atmosphere than existed before the Industrial Revolution. Carbon dioxide is thought to be the main culprit in the rise in global temperatures. This amount of carbon dioxide is set to double by 2060 if humans do not change their relationship with the Earth.

A smaller group of scientists, however, takes the opposite view. They argue that the warming of the atmosphere, and consequently of the Earth, is due to natural cycles and not to human actions. According to them, the climate has changed in the past, without human influence. For them, alternating warm periods and ice ages are commonplace. It is cyclical warming and cooling of the atmosphere. It is all supposed to depend on

the solar cycle, which unfortunately we do not know today. They argue that increases in carbon dioxide or other greenhouse gases should not affect global warming. Any effort to reduce greenhouse gases in the atmosphere is, in their view, pointless. Measures to reduce greenhouse gases are only supposed to cost a huge amount of money and are completely ineffective.

Whatever scientists' views on the causes of global warming, it is a fact that the Earth's atmosphere is warming. The drastic increase in the world's population, the uncontrolled exploitation of natural resources, and excessive pollution are certainly not without consequences. The world economy is based on capital and neoliberalism. This has resulted in the limitless exploitation of ecosystems and natural resources. The consumer fever, which has now been confined to the developed part of the world, will very soon be joined by billions of people from emerging economies, especially China, India, and Brazil. Scientists have recently been increasingly asking questions about the consequences of such rapid global warming. According to the IPCC, global atmospheric temperatures are expected to rise by 1.4 to 5.8 °C between 1990 and 2100. Such an increase in temperatures poses a serious threat to our planet. The consequences of climate change may soon have a profound impact on the most basic living conditions of people around the world, threatening both individual security and the security of the international community as a whole. The impacts of climate change may exacerbate the availability of water and food. The issue of basic living space may arise.

Given that the amount of available drinking water is expected to decrease by 20 -30% in some areas of the world, water scarcity is expected to be severe. Water could therefore become a major commodity very soon. Countries that want to ensure an uninterrupted supply of food and water will struggle to manage increasingly scarce resources and to protect access to them. Rising sea levels could seriously threaten the one-third of the world's population that lives along coastal areas. Territories and even countries could disappear as the sea line moves landwards. In many parts of the world, long droughts and increased flooding are already reducing arable land. A greater decline in agricultural production could lead to food insecurity and, as a consequence, drastic increases in global food prices. Non-subsistence countries could be particularly affected. Slovenia is one of the countries that are not self-sufficient.

Climate change could also have a major impact on global energy markets. Energy could become increasingly expensive and harder to access. The biggest impact is expected on fossil fuels: oil and coal. Oil is one of the most important sources of energy in the world, so a shortage or a drastic increase in prices would have major consequences for all countries, including Slovenia. The consequences of climate change will also have a major impact on the health and well-being of people, animals, and plants. Climate change could have an impact on the increase in the number of certain species of animals that have so far not posed a significant threat to humans. Scientists estimate that 50 to 350 million people

worldwide will have to leave their homes by 2050 as a result of climate change. Environmental refugees could lead to political tensions between countries or, in extreme cases, even to new hotbeds of war.

Climate change is expected to increase the frequency and intensity of extreme weather events such as floods, droughts, heat waves, high winds, hurricanes, extreme cold, hail, and more. These extreme weather events will cause significant economic and material damage. Climate change could therefore trigger a variety of crises: political, economic, energy, migration, social, health and epidemiological, and others. If left unchecked, these crises could escalate into conflicts and ultimately into armed conflict. Climate change must therefore be seen as a non-military threat, but one that could very soon become a military threat. We can therefore confirm with certainty the first hypothesis that climate change has an impact on national security. Countries around the world identify climate change as a global threat that could pose a significant threat to countries around the world. Various international instruments have been signed or ratified at the international level to reduce the human impact on the environment. One of these international instruments is the Kyoto Protocol. However, some large countries are not obliged to comply with the requirements arising from the Kyoto Protocol. India and China have ratified the Protocol, but are not obliged under the agreement to reduce carbon emissions. The USA signed the Protocol but subsequently did not ratify it.

In their national legislation, individual countries recognize the impacts of climate change as a global threat and respond to it differently. Slovenia has also identified climate change as a global threat and risk to national security.

The European Commission's survey of Europeans' attitudes to climate change shows that Europeans see climate change as a very serious problem. The survey shows that climate change is one of the most serious global issues for Europeans. Concerns about climate change rank ahead of economic problems and terrorism.

Interestingly, only a fifth of respondents in the survey feel they have a personal responsibility to tackle climate change. The majority of respondents believe that national governments, the European Union, and the economy are responsible. According to the results of the European Commission survey, we can confirm the second performance hypothesis that Europeans are aware that climate change is a very serious issue.

With only one-fifth of Europeans feeling personally responsible for tackling climate change, the European Union and national governments will need to do more to convince their citizens that they too have a personal responsibility to tackle climate change.

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