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Climate Change as a Threat Multiplier

SPECIAL

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and Conflict Management

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EDITORIAL

Global climate change poses an existential danger to humanity, but has faded into the background somewhat during the coronavirus pandemic. Now the issue is back with force. In the United States, President Biden formally rejoined the Paris climate agreement on the day of his inauguration, and has since announced very ambitious climate targets. In Germany, climate protection has remained a focal point of political debate even during the pandemic, and is one of the key issues in the upcoming parliamentary elections. The UN Climate Change Conference (COP26) promises to be an interesting event. It was postponed because of the pandemic and will now take place in Glasgow in November 2021. Will the international community agree on further improvements to limit global warming to well below two degrees Celsius?

The fact is that the past decade was the warmest since weather records began 140 years ago, and 2015 to 2020 were the six warmest years in that whole period. Climate change threatens the livelihoods and health of millions of people – especially in vulnerable regions of the global South. Possible consequences include a worsening of economic inequalities, conflicts over resources, the migration of refugees and displaced persons, and even the collapse of state structures.

Pope Francis drew attention to the dangers of climate change in 2015, in *Laudato si'*, the first ever encyclical letter about the environment. In this text, he describes climate change as “one of the principal challenges facing humanity in our day” and a “global problem with grave implications: social, economic, [and] political [...]”.

Although there is now a broad consensus within the global community that the impacts of climate change may threaten the living conditions of many people, it is a much disputed topic whether and how climate change contributes to the emergence of armed conflicts. During its two-year membership of the United Nations Security Council from 2019-20, Germany tabled a draft resolution describing climate change as a threat to international peace and security. The proposal was blocked by the United States, Russia and China.

It would no doubt be a simplification to say that the impacts of climate change will inevitably lead to armed conflicts. However, with increasing fragility in regions of the world such as sub-Saharan Africa and the Horn of Africa, they should certainly be taken seriously as threat multipliers. These dangers must be considered when assessing the needs and focus of humanitarian aid and disaster relief, international development cooperation, efforts to promote peace and resilience, and state-building.

This brings us to the tasks and instruments of classical security policy. There is increasing pressure to integrate crisis prevention and conflict preparedness more strongly into security policy concepts. At the same time, demand is growing for the military to become more sustainable, given its enormous consumption of financial and ecological resources. For our armed forces, this means modernizing their equipment and at the same time adapting their capabilities in light of potential new operational scenarios.

I am delighted to present this new edition of *Ethics and Armed Forces*, which puts forward an extremely important topic for discussion. I would like to take this opportunity to thank the authors for their intelligent and thought-provoking contributions, and I wish you an enjoyable read.

Dr. Veronika Bock
Director of zebis



IF YOU WANT PEACE, PROTECT THE CLIMATE!

Author: *Andreas Lienkamp*

Previously...

In 2015, Pope Francis released *Laudato si'*, the very first encyclical letter to address the environment. In it, he states that “climate change is a global problem with grave implications: environmental, social, economic, political, and for the distribution of goods. It represents one of the principal challenges facing humanity in our day” (LS 25).¹ That same year, the United Nations Climate Change Conference adopted the *Paris Agreement* – the new climate treaty, binding under international law, that has since been ratified by 191 countries. The signatory countries recognize an “urgent threat” in global warming that is a “common concern of humankind”.²

The situation

The years 2015 to 2020 were indeed the six warmest years and the past decade the warmest decade on record. 2020 was one of the three warmest years, along with 2016 and 2019, according to the World Meteorological Organization.³ Experts are in complete agreement, based on solid evidence, that current climate change is anthropogenic.⁴

There are two main causes: massive greenhouse gas emissions currently amounting to around 50 billion metric tons of carbon dioxide or CO₂-equivalents per year,⁵ and the large-scale destruction of forests and other important carbon sinks. The gases that harm the climate are mainly caused by burning fossil fuels for electricity and heat generation, and for civil and military aviation, shipping, and road transportation. Gases are also emitted by industry, especially cement production; from the flaring and venting of associated gas during oil extraction; from the waste sector; as a result of deforestation, and from forest and bush fires; as well as from industrial agriculture and livestock farming. Another factor is the increase in per-capita consumption of energy and resources, combined with an ever-growing human population.

Despite all the shutdowns and lockdowns during the COVID-19 pandemic, CO₂ emissions

Abstract

Not only do we know the effects of anthropogenic climate change (which are increasingly being felt) – rising sea levels, extreme weather events with destructive consequences, devastating bush and forest fires, the triggering of negative self-reinforcing processes and the loss of biodiversity, even of entire habitats and ecosystems – we also know who's causing it. Wealthy industrialized nations, many of them members of the NATO “alliance of values”, make a disproportionately large contribution to greenhouse gas emissions. Yet they are far less affected by the consequences. To rectify this situation requires a theologically based concept of climate justice. First, it is important to clear up a misapprehension: the human species has no kind of right to treat Creation as it pleases. The key verses of Genesis emphasize man's responsibility and duty to protect the Earth and all Creation on it. From the intrinsic worth of our fellow creatures and the inviolability of human dignity, three main aspects of climate justice can be distinguished: global, intergenerational, and ecological.

If, against our better judgement, we accept that entire regions and the living beings that populate them may be harmed or lost, then this amounts to a fundamental state of strife – and not only from a theological and ethical perspective. Whether we side with the inhabitants of small Pacific island states, who face being inundated by the oceans, or refer to largely unanimous scientific and policy studies, it is clear that water and food scarcity, the loss of national territory and people's homes, increased migration and the destabilization of whole regions have an exacerbating effect on conflicts. Instead of continued spending on military defense, the available resources – especially those of powerful states and actors – should be directed toward prevention. That means climate protection, in keeping with the precept of common but different responsibilities and respective capabilities. Time is running out, but it is not too late yet. Civil society pressure must be maintained, and the principle of climate justice must increasingly find expression in judicial decisions. Finally, the equitable pricing of goods and services from an environment and climate point of view could send an unmistakable signal and mark the beginning of a transformation: as Pope Francis calls for in “Laudato si'”, of our consumption-oriented, short-term-profit focused economy and way of life.

from the use of fossil fuels and cement production only fell by 5.3% in 2020 compared to 2019.⁶ This reduction was wiped out by the increase in forest and bush fires alone.⁷ As a result, the concentration of this long-lived gas in the atmosphere climbed still higher – and has now risen by almost 50 percent since the pre-industrial era.⁸ The upward trend is continuing.

The devastating consequences are well known: climate change is already injuring and killing countless people and other living beings through extreme weather events such as storms, heavy precipitation and heat – with increasing frequency and/or intensity. The consequences include storm surges, floods, droughts, as well as forest and bush fires – all of which have dangerous impacts on lives, health, water supplies, and food. Sea levels are rising, slowly but steadily flooding low-lying coastal zones, islands and river deltas and causing soil and freshwater salinization. This in turn is detrimental to the livelihoods of local populations and may damage or completely destroy their habitats. Climate zones are shifting – with disastrous consequences for biodiversity. Entire ecosystems, such as coral reefs, are collapsing. Apart from warmer water, this is also due to the enormous ocean uptake of CO₂, which in turn makes the ocean more acidic. This has a huge negative effect on shell-forming organisms and hence also on the food chain.

Making things worse is the fact that consequences of climate change can themselves become causal. Climate research refers to “positive” feedback loops or “tipping points” that humans are currently triggering or could soon reach. These include lowering the albedo, i.e. the amount of sunlight reflected back off the Earth. This happens as ice and snow-covered areas melt. As a result, the ground and air become warmer, while more bright areas disappear, causing the temperature to rise still further, and so on.

Of the members of the North Atlantic Treaty Organization, three countries – the United States, Germany, and Canada – are among the top ten emitters of greenhouse gases. NATO’s thirty member countries, making up some twelve percent of the global population, were

responsible for disproportionately high emissions of 10.63 billion metric tons CO₂-equivalent in 2018. That is around 22 percent of global greenhouse gas emissions.⁹ Four-fifths of NATO members are OECD countries. Taking per-capita gross domestic product (GDP) as an indicator of wealth, in 2019 five NATO members were among the world’s ten richest countries, ten among the twenty richest, and 22 among the fifty richest. The populations of almost all alliance members (except for Albania and North Macedonia) are counted among the richest

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third of the world’s nations. Consequently, it is here that the legal and ethical obligation of the polluters to cut emissions joins together with a high economic capacity in regard to climate protection, adaptation, and reparation of loss and damage. The basis in international law is the principle of “common but differentiated responsibilities and respective capabilities”, which was laid down in the 1992 *Rio Framework Convention on Climate Change* and reaffirmed in the Paris Agreement (cf. Art. 3 No. 1 UNFCCC, Art. 2 II Paris Agreement).

Assessments

Some unfortunate misinterpretations are stubbornly persistent in many people’s minds when it comes to the tasks which God assigns to our species in relation to the Creation. These obligations are to be found in the Book of Genesis, specifically in the first two chapters, which form an artfully connected whole. The four meaningful Hebrew verbs contained in these chapters originally stand for: 1. not a violent “dominion” or “domination”, but a non-violent administration of the land and the animals in the sense of a *caring stewardship*, as was expected of a good regency (cf.

Genesis 1:26-28); 2. not primarily a “tilling” or “farming” but rather the obligation to serve the soil and the Paradise Garden, as only then does it remain fertile (cf. Genesis 2:5.15); 3. not a “subduing” or “subjugation” of the earth, but setting a foot on it, which in ancient times was understood as a gesture of *protection* (cf. Genesis 1:28); for 4. man is to *guard, preserve, and care for* the Garden of Eden, the biotope Earth (cf. Genesis 2:15). The prophetic books also explain God’s idea of a successful world: justice and righteousness shall reign; there shall be shalom: that is, a life-enhancing political, legal, social, and creaturely order. In a wider sense, there shall be a non-threatened well-being, happiness, quietness and assurance, comprehensive salvation for all, including future generations. “And the work of

some inevitable fate, but rather represents a massive injustice that only intensifies existing inequality.”¹²

This state of affairs undermines global security and is the opposite of climate justice. Climate justice can be achieved in any system, status, law, situation, relationship, measure or action, but only if the legitimate claims – i.e. the *rights* – of all those who are affected or threatened by climate change and its consequences are adequately taken into account. However, we owe justice not only to our nearly eight billion fellow human beings, but also to future generations and our fellow creatures. The latter two “groups” have done nothing to cause climate change. However, they are suffering or will suffer most from its consequences. In addition, they cannot stand up for their rights themselves. The reasons why we have an obligation toward those living now and in the future are obvious: the equal, inviolable human dignity of all human beings, as well as the intrinsic value of extra-human Creation (cf. Genesis 1:31). *That is why* we have an obligation to respect them and protect their rights.

The German bishops also emphasize that anthropogenic climate change “is a question of justice at three levels: global, intergenerational, and ecological.”¹³ From an ethical perspective, the most serious injustice is the one between the main emitters who cause the rise in temperature, and those who suffer most because of it: 1. between the heavy-emitting rich industrialized nations, emerging economies, and elites in developing countries on the one hand, and the poor, vulnerable countries of the global South on the other, especially in Africa and the South Pacific; then 2. between adults living now on the one hand and the youth, children unborn, and generations yet to come on the other; and finally, 3. between current adult humans and extra-human nature.

With regard to the completely inadequate German Federal Climate Change Act, the German Federal Constitutional Court in its decision of March 24, 2021 found that there had been a violation of the principle of intergenerational justice (see 2. above). The adult generation now living “must not be allowed to consume large portions of the CO₂ budget while bearing

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righteousness shall be peace” (Isaiah 32:17). Solidarity, meaning commitment to justice, must therefore also be paramount when dealing with the Earth, its creatures, and its climate system.

The actual situation around the world, however, is far removed from this ideal. “Already today, the struggle for scarce ecological resources (water, minerals, agricultural land, etc.) [...] is a frequent cause of armed conflict,” the German bishops noted back in 1998 in their document *Action for the Future of Creation*.¹⁰ Two years later, in a pastoral letter entitled *A Just Peace*, they warned about global warming being a possible cause of migration and war: “Changes in the earth’s atmosphere will influence our climate and have unforeseeable consequences [...] forcing the local population to abandon their traditional living spaces. Special attention must be paid to water supply. Experts are worried that water, not oil, could be the cause of future conflicts.”¹¹ And in 2007, the Bishops told us that the “dangerous anthropogenic influence on the world climate is not

a relatively minor share of the reduction effort if this would involve leaving subsequent generations with a drastic reduction burden and expose their lives to comprehensive losses of freedom.”¹⁴ This would be an unconstitutional infringement of young people’s liberties. Therefore, the legislative body must now take appropriate precautionary steps to reduce the burden of mitigation imposed on current children and young people from 2031 onwards¹⁵ and to “ensure a transition to climate neutrality that respects freedom.”¹⁶

As the former prime minister of the island nation of Tuvalu, Saufatu Sopoanga, forcefully told the UN General Assembly, the threat posed by climate change and its consequences “is real and serious, and we liken it to a slow and insidious form of terrorism against us.”¹⁷ Marlene Moses, the UN ambassador from neighboring Nauru, makes a very similar assessment: “Climate change can devastate countries just like wars and attacking armies.”¹⁸ It is obvious *who* the aggressor is here: it is the countries that emit the greatest amounts of greenhouse gases. But how are these assertions to be judged? Are they exaggerations by the political elites of two small countries who want to appear important in the eyes of the world?

That this is not the case is shown by the fact that the United Nations Security Council (UNSC) has expressed analogous views. In July 2011, this most powerful UN body discussed the dangers of climate change and instructed its president to issue a statement. This communiqué underlined the body’s responsibility in preserving peace and security, but also in promoting sustainable development. The Security Council expressed concern that climate change could exacerbate existing risks. The statement was prompted by an urgent request from Pacific island nations, which are already clearly feeling the adverse effects of global warming. As an example, the document cites the rise in sea levels, which threatens small, low-lying nations with the loss of their national territory, or at least the permanent flooding or salinization of large areas of land.¹⁹

The consequences would be firstly conflicting over increasingly scarce (fertile) land, drinkable water, and food, and secondly migration

and flight. Overall, there will be a rise in the number of people taking refuge from drought, storms or floods, who have to give up their home and security. In addition, those who can no longer return will have to be permanently accommodated and integrated elsewhere. Such developments do not usually proceed without conflict. Certainly, this declaration is not a resolution of the UNSC, but a statement

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by its president. Nevertheless, the statement is highly significant as an impetus for reassessing the dangers of climate change.

In its 2007 flagship report, the German Advisory Council on Global Change also discussed *Climate Change as Security Risk*, noting that “without resolute counteraction, climate change will overstretch many societies’ adaptive capacities within the coming decades. This could result in destabilization and violence, jeopardizing national and international security to a new degree. [...] Climate change will draw ever-deeper lines of division and conflict in international relations, triggering numerous conflicts between and within countries over the distribution of resources, especially water and land, over the management of migration, or over compensation payments [...]”²⁰

In its 2016 *Global Strategy for the European Union’s Foreign and Security Policy*, the EU identifies climate change as a current threat to its population and territory, in addition to terrorism, hybrid threats, economic volatility, and energy insecurity.²¹ It causes further disruption, on top of existing global difficulties:²² “Climate change and environmental degradation exacerbate potential conflict, in light of their impact on desertification, land degradation, and water and food scarcity.”²³

In this context, the EU uses the interesting term “pre-emptive peace”: “It has long been

known that preventing conflicts is more efficient and effective than engaging with crises after they break out. The EU enjoys a good record on pre-emptive peacebuilding and diplomacy. We will therefore redouble our efforts on prevention, monitoring root causes such as human rights violations, inequality, resource stress, and *climate change* – which is a *threat multiplier* that catalyzes water and food scarcity, pandemics and displacement.²⁴ But what if prevention fails? My answer is: as long as the various precautionary options through the generation of more equitable domestic and

What would we do if the AOSIS states were the main emitters, beneficiaries and also among the least vulnerable, and we, the populations of NATO members, were among the low-emission, highly vulnerable countries to suffer particular harm?

international structures have *not even begun* to be used earnestly, let alone been maxed out, we should direct all efforts toward *success*, instead of continuing to drive up global military spending. It reached USD 1,981 billion in 2020, according to SIPRI – a 2.6 percent increase in real terms over 2019, despite the pandemic. Just imagine if this money were used to implement the 17 Sustainable Development Goals, i.e. if it were spent on climate protection and poverty reduction, for example.²⁵

The Alliance of Small Island States (AOSIS), representing almost one fifth of UN member countries, invites us to try another thought experiment. What would we do if the situation were reversed? In other words, if the AOSIS states were the main emitters, economic beneficiaries and at the same time among the least vulnerable, and we, the populations of NATO members, were among the low-emission, highly vulnerable countries to suffer particular harm. How would we react if the island states regarded our dead and injured as mere collateral damage, so to speak, that had to be accepted as an unavoidable side effect of lifestyles cultivated on the other side of the planet? Would NATO invoke Article 5 of the *North Atlantic Treaty* and threaten to destroy the Pacific states' coal-fired power plants? Would Ger-

many's security then be defended not only in the Hindu Kush but also in the South Pacific? If so, then we would also have to concede to the AOSIS states the right to defend *their* freedom on the Rhine, Elbe and Danube rivers. As I said, this is only a thought experiment. Violence will not solve the climate crisis – only fair international cooperation will. Article 1 of the *North Atlantic Treaty* also points in this direction. It states that member parties, in accordance with the *UN Charter*, shall “settle any international dispute in which they may be involved by peaceful means in such a manner that international peace and security and justice are not endangered, and to refrain in their international relations from the threat or use of force in any manner inconsistent with the purposes of the United Nations.” That NATO does not wish to endanger justice is a noble goal. However, it would be better to actively promote the values of democracy, individual liberty, and the rule of law – which are declared fundamental in the preamble to the treaty – in the global context, but also within NATO's own ranks (e.g. in Turkey, Poland and Hungary).

Yet the glaring discrepancy between the main emitters and the main sufferers is not the only injustice. It is also extremely unfair that the vast majority of polluter states and many of the stakeholders in their societies block or weaken climate protection measures out of pure national, corporate or individual greed. Even the attempt to do so violates the principle of justice established in Rio and Paris as a common obligation of the international community. Moreover, in international environmental law and international criminal law, it is being discussed whether this might even constitute intentional ecocide or postericide, i.e. a crime that calls for appropriate sanctions by means of a climate lawsuit.²⁶ There are welcome efforts, supported by Pope Francis²⁷ among others, to include ecocide in the *Rome Statute* of the International Criminal Court, along with genocide, crimes against humanity, war crimes and the crime of aggression.²⁸

Another injustice consists in denying or downplaying climate change itself, the causal importance of greenhouse gases, and/or humanity's responsibility as the causer of glob-

al warming. Healthy skepticism is a scientific virtue. However, anyone who sows doubt on the scientific reliability of climate research, or on the credibility of experts and their widely verified and validated results – a favorite tactic employed by the oil and coal lobby (from the U.S. to Europe and the Middle East to Australia), as well as by right-wing populist parties and the media close to them – out of a lack of willingness to obtain information from verified sources, or against their own better judgment, or, worse still, out of pure egoism, is guilty of concealing or downplaying climate-related human rights abuses and attacks on Creation.

What is to be done

Pope Francis calls on humanity to “recognize the need for changes of lifestyle, production and consumption, in order to combat this warming or at least the human causes which produce or aggravate it” (LS 23). In the *Paris Agreement*, the international community commits to the goal of net-zero emissions, i.e. “to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases [e.g. forests] [...] on the basis of equity” (Art. 4 I). To achieve this, CO₂ emissions, but also emissions of nitrous oxide and methane from agriculture, methane from livestock farming and waste management, of black carbon²⁹ and hydrofluorocarbons must be significantly reduced as soon as possible.³⁰

However, all of the nationally determined contributions (NDC) to climate protection will not be enough to keep the rise in global temperature below the agreed limit of 1.5 degrees Celsius – especially since warming of 1.2 ± 0.1 °C has already taken place (compared to the period 1850 to 1900). “With countries’ current climate plans, it will be 2.6 °C warmer in 2100 than before the industrial revolution,” says Christian Mihatsch on klimareporter^o.³¹ In the best case, the global average temperature will “only” rise by 2.1 °C, in the worst by 3.3 °C.³² While the former would be dangerous, the latter would be catastrophic.

It is true that 127 countries, which are responsible for two thirds of emissions, are now aiming for the net-zero target. However, it is

crucial to substantially revise the NDC targets for 2030 and accelerate their implementation in policy to ensure that the long-term goals can be met: “Steeper emissions reductions over the next five to ten years will be essential.”³³

In its latest report, the Intergovernmental Panel on Climate Change (IPCC) stated that humanity may only emit a further 420 to a maximum of 570 billion metric tons of CO₂, if we want to limit warming to 1.5 °C with a two-thirds probability.³⁴ That sounds like a lot, but it is not, because current global emissions are 42, maybe even 45 billion metric tons of CO₂ per year. If we follow the precautionary principle and assume the lower value for the remaining budget and the higher value for current emissions, then our “dumpsite”, i.e. the atmosphere, would be at capacity in just nine years, i.e. in 2030. We can only extend this period through immediate ambitious climate action.

Thus, there is no alternative to an immediate turnaround. In their *Ten theses on climate protection* from 2019, the German bishops warn: “It

Since any half-heartedness or delay in climate protection will cause greenhouse gas concentrations to rise further, the challenge and the financial cost of bringing them under control will grow simultaneously

is equally a question of justice and political wisdom to invest more resources in mitigating climate change and adapting to its consequences. In addition, this is increasingly proving to be a major contribution towards peacekeeping and in the international fight against the causes of displacement and migration.”³⁵ Since any half-heartedness or delay in climate protection will cause greenhouse gas concentrations to rise further, the challenge and the financial cost of bringing them under control will grow simultaneously. *This is why* it makes more sense politically but also economically to prevent the explosion of costs that will otherwise occur, not to mention preventing the suffering of countless creatures as a result.

This requires a mix of instruments comprising a wide variety of technical and policy measures. Nevertheless, there is a *silver bullet*. Ernst Ulrich von Weizsäcker summed it up: “Prices must tell the truth.”³⁶ In other words, the ecological and social costs incurred in production and consumption must no longer be passed on to other people, living beings and generations, but must be fully priced in. This will make goods and services that harm the climate much more expensive – and they will probably disappear from the market in the long term – while making climate-friendly goods significantly more attractive.

For all their differences, COVID-19 and climate change have some things in common. In both cases, the danger is only noticeable or visible to those affected and to experts, yet both threats objectively exist and are complex, global in scope and terrible because of their massive negative impacts, which mainly affect the poor. And in both cases, inaction, a lack of solidarity and a lack of caution are deadly and therefore absolutely irresponsible. The current pandemic has shown that despite all the sometimes considerable implementation problems, policymakers can be open to advice and capable of taking action, and that they are able to put in place what is necessary and needed in an emergency. All of this would also be called for in the climate crisis: recommendations from the scientific community have been taken into account, billions have been made available, tough laws and regulations have been enacted. For the much-needed containment of global warming, this is just as encouraging as the unrelenting efforts of the *Fridays For Future* movement. One can only hope that the

young climate activists’ dedication will soon be able to unfold its full effect again, so that they – together with *Scientists for Future* (S4F) and other allied partners – will succeed in placing this vital issue at the top of the political agenda. Faced with the powerful lobbyists of the fossil fuel industries, a strong civil society counterforce is needed.

Last but not least

The momentum, the opportune instant, the right time (cf. LS 59) is here for the great transformation of the economy and society toward strong sustainability and effective climate protection. If the global warming crisis is finally recognised as such and taken seriously, there is still hope. “For we know that things can change,” Pope Francis tells us (LS 13). Humankind is still capable of leaving the chosen path and taking positive action (cf. LS 58, 61, 205); “injustice is not invincible” (LS 74). But let us not deceive ourselves: “The entire system” must be “reviewed and reformed” (LS 189). Even more than that, according to Pope Francis: We urgently need a “bold cultural revolution” (LS 114).³⁷

Si vis pacem, conserva caelum: If you want peace, protect the climate!

1 Francis (2015): Encyclical Letter *Laudato Si’ On Care for Our Common Home*. Vatican 2015. Henceforth cited as LS plus paragraph number. – I wish to thank the editors of *Ethics and Armed Forces* and especially Mr. Rüdiger Frank, scientific research editor, for their constructive criticism, and Mr. Richard Hewitt for the German-English translation of this article.

2 *Paris Agreement* (2015), in: *Bundesgesetzblatt* (Federal Law Gazette) vol. 2016 part II no. 26, published in Bonn on September 30, 2016, pp. 1082-1106, pp. 1083 f. http://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl&jumpTo=bgbl216s1082.pdf (all links were checked on April 7, 2021).

3 WMO (2020): *2020 closes a decade of exceptional heat*. Geneva, December 24, 2020. <https://public.wmo.int/en/media/news/2020-closes-decade-of-exceptional-heat>.

4 In 2019, James L. Powell and his team reviewed no less than 21,000 thematically relevant scientific articles in recognized journals. One hundred percent (!) of those articles assumed that global warming is anthropogenic. Cf. Powell, James L. (2020): *Scientists Unanimous on Anthropogenic Global Warming in 2019*. In: *Bulletin of Science, Technology & Society* 39, issue 1-2, pp. 3-3. <https://journals.sagepub.com/doi/10.1177/0270467620922151>.

The Author



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- 5 WRI – World Resources Institute (2021): *Climate Watch. Historical GHG Emissions*. Washington, DC, <https://www.climatewatchdata.org/ghg-emissions>. Greenhouse gases differ greatly in their global warming potential, which can be expressed in terms of an equivalent amount of CO₂. For example, 1 kg of methane is equivalent to about 28 kg of CO₂; 1 kg of nitrous oxide to around 265 kg of CO₂. The unit of measurement is called CO₂-equivalent.
- 6 Carbon Monitor (2021): *CO₂ emissions variation*. <https://carbonmonitor.org/>.
- 7 NOAA (2021): *Can we see a change in the CO₂ record because of COVID-19?* Silver Spring, MD. <https://www.esrl.noaa.gov/gmd/ccgg/covid2.html>.
- 8 In March 2020, the recorded value was 414.74 parts per million (ppm). Exactly one year later it was 417.64 molecules of CO₂ per 1 million gas molecules in dry air. Cf. Tans, Pieter / Keeling, Ralph (2021): *Trends in Atmospheric Carbon Dioxide*. <https://www.esrl.noaa.gov/gmd/ccgg/trends/>. Over the past 800,000 years, the value has never exceeded 280 ppm, according to NOAA (2021): *History of atmospheric carbon dioxide from 800,000 years ago until January, 2019*. <https://www.esrl.noaa.gov/gmd/ccgg/trends/history.html>.
- 9 Cf. WRI 2021 (see note 5).
- 10 Die deutschen Bischöfe (1998) – Kommission für gesellschaftliche und soziale Fragen: *Handeln für die Zukunft der Schöpfung* (Die deutschen Bischöfe – Kommission für gesellschaftliche und soziale Fragen 19, hrsg. vom Sekretariat der Deutschen Bischofskonferenz). Bonn, no. 19 (translated from German).
- 11 The German Bishops (2000): *A Just Peace* (The German Bishops 66, published by the Secretariat of the German Bishops' Conference). Bonn, no. 66.
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