

# Defense and Environment: the performance of the Brazilian Armed Forces in the face of the climate crisis

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## Executive summary

Climate change is often characterized as an unconventional threat (UN, 2021) whose risks are not easily mitigated by the use of conventional power resources, nor do they arise from the intentional action of one or more easily identifiable actors. Climate effects have repercussions in space and time, simultaneously presenting themselves as a transnational threat, by crossing the territorial borders of states, and intergenerational, with tendencies to affect future generations more sharply (Mobjörk *et al.*, 2016).

As a sector dedicated to the “defense of the National Territory, sovereignty and national interests against predominantly external, potential or manifest threats” (Brasil, 2020a), national defense, together with other sectors of Brazilian society, must be included in multidimensional efforts aimed at facing the climate crisis. This movement, however, must be conducted in order to avoid potential pitfalls resulting from a process of environmental “securitization” (Buzan *et al.*, 1998; C.A.S.E., 2006). Due to their particularities, appropriate strategies to mitigate climate risks can often contrast with the rationalities and practices characteristic of the defense area. Still, as this policy paper will seek to illustrate, the Armed Forces (FA for its acronym in Portuguese) and other defense institutions play a crucial role in climate mitigation and adaptation initiatives, especially in the Brazilian context.

Based on the diagnosis that the challenges posed by climate change tend to become more acute over time, thus requiring coordinated efforts between multiple sectors, this policy paper is dedicated to shedding light on the links between the areas of defense and the environment in Brazil. The sustained argument is that the deepening of the global climate crisis makes this connection even closer, since, on the one hand, without the support of the national defense sector, Brazil will certainly not be able to guarantee its objectives and commitments in the environmental area, on the other, the changing climate will certainly lead to new challenges for institutions linked to national defense.

The theme assumes significant relevance in the current situation, considering not only the very serious manifestations of the climate crisis verified in Brazil and in the world, but also recent political movements that tend to drive an even closer rapprochement between these two areas. In this sense, the inauguration of the Interministerial Committee on Climate Change (CIM for its acronym in Portuguese) stands out, which clearly signals the tendency for the topic to be addressed in a more structuring and transversal way, the recent regional



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commitments made in the context of the Summit of the Amazonian Cooperation Treaty Organization (ACTO) and, finally, the ongoing work to update the Defense Green Paper.

This text is organized as follows: firstly, from the conduct of a bibliographic and documentary analysis, broader considerations are presented about the inclusion of the so-called “new threats” or “non-traditional threats” in the theoretical agenda and security and defense policy. Secondly, through a brief historical retrospective, tensions, ambiguities, and convergences that permeated the trajectories of environmental protection and national defense policies in Brazil are pointed out. Next, through the analysis of Brazilian legislation and high-level defense and security documents, I sought to emphasize the connections between these two areas, paying special attention to the performance of the Armed Forces in subsidiary operations linked to the environmental area. Considering the growing challenges and risks posed by climate change to national security and human security, the fourth section focuses on the analysis of the role of Brazilian defense institutions in the face of climate mitigation and adaptation strategies. Finally, based on the developments of the research, the following policy recommendations were elaborated: 1) Promotion of the “climatization” of national public policies, including the Defense sector; 2) Diagnosis of the vulnerability of defense infrastructures and the operability of Brazilian Armed Forces in the face of growing climate risks and 3) Promotion of cooperation with research and defense institutions in other South American countries, aiming at improving alert and monitoring systems and adding efforts to combat environmental illicit acts.

### **KEYWORDS**

Climate Change; National Defense; Climate Mitigation; Climate Adaptation.

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## 1. Introduction: the inclusion of non-traditional threats in security and defense strategies

For decades, environmental issues have been marginalized from the theoretical and political fields of security and defense. In the academic sphere, the idea that the analyzes should strictly fall on themes that represented direct threats to territorial integrity and the interests of national states such as military conflicts used to prevail. In Stephen Walt's words (1991), recognized as one of the most prominent authors in the field of International Security Studies (ISS), are illuminating in this sense:

The main focus of security studies is easy to identify, however: is the phenomenon of war. (...) It explores the conditions that make the use of force more likely, the ways that the use of force affects individuals, states and societies, and the specific policies that states adopt in order to prepare for, prevent, or engage in war (Walt, 1991, p. 212).

Still, since the 1980s, some authors have pointed to the connections between environmental problems, defense, and security (Ullman, 1983; Myers, 1989). Richard Ullman (1983) was one of the pioneers to argue that natural resources — such as drinking water, clean air, the ozone layer, and soil fertility — should be understood as security issues. According to the author, “Defining national security merely (or even primarily) in military terms conveys a profoundly false image of reality. (...) it causes states to concentrate on military threats and to ignore other and perhaps even more harmful dangers” (Ullman, 1983, p. 129). Such theoretical arguments would be corroborated by subsequent events, such as the chemical disaster in Bhopal in 1984 and the Chernobyl nuclear accident in 1986<sup>2</sup>.

However, it would only be in the post-Cold War context that “new threats” would more forcefully challenge the normative power of traditional security approaches (Krause, 1998; Buzan and Hansen, 2009). As a result, although the traditional and militarized view remains central to the present day — and is even reinforced by recent events such as the War in Ukraine — ISS are today configured as a plural field, marked by the coexistence of different theoretical currents, which includes broader analyzes of how events of a political, economic, social and environmental nature can affect the security of states, individuals and communities (Buzan *et al.*, 1998; Buzan and Hansen, 2009).

Mentioned theoretical innovations also reverberated to the political field, producing a growing understanding that national defense — understood as efforts dedicated to the preparation and use of military capabilities — would be one of the elements that make up the most comprehensive framework of security (Silva, 2022, p. 11). The tendency to multiply security and defense official documents that contemplate unconventional threats, whose resolution transcends merely military practices (Silva, 2022), can be understood as evidence of this new understanding.

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2. Considered the worst chemical disaster in history, the gas leak from a pesticide plant in Bhopal resulted in the death of about 25,000 people and reached around 600,000, affecting at least three generations of Indians (Giovannaz, 2020). The Chernobyl nuclear accident, a member of the Union of Soviet Socialist Republics (USSR) at the time, released high levels of radioactive material into the atmosphere, reaching not only the community located around the plant, but also other countries in Europe. There is significant controversy about the total number of victims of Chernobyl, mainly due to the difficulties of measuring the long-term effects of human exposure to radiation (IAEA, 2005). In both cases, high levels of air, soil and water contamination have led to countless deaths and irreversible damage to the health and rights of the affected populations. By illustrating the severity of environmental risks, these events also showed the insufficiency of traditional security approaches and practices to mitigate them, corroborating the arguments of authors such as Ullman (1983).

In Brazil, the National Defense Policy (PND for its acronym in Portuguese), the highest level document aimed at planning defense initiatives, defines national security as “the condition that allows the preservation of sovereignty and territorial integrity, the realization of national interests, despite pressures and threats of any nature, and the guarantee to citizens of the exercise of constitutional rights and duties” (Brasil, 2020a, p. 11, emphasis added). National defense, in turn, is conceived as “the set of attitudes, measures and actions of the state, with emphasis on military expression, for the defense of the National Territory, sovereignty and national interests against preponderantly external, potential or manifest threats” (Brasil, 2020a, p. 11).

Although these excerpts point to a broader and holistic conception of national security, Brazil has not yet carried out the movement to incorporate climate change into its guiding security and defense documents, such as the PND, the National Defense Strategy (END for its acronym in Portuguese) and the White Paper on National Defense (LBDN for its acronym in Portuguese). Such documents are extremely relevant as they consolidate a national understanding of how to provide for the security of the state and individuals, thus offering guidelines for public policies in these areas (Silva, 2022, p. 11). The updated version of the PND does not include more structuring considerations about climate challenge, limiting itself to recognizing that the “impacts caused by climate change or pandemics may have serious environmental, social, economic and political consequences, requiring a prompt response from the state” (Brasil, 2020a, p. 20). On the other hand, END and LBDN do not even refer to the phenomenon.

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The lack of mention of climate change in the texts of these high-level documents reveals some resistance on the part of defense institutions to give relevance to threats of an environmental nature, a trend that occurs not only in Brazil, but also in other countries in the region and the world (Santos *et al.*, 2022). With this, it is worth mentioning that there is no attempt here to defend the mere “securitization” (Buzan *et al.*, 1998) of climate change, so that they are simply included in the range of threats to Brazilian territory and sovereignty, thus demanding exceptional and militarized policies. Differently, it is believed that, given the severity of the climate and environmental crisis, it is necessary that considerations about climate risks be incorporated, in a negotiated, transversal, and integrated way, into the plans and strategies of the most diverse areas, including, however, not limited to, the sphere of defense. This process, which takes into account how climate change can trigger situations of insecurity in multiple areas, has been called by some experts as “climatization of public policies” (Mobjörk *et al.*, 2016) and it has been increasingly verified internationally.

Considering the fundamental role played by defense institutions not only in safeguarding the territory, sovereignty, and national interests, but also in guaranteeing the rights and security of the population, amid the current scenario of worsening environmental crisis, it is of paramount importance that the sector is part of this climatization process. Thus, it will be possible to deepen knowledge about how climate risks manifest themselves in the national territory in order to develop multidimensional strategies to better address them.

Before turning to the analysis of how defense institutions already contribute to national initiatives and policies in the environmental arena, the next section of this policy paper is dedicated to the presentation of a brief historical retrospective with the objective of shedding light on tensions, ambiguities and convergences verified in the country with regard to the preservation of the environment and the defense of sovereignty.

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## 2. Environment and Defense in Brazil: addressing contradictions and seeking convergences

Although national institutions linked to sovereignty have been acting in recent decades in support of Brazilian environmental policies, the relationship between the two spheres has not always been on a cooperative basis. From a narrow understanding of security, the preser-

vation of the environment was seen by representatives of the state and the Armed Forces not as a precondition for guaranteeing national and human security, but as a threat to territorial integrity and Brazilian national interests (Aguiar *et al.*, 2015). It was feared, in this sense, that Brazil's priceless natural wealth would arouse international greed, posing risks to national borders and the country's sovereign right to manage its natural resources autonomously, in pursuit of development (Lago, 2006; Aguiar *et al.*, 2015).

Therefore, there was an understanding that assuming cooperation commitments in the environmental arena would imply a decrease in national sovereignty (Lago, 2006; Aguiar *et al.*, 2015; Viola, 2004). The position defended by the Brazilian delegation during the United Nations Conference on the Human Environment (UNCHE), held in Stockholm in 1972, would be symptomatic of this understanding:

In the area of the use of natural resources, national interests are of such importance that any formula imposing a systematic consultation for development projects under the ecological pretext would simply be unacceptable to Brazil (Brasil, 1972, p. 9).

In the context of military dictatorship, the exploitation of natural resources and the settlement and greater integration of the Amazon with the rest of the national territory were pointed out as ways to promote development and strengthen border security (Franchi, 2013; Fagundes, 2019; Igarapé *et al.*, 2022). The attacks promoted by academics, international organizations and by some countries of the Global North on the risks of scarcity of natural resources were interpreted as deliberate attempts to curb development and reduce the sovereignty of the countries of the South, as evidenced by another fragment of the text of the Brazilian delegation's position in Stockholm:

(...) alarmist theses about a world with supposedly endangered resources constitute a permanent threat to those countries that have greater natural reserves, and it is no surprise that, in this context, certain efforts to internationalize the large virgin areas of the Earth acquire renewed significance (Brasil, 1972, p. 6).

This perception was reinforced by uncertainties regarding the methodological rigor and veracity of the conclusions presented by some of the reports that supported the negotiations. This was the case of the Club of Rome Report, entitled "Limits to Growth", which used neo-Malthusian assumptions and computer models to point to an apocalyptic scenario of resource depletion in the face of an exponential increase in the global population (Meadows *et al.*, 1972).

In the wake of concerns about maintaining its sovereignty in the face of external pressures, still in the 1970s, Brazil proposed the conclusion of the Amazon Cooperation Treaty between the South American countries that house the forest in their territories. Based on the Brazilian proposal, in 1978, Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela signed the treaty with a view to reaffirm the sovereign control of their forests and ensuring their preservation and the rational use of their natural resources (OTCA, 1978; Fagundes, 2019).

In the following decades, interpretations of environmental concerns were gradually transformed, both within society and among defense institutions. The democratization process, the strengthening of civil society organizations, the advancement of scientific studies and the consolidation of a federal structure of environmental governance favored these new perceptions and, above all, the approximation between these two sectors.

Thus, in 1985 was created the Ministry of Urban Development and Environment, the first dedicated to the subject in the country's history. During the Sarney government, in response to the international pressures suffered by Brazil due to the increase in fires in the Amazon, the "Our Nature" Program was launched, under the presidency of the National Defense Advisory Secretariat. The main objective of the initiative was to combat predatory actions in relation to the environment and to structure an environmental protection system at the federal level (Brasil, 1988). From these first structuring efforts, the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA for its acronym in Portuguese) and the first pro-

gram to combat fires and deforestation in the Amazon, the Emergency Program in the Legal Amazon were inaugurated (Teixeira, 2020, p. 20).

It would also be in this context, still during the Sarney government, that Brazil would launch its candidacy to host the United Nations Conference on Environment and Development, Rio-92, allowing the theme to enter the public debate in an unavoidable and definitive way. The Rio Conference represented a watershed, both with regard to the maturation of domestic debates on environmental problems and the consolidation of specific international regimes, through the inauguration of the Climate (UNFCCC), Biological Diversity (CBD) and Desertification (UNCCD) Conventions. At that time, Brazil signaled that it was willing to renounce its sovereigntist stance to place itself as a relevant interlocutor with regard to environmental agendas (Aguiar et al, 2015; Mattos *et al.*, 2022).

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### 3. The role of Armed Forces subsidiary operations in Brazilian environmental policies

The support of the Armed Forces to environmental policies is legally supported by Complementary Law No. 97<sup>3</sup> of 1999, which provides for the general rules for the organization, preparation, and use of Armed Forces. The same law also delimits its subsidiary attributions, understood as actions that contribute to national development and Civil Defense. In this sense, the Army, Navy, and Air Force are authorized to cooperate, within their specificities, with public agencies in the implementation and inspection of compliance with laws and in the repression of cross-border and environmental crimes, including deforestation, land grabbing, illegal logging and illegal mining.

As a ground force, the Brazilian Army acts directly in border patrols and provides logistical, intelligence, communications, and instructional support for the repression of environmental crimes (Brasil, 2020c, p. 74). The Navy, in turn, has as one of its subsidiary functions to implement and supervise compliance with laws and regulations at sea and inland waters (Brasil, 2020c, p. 54). In cooperation with other federal agencies, the Navy also coordinates the Blue Amazon Management System (SisGAAz for its acronym in Portuguese), which facilitates the identification of environmental infractions and the articulation of prompt response actions. The Air Force assumes an essential function regarding the control of Brazilian airspace, in addition to providing support to federal agencies in the repression of crimes involving the use of airspace and airport areas (Brasil, 2020c, p. 88). In the Amazon region, the Air Force has been working to identify and destroy clandestine airstrips, constantly used by individuals involved in illegal mining and drug trafficking (Brasil, 2017, p. 23).

It is also worth mentioning the very important role of the Operations and Management Center of the Amazonian Protection System (Censipam for its acronym in Portuguese), linked to the Ministry of Defense, with regard to monitoring deforestation and other illegalities and monitoring extreme natural events, such as rising river levels, fires and precipitation. By conducting research, carrying out risk monitoring and integrating and sharing information with other agencies, Censipam contributes to the improvement of the region's management. Based on the Amazon SAR project, whose resources come from the Amazon Fund, Censipam developed a monitoring system capable of mapping the terrain even in adverse weather conditions, in order to complement the data mapped by other institutions, such as the National Institute for Space Research (INPE for its acronym in Portuguese), generating more accurate deforestation alerts for inspection bodies, such as IBAMA and the Chico Mendes Institute for Biodiversity Conservation (ICMBio for its acronym in Portuguese) (Brasil, 2021).

In addition to border monitoring, naval patrolling, airspace control and intelligence support, the Armed Forces also performs humanitarian support functions with remote communities,

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3. Law No. 97, of June 9, 1999, was amended by Complementary Law No. 117/2004, and by Complementary Law No. 136/2010.



**“Due to their capacity for prompt mobilization and their capillarity throughout the national territory, the Armed Forces also provide essential support to agencies and entities related to Civil Defense. Support can occur both with regard to preventive actions — such as planning, instructions, and simulations — and in disaster situations — whether of natural origin or caused by human action — in order to mitigate their effects, preserve the well-being of the population and restore social normality (Brasil, 2015, p. 15).”**

**“In the literature on security, there are significant divergences regarding the potential connections between climate change and the outbreak of violent conflicts (Mobjörk et al., 2016; Abdenur et al., 2019). (...) On the other hand, the evidence about the risks posed by climate change to human security and the capacities of states to guarantee public goods for their population is much less controversial (IPCC, 2022).”**

advising on the logistics of food supplies and medicines, medical and dental care, and the provision of basic services in the areas of education, infrastructure, and communication (Igrapé *et al.*, 2022, p. 16). In this sense, it is worth mentioning the role of Operation Acolhida in receiving and assisting Venezuelan refugees who arrive in Brazil from the border of Roraima. The Operation is a task force promoted by the Federal Government and, since 2018, has the integrated action of members of the Armed Forces, federal servants and employees of international organizations and civil society. Still with regard to the participation of the Armed Forces in subsidiary humanitarian support operations, Operation Yanomami stands out, triggered by the Ministry of Defense after the publication of Decree No. 11.405, of January 30, 2023, with the scope of addressing the public health emergency experienced by the Yanomami population and combating illegal mining on their lands. Regarding this operation, the Armed Forces provided logistical support to other federal agencies to ensure the transportation of food and medicines and the care of indigenous populations (Brasil, 2023b).

Due to their capacity for prompt mobilization and their capillarity throughout the national territory, the Armed Forces also provide essential support to agencies and entities related to Civil Defense. Support can occur both with regard to preventive actions — such as planning, instructions, and simulations — and in disaster situations — whether of natural origin or caused by human action — in order to mitigate their effects, preserve the well-being of the population and restore social normality (Brasil, 2015, p. 15). Among these operations, the performance of the Armed Forces in forest firefighting operations throughout the national territory stands out, offering logistical support to brigade members and firefighters (Brasil, 2017, p. 23), in serving the population of Petrópolis, affected by severe rains and landslides in the summer of 2022, and in helping communities isolated by the drought of rivers in the Amazon, in September and October 2023. The Armed Forces were also called to work recently in Rio Grande do Sul, after the heavy rains that hit several municipalities in the state. Among the main functions performed by the Navy, Army, and Air Force in the context of these disaster scenarios are the rescue of victims, medical evacuations, the transportation of homeless people and the distribution of drinking water (Brasil, 2023c).

It is essential to note that, in view of the increase in global temperature, extreme natural phenomena tend to manifest themselves more frequently and protractedly (IPCC, 2022), thus requiring the creation of new adaptation strategies aimed at different sectors, including defense. Considerations on how the deepening of the ecological crisis tends to reflect in this area, thus affecting national security and defense, will be presented in the next section.

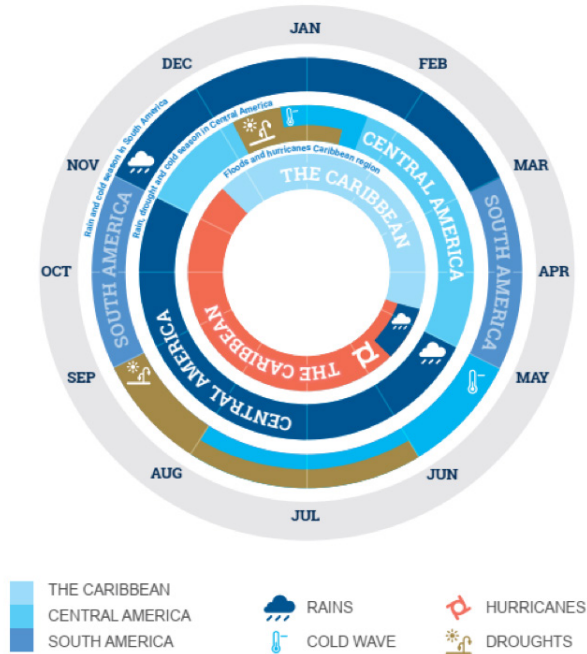
#### **4. The worsening of the climate crisis and the possible implications for security and defense in Brazil**

In the literature on security, there are significant divergences regarding the potential connections between climate change and the outbreak of violent conflicts (Mobjörk *et al.*, 2016; Abdenur *et al.*, 2019). Reports from international organizations and official security documents tend to adopt the more cautious position recommended by the Intergovernmental Panel on Climate Change (IPCC, 2022) that, added to other destabilizing factors, climate effects can play a relevant role in the context of pre-existing hostilities, not placing themselves in isolation as the cause of conflicts. On the other hand, the evidence about the risks posed by climate change to human security and the capacities of states to guarantee public goods for their population is much less controversial (IPCC, 2022).

Since the 2000s, extreme natural disasters have affected more than 190 million people in Latin America and the Caribbean (UNDDR, 2023). The latest report published by the World Meteorological Organization indicates that climate change is triggering a vicious cycle of extreme events in this region, with spiraling effects for governments and local communities (WMO, 2023). The data indicate that extreme heat, combined with prolonged droughts, has fostered fire records in these countries and, as a consequence, GHG emissions have reached the peak

of the last twenty years (WMO, 2023). Emissions were enhanced by the drought scenario, which led to a reduction in electricity production from hydroelectric plants, thus generating an increase in the demand for fossil fuels. The publication also highlights the importance of expanding the coverage of early warning systems, since, according to 2020 data, they would reach only 60% of the Latin American and Caribbean population (WMO, 2023).

Figure 1. Extreme Natural Phenomena in the Caribbean, Central and South America



Source: OCHA, 2020, p. 3.

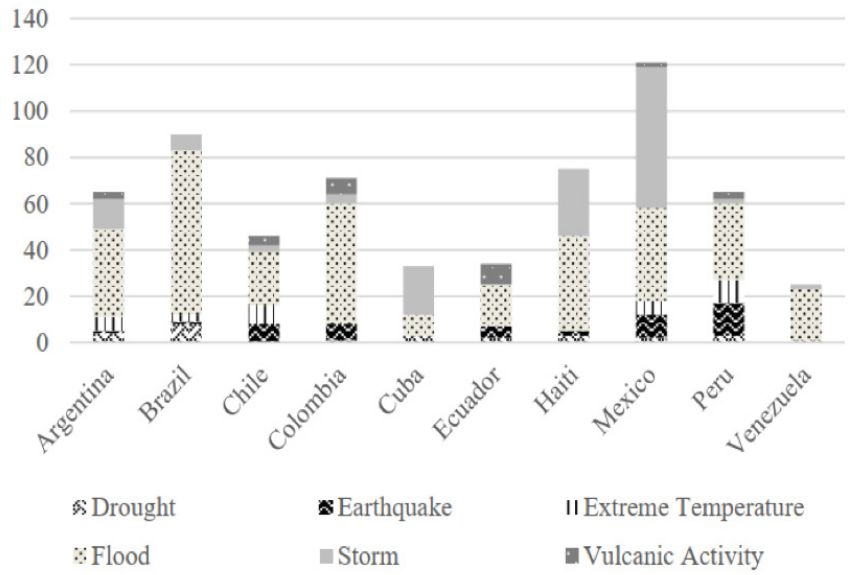
**“...it is imperative to reflect on the interactions between environmental challenges and the defense sector based on two distinct but complementary logics: on the one hand, it is necessary to reinforce the role of national defense in supporting climate mitigation and adaptation initiatives, on the other hand, it is essential that research and analysis be conducted on how short, medium and long-term climate effects may have an impact on the defense infrastructures and the operability of the Brazilian Armed Forces.”**

In this scenario of multiple insecurities, it is imperative to reflect on the interactions between environmental challenges and the defense sector based on two distinct but complementary logics: on the one hand, it is necessary to reinforce the role of national defense in supporting climate mitigation and adaptation initiatives, on the other hand, it is essential that research and analysis be conducted on how short, medium and long-term climate effects may have an impact on the defense infrastructures and the operability of the Brazilian Armed Forces.

With regard to the support granted by the Armed Forces to the Civil Defense, given the tendency for extreme natural events to occur more frequently, some authors have been pointing to the phenomenon of “militarization of disasters” (Boeno, 2018, p. 175). When analyzing the cases of Ibero-American countries, including Brazil, Raul Boeno (2018, p. 179) asserts that because Armed Forces are constituted from the logic of hierarchy and discipline, they tend to be progressively demanded to counteract the scenario of disorder resulting from these tragedies. The researcher also highlights the perception of some actors linked to the defense sector that the militarization of disasters may compromise the operational capabilities of the Armed Forces, in order to demand greater involvement of the military with the theme (Boeno, 2018, p. 179). Regarding not only responses to these phenomena, but also disaster prevention, it would also be essential to enhance cooperation between military and civilian research institutions, aiming at improving risk mapping and greater coordination between alert and monitoring systems.



**Figure 2.** Incidence of extreme natural events in Latin American countries from 2000 to 2019

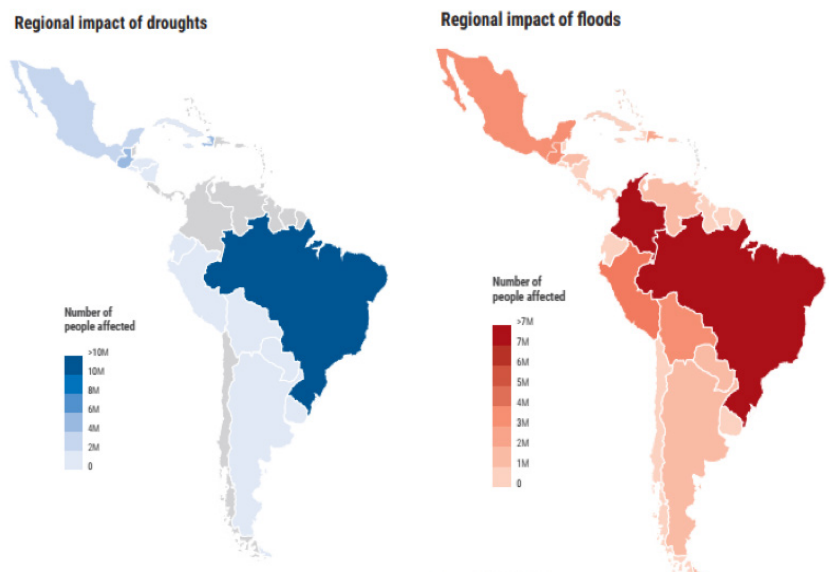


Source: Santos *et al.*, 2022, p. 288, based on data from The International Disasters Database, 2020<sup>4</sup>.

“...it is essential to highlight how climate change transforms the environment in which the Armed Forces operate, generating multiple challenges with regard to their priority and subsidiary functions.”

In addition, it is essential to highlight how climate change transforms the environment in which the Armed Forces operate, generating multiple challenges with regard to their priority and subsidiary functions. Transformations in river courses and prolonged droughts tend to hinder the mobility of military units, generating difficulties in patrolling operations and combating illicit acts, as well as additional obstacles to ensure the service of populations in remote areas (Santilli, 2020). The worsening of the climate scenario in the Latin American context can also increase migratory flows to Brazil, derived mainly from countries that have greater environmental and social vulnerability, in addition to intensifying forced internal displacement (IPCC, 2022; Cason, 2011). Both scenarios require the consolidation of strategies and public policies capable of ensuring the reception and proper reception of these populations.

**Figure 3.** Regional impacts of droughts (Graph 1) and floods (Graph 2) according to the number of people affected in the period from 2000 to 2022



Source: ODDR, 2023, p. 14.

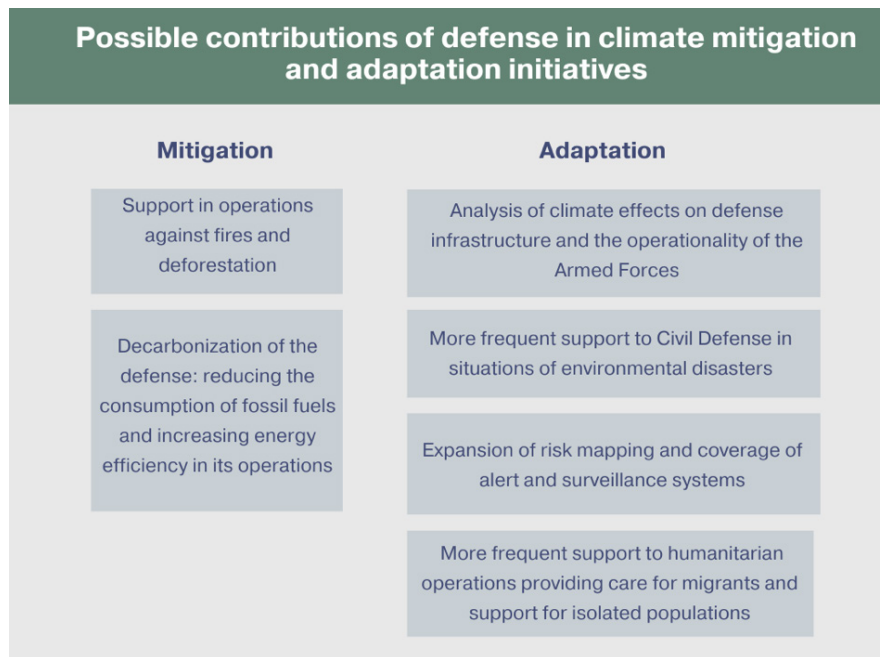
4. The y-axis refers to the number of extreme natural events reported in Latin American and Caribbean countries in the period between 2000 and 2019.

**“Considering Brazil’s vulnerability to these disasters, the different characteristics of its regions and biomes and the way its military assets are distributed throughout the national territory, it would be of paramount importance to conduct comprehensive studies and research capable of measuring the vulnerability of the defense sector to climate risks...”**

The rising levels of the Atlantic Ocean (WMO, 2023) will also result in additional challenges for the Navy and Civil Defense, in view of the worsening consequences of undertows, the trend of flooding and erosion of coastal areas and the impacts on essential infrastructures, such as military installations themselves (Santilli, 2020; Abdenur, 2019). Unfortunately, these are not long-term forecasts, but a reality that is already manifested in different countries around the world, including Brazil. In 2017, a storm hit the Army Aviation Command in Taubaté, resulting in serious damage to an aircraft and two helicopters (Abdenur, 2019; fan, 2017). According to a Pentagon report released in 2018, about 50% of the 3,500 military bases in the United States have already been affected by extreme natural events or other climatic risks (USA, 2018). Considering Brazil’s vulnerability to these disasters, the different characteristics of its regions and biomes and the way its military assets are distributed throughout the national territory, it would be of paramount importance to conduct comprehensive studies and research capable of measuring the vulnerability of the defense sector to climate risks, and, based on these conclusions, develop strategies to make Brazilian defense assets more resilient to growing climate and environmental challenges.

The Armed Forces also play a decisive role in climate change mitigation initiatives. This is due to the profile of national GHG emissions, which comes mainly from the land use and change sector (LULUCF). In this sense, the support granted by defense institutions to other federal and state agencies in activities to prevent, monitor and combat deforestation and fires acquires even more significant relevance, as evidenced in the previous section.

**Figure 4.** Possible contributions of defense in climate mitigation and adaptation initiatives



Source: the author.

Another possible contribution of Brazilian defense to the reduction of national emissions would be the decarbonization of the sector, a process that has been internationally called “greening defense” (EEAS, 2022). This consists of reducing the consumption of fossil fuels in military installations and increasing the energy efficiency of their operations. Launched in 2017, the Brazilian Defense Green Book already pointed to the need for the Armed Forces to use energy in a sustainable way and presented specific examples of how sources of renewable origin are used in some military units. In view of the energy crisis triggered by the Russian invasion of Ukraine, the reduction of dependence on fossil fuels in the area of defense has already been addressed as a priority theme by the European Union (EEAS, 2022; EU, 2022) and the North Atlantic Treaty Organization (NATO, 2021).

Despite the announced efforts, an important gap persists with regard to the accounting of GHG emissions from the defense sector. The UNFCCC does not oblige parties to report emis-

**“Despite the announced efforts, an important gap persists with regard to the accounting of GHG emissions from the defense sector. The UNFCCC does not oblige parties to report emissions from military activities in their national inventories.”**

sions from military activities in their national inventories. Such emissions result from the consumption of fuels by land, water, and air vehicles, from the energy consumed in military installations and from the dynamics arising from conflict scenarios. The gap was already present in the text of the Kyoto Protocol and remained unchanged during the negotiations of the Paris Agreement, arguing that the publication of these data could pose risks to the national security of the signatory parties. Estimates indicate that, together, emissions from the defense sector should represent about 5.5% of the global total (Conflict and Environment Observatory, 2023). The omission of hundreds of thousands of tons of carbon from the Global Stocktake, considered by the Climate Convention as a key inventory to measure the efforts needed to contain the rise in the planet's temperature, has been noted with concern by academics and civil society organizations, who are pushing so these numbers might be transparently reported. In its fourth national communication to the UNFCCC, Brazil made no mention of its emissions from the defense sector, and the National Emissions Registry System (SIRENE for its acronym in Portuguese) also does not include data on this contingent.

It is also worth mentioning that the necessary energy transition to a world less dependent on fossil fuels could result in a race to exploit rare earths elements and strategic minerals, essential supplies for the production of batteries, wind turbines, solar panels, and electric cars. Estimates by the International Energy Agency indicate that to ensure the Paris Agreement's goal of keeping the planet's temperature rise below 2°C, demands for critical minerals tend to quadruple by 2040 (IEA, 2022). The geopolitical relevance of these minerals becomes even more significant as such resources integrate the production chains of the most advanced military technologies, leading countries such as Australia, the United States of America (USA) and China to point to them as essential to national security (Pope and Smith, 2023).

Brazil is a country rich in minerals and rare earth elements. In its territory, it is found 94% of niobium, 22% of graphite and 16% of nickel from around the world (Igarapé, 2023). The country also has the third largest reserve of rare earth elements on the planet, behind only China and Vietnam (US Geological Survey, 2021). In view of the growing demands for these minerals, special attention must be paid to the social and environmental challenges and risks involved in the process of exploiting these resources. Thus, it is essential that setbacks and flexibilities are not allowed in national legislation, so that the autonomy of environmental agencies for the issuance of exploration licenses and for the monitoring and inspection of operations is guaranteed. Also, it is of utmost importance that the right to prior, free, and informed consultation of indigenous and traditional communities is safeguarded, as stipulated by Convention No. 169 of the International Labor Organization (ILO), and that exploration projects provide for broad socio-environmental safeguards, based on technical opinions, in order to reduce possible impacts and risks to local communities and ecosystems.

**“Considering the fundamental support that the Brazilian Armed Forces have been offering (...) to operations to combat deforestation, in response to extreme natural disasters and in the reception of migrants, subjects which are not considered as priorities for defense, but that are deeply linked to climate mitigation and adaptation strategies, it appears that the links between climate change, national security and human security become even more intricate in Brazil.”**

## 5. Final considerations and policy recommendations

In the current context, climate change can be considered a threat even by those who tend to advocate a more restricted and state-centric view of security. This is because climate effects already affect the territorial integrity of states, access, and availability to their natural resources, in addition to compromising essential infrastructures for the defense and operation of Armed Forces. On the other hand, the risks posed by climate change to human security are even more potent, in the face of the intensification and multiplication of extreme natural phenomena, the worsening of food and water insecurity and the proliferation of new viruses. In this sense, climate change has been addressed, both in the literature and in the political sphere, as a multidimensional threat, whose effects are imposed on the security of several subjects in a differentiated way.

Considering the fundamental support that the Brazilian Armed Forces have been offering, in addition to their constitutional attributions to operations to combat deforestation, in response to extreme natural disasters and in the reception of migrants, subjects which are not

considered as priorities for defense, but that are deeply linked to climate mitigation and adaptation strategies, it appears that the links between climate change, national security and human security become even more intricate in Brazil. Turning to the convergences between national defense and environmental policies, this policy paper endeavored to shed light on these links and point, albeit incipiently, to the possible challenges and risks that tend to emerge in such a scenario of deepening ecological crisis.

From the data and analyzes presented throughout this study, it was possible to make the following policy recommendations addressed to Brazilian decision makers:

**I) Promotion of the “climatization” of national public policies, including the Defense sector:**

In view of the multidimensional nature of climate risks, it is recommended to integrate climate mitigation and adaptation initiatives into the sectoral policies of several areas, including national defense.

The inclusion of climate change and environmental challenges in the text of high-level documents — such as the National Defense Policy, the National Defense Strategy, and the White Paper — would represent a crucial movement inasmuch as the guidelines that will serve as the basis for public policies in the area of defense come from them. This movement would also contribute to promoting greater transparency for society regarding the way defense institutions understand climate change and prepare to respond to its challenges.

**II) Diagnosis of the vulnerability of defense infrastructures and the operability of the Brazilian Armed Forces in the face of growing climate risks:**

Considering that the deepening of the climate crisis may pose risks to Brazilian defense infrastructures and the operability of the Armed Forces, it is recommended to promote research and scientific studies, through the partnership between military and civilian study centers, aiming to diagnose the vulnerability of Brazilian defense assets. These results may serve as inputs for the elaboration of more comprehensive strategies and initiatives that seek to increase the resilience of the sector in the face of the challenges imposed by environmental phenomena.

**III) Encouraging cooperation with research and defense institutions in other South American countries, aiming to improve alert and monitoring systems and add efforts to combat environmental crimes:**

In view of the porosity of national borders to climate effects, it is essential that the issue is addressed collaboratively among the countries of the region. During the last ACTO summit, held in August 2023, representatives of Amazonian countries pledged to combine efforts to combat deforestation and other illegal activities and to promote the sustainable development and social inclusion of their peoples. The content of the summit's final declaration can be considered an important milestone in driving these cooperation initiatives forward. However, the next stage concerns the consolidation of concrete initiatives, the elaboration of which will require the effective participation of civil society, traditional communities and agencies operating in this region, including defense institutions.

A possible contribution of the sector in this sense would be the approximation with the defense and research institutions of other Amazonian countries, seeking to expand the reach of alert and monitoring systems, deepen knowledge about how climate change manifests itself in these territories and how they reverberate in the performance and operation of the Armed Forces. In this way, it will be possible to outline joint strategies to address common challenges and thus contribute to the security and climate mitigation and adaptation objectives of these countries. ■

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