

# Climate change as a complex threat in the Zone of Peace and Cooperation of the South Atlantic

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## Executive summary

Complex Threats<sup>2</sup> are a concept under construction, but there is some consensus on their unpredictability, wide reach, and fluidity, establishing an immediate nexus with climate change. Strategic study centers and Euro-American think tanks conduct the conceptual construction process, such as the William J. Perry Center for Hemispheric Studies, linked to the Department of Defense (DoD) of the United States of America (USA). Threat is the representation of a risky situation for those who perceive it. Carl Schmitt (1984) defined “enemy” as one who threatens our existence. The Brazilian Navy’s Strategic Planning (PEM-2040 for its acronym in Portuguese) already establishes “environmental issues and natural disasters” as a threat to sovereignty. Therefore, it does not seem possible to exclude the theme of climate change from this approach, and this policy paper intends to relate this “new threat” to the political choice of the Brazilian state, which established the South Atlantic as its strategic environment, where the Zone of Peace and Cooperation of the South Atlantic<sup>3</sup> (ZOPACAS) is its cooperation framework. It is also proposed to investigate its relationship with the Defense and protection of the Blue Amazon, through a brief analysis of the mitigating actions carried out, especially by the Armed Forces, with the leadership of the Brazilian Navy (MB for its acronym in Portuguese), and the possible prospects for future transformations by 2040.

At the end, there are some recommendations to expand the monitoring and multidisciplinary research of marine biomes; to sign specific technical agreements in ZOPACAS; to support the project of the Brazilian conventional nuclear-powered submarine as a carbon neutralizer; to exchange experiences between South American and African ports in ZOPACAS; to maintain support for the increase in capacities of African naval forces, as well as the creation of the South Atlantic whale sanctuary; and to evaluate the increase in the insertion of climate considerations in strategies, planning and decision-making processes in the Defense sector.

## KEYWORDS

Climate Change; ZOPACAS; South Atlantic; Mindelo Declaration; Security and Defense.

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3. Forum comprised of South Africa, Angola, Argentina, Benin, Brazil, Cape Verde, Cameroon, Congo, Ivory Coast, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Equatorial Guinea, Liberia, Namibia, Nigeria, Democratic Republic of Congo, Sao Tome and Principe, Senegal, Sierra Leone, Togo, and Uruguay.

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## 1. Climate Change, ZOPACAS and Mindelo Declarationo

The United Nations Conference on the Human Environment, held in Stockholm (1972), set the starting point for a new type of development. By seeking to reconcile economic development, ecological prudence and social justice, the Final Declaration planted the seed of environmental public policies in the Member States, raising the level of discussion on the subject (Lago, 2006).

Two decades later, the United Nations Conference on Environment and Development (UNCED), known as “Rio-92” or “Earth Summit”, addressed the environmental issue in the public arena in an unprecedented way (Hogan, 2007), resulting in the publication of Agenda 21, a cornerstone in the dissemination of the idea of sustainable planning. This event also raised Brazil’s status as a relevant actor in the International System in environmental issues.

With the evolution of the discussions, climate change began to be inserted in the agendas of the states as an unconventional and difficult to measure threat, as it cannot be neutralized by the use of conventional Westphalian resources. The environmental impact also makes it difficult to identify the authorship and intentionality of the offense, in addition to imposing its risks for indefinite periods of time and in large areas, such as the South Atlantic Ocean. Despite this rise of the environmental issue as a protagonist, also in academic studies, in national strategic plans and statements by international organizations, establishing a clear link between climate change and Defense remains a challenging task. It is pointed out here that a Complex Threat normally requires Defense planning and actions.

Over the last three decades, climate risks have gradually required a significant part of the governments of relevant states, democratic or not, to securitize<sup>4</sup> the issue. It is no coincidence that the President of the United States of America (USA), Joe Biden (2021-2024), stated at the opening of the Climate Leaders Summit (New York, 2021) that this is the decisive decade to avoid an environmental cataclysm. The Secretary-General of the United Nations (UN), António Guterres (2022), during the 27th United Nations Climate Conference (COP-27), said that this would be the issue that defines our era, as well as the central challenge of our century, reaffirmed at the opening of the 78th session of the UN General Assembly (UNGA), that “we need to be determined to face the most immediate threat to our future: the overheating of our planet” (Guterres *apud* ONU, 2023). Therefore, the leadership of the environmental issue is a difficult process to contest and probably irreversible in the coming decades, regardless of the questions to this narrative.

The elevation of issues once considered low politics to high politics ends up politicizing such spaces, especially of peripheral coastal states, in which human security and the responsibility to protect end up being used, not with the character of universality that these instruments were created, but in favor of an alleged international security that could aim at the control of natural resources to foster developments, not always sustainable, of hegemonic blocs or revisionist powers.

The President of Brazil, Luís Inácio Lula da Silva (2023-2026), in the opening speech of the 78th session of the UN General Assembly (UNGA), stated that the gravity of the climate crisis is knocking at our doors, destroying our homes, our cities, our countries, killing and impos-

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4. In a brief definition: when state actors politicize a subject for considering it a threat to the state survival (Buzan and Waever, 2003).

ing losses and suffering on our brothers, especially the poorest, and that, therefore, acting against climate change implies thinking about tomorrow and facing historical inequalities (Lula *apud* ONU, 2023).

Climate change can be considered a risk multiplier<sup>5</sup>, a Complex and liquid Threat, and significantly more palpable in terrestrial biomes. In this comparison, ocean isolation is only stopped when public opinion is fueled by impactful scientific images or data. However, it is necessary to focus on maritime issues. The oceans are the vectors of wealth produced by humanity, since more than 95% of national trade flows through the sea (Beirão *et al.*, 2022), extension of sovereign national territories, a large fluid bank of the Blue Economy<sup>6</sup>, a source of subsistence for diverse populations, a net mass that helps maintain balance in the environmental cycles essential to the Planet, and at the same time, a liquefied desert on the high seas, whose seabed is defined as “the Area”. Thus, it can be said that even the United Nations Convention on the Law of the Sea (UNCLOS), and the entire framework of the conventions that preceded and structured it, are not sufficient to fully determine the rights and duties of coastal states and transatlantic states that aspire to some type of exploration and have the capacity and technology to carry out such an enterprise.

The Blue Amazon Concept<sup>7</sup> was one of the successful strategies of the Brazilian state to convince opinion makers, decision-makers, and the general public of the importance of the part of the Atlantic Ocean under national jurisdiction (Lemos Júnior, 2008). According to Admiral Ilques Barbosa Junior (2018):

Oceanopolitics involves the state as a central element for the adoption of sovereign decisions, considering the oceanic spaces, on the fate of its population, as well as in power relations with other states and, considering the international political-strategic conjuncture, with the other actors of international relations (Barbosa Júnior and More, 2012, p. 233).

The Blue Amazon would therefore be the main product of the Brazilian Oceanopolitics idealized by the Brazilian Navy.

However, in the context of the geopolitical space of the South Atlantic, the challenges are even greater. Establishing efficient public policies with transnational reach could be an important object of study, monitoring, and evaluation, considering that Declarations<sup>8</sup> resulting from high-level meetings do not necessarily establish a direct relationship with the feasibility of these policies. Alternatively, such Declarations should have the purpose of positioning the oceanic space as a true forum for the knowledge and development of the states in its surroundings, in the most harmonious, practical, and multilateral way possible.

In the search to establish an area of South-South reciprocal support, the definition of South Atlantic in Brazil's Defense documents denotes the special peculiarity of covering part of the northern hemisphere, up to latitude 16°N<sup>9</sup>, in order to insert all partner states on the western coast of Sub-Saharan Africa, especially Senegal. This vision is directly related to and materialized by the creation of the Zone of Peace and Cooperation of the South Atlantic Forum (ZOPACAS) in 1986, through Resolution No. 41/11 of the United Nations General Assembly (UNGA), which is an initiative of Brazil and supported by Argentina, after the “Falklands War”<sup>10</sup> (1982), with an opposing vote by the USA and abstentions from the main countries of the European Union (EU). According to Lemos Júnior (2014), in the 1980s, the South Atlantic was in

5. In 2019, the United Nations Security Council discussed the issue, concluding that the relationship between climate-related risks and conflict is complex and often permeates political, social, economic, and demographic factors.

6. The oceans' contribution to the economy and the need to ensure environmental sustainability.

7. Political-strategic concept, in light of the rights and duties established in the 3rd United Nations Convention on the Law of the Sea (UNCLOS III), with 4 aspects: sovereignty, scientific, environmental, economic.

8. The Declaration of Montevideo (2013), the result of the VII ZOPACAS Ministerial Meeting, was not executed.

9. See the figure of PEM-2040, pp. 18 (Marinha do Brasil, 2020).

10. Conflict between Argentina and the United Kingdom in the dispute over the Falklands or Malvinas Islands, also known as the “South Atlantic War”, where Brazil adopted imperfect neutrality, unofficially supporting Argentina.

the context of Hemispheric Security, defined and led by the USA, in a bipolar world, in the last phase of the Cold War. Therefore, the creation of a new geopolitical space defined and led by Brazil could be seen as a threat to the status quo of the Western alliance represented by the North Atlantic Treaty Organization (NATO).

Between continuity lapses, defined by Saraiva (2012) as “Atlantic Silences”, no permanent organizational structure, and occasional ZOPACAS strengthening initiatives, in July 2021, UNGA Resolution No. 75/312 brings a breath of fresh air that interrupts the longest interval between ministerial meetings of the forum. Thus, Cape Verde reassumes the responsibility of hosting the next meeting, pending since 2015, with the support of Brazil. Internally, the process conducted by the Brazilian Ministry of Foreign Affairs (MRE for its acronym in Portuguese) had the significant and necessary support of the Brazilian Ministry of Defense (MD), which created, in 2022, a specific Coordination for ZOPACAS that began to work in partnership with the Division of the Sea, Antarctica and Space (DMAE for its acronym in Portuguese) of the MRE. Finally, in April 2023, the VIII ZOPACAS Ministerial Meeting took place in Mindelo, on the Island of São Vicente, Cape Verde, a member country that started to hold the Presidency *pro tempore* of the Forum, exceptionally in the 2023-2026 triennium. At the time, Brazil had its application approved and will thus replace Cape Verde later, being also responsible for creating the Contact Points Office based in Brasília-DF (ZOPACAS, 2023).

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The main product of the aforementioned ministerial meeting was its awaited final consensus document, the Mindelo Declaration and its respective Action Plan. As a modern document and connected with the new threats, the current Declaration (2023) maintains the main resolutions of the Montevideo Declaration (2013) and places environmental issues at the center of the discussions in ZOPACAS, incorporating sensitive topics such as Oceans and Marine Resources, and Climate Change, in addition to the traditional ones, Research, Security and Defense.

In its item 12, the aforementioned document reaffirms that the Zone should be a forum for the development of cooperation between its Member States in areas such as maritime domain awareness<sup>11</sup>, science and technology, education, training, coastal surveillance, environment, public security, defense, strengthening of national institutions, trade, sport, tourism, economy, communications, transport, culture and political dialogue, recalling the strong potential that the South Atlantic presents for the socioeconomic development of the Member States of the Zone (ZOPACAS, 2023). In addition, out of a total of 140 items, nineteen are dedicated to Sustainable Development and Climate Change, and a further five items are in the Oceans and Marine Resources section. We highlight item 112, which reaffirms that climate change is one of the greatest challenges of our time, underlining the importance of fully implementing the commitments made under the United Nations Framework Convention on Climate Change (UNFCCC) and its instruments, including the Paris Agreement; item 115, which welcomes the Brazilian bid to host COP-30 in 2025; and item 116, which highlights the importance of strengthening cooperation in the implementation of the Convention on Biological Diversity and its Protocols (ZOPACAS, 2023).

Items 119 to 123 talk about the relevance of the commitments on oceans and seas made at the United Nations, namely at the 1st and 2nd UN Ocean Conference - UNOC (New York, June 2017 and Lisbon, June 2022, respectively) in preparation for the 3rd UNOC (France, 2024); welcomes the new global agreement-BBNJ (Biodiversity in Areas Beyond National Jurisdiction), by providing stronger protection of marine biodiversity in the High Seas; in addition to citing the 1st Session of the Intergovernmental Negotiating Committee (INC-1) to develop an internationally binding instrument on plastic pollution in the marine environment, which took place in Uruguay in 2022.

With this, it can be said that the Mindelo Action Plan, Annex I of the Declaration, is consistently aligned with the concept of Oceanopolitics<sup>12</sup> (Barbosa Júnior and More, 2012).

11. Concept established by the International Maritime Organization (IMO) as the effective understanding of any factor associated with the maritime domain that may impact safety, security, economy or the environment.

12. As Geopolitics refers more to terrestrial aspects, Oceanopolitics would have an oceanic perspective on power relations.

**Figure 1.** Annex I of the Mindelo Declaration, its Action Plan has 10 Sections

Source: Author's elaboration.

Item 2 of Section II indicates “studying and addressing environmental factors that affect marine ecosystems, including adverse impacts of climate change and ocean acidification and coastal erosion” (ZOPACAS, 2023). It seems to synthesize the theme of environmental issues in the forum, since the issue of illegal, unreported and unregulated (IUU) fishing also impacts the balance of the marine biome in the South Atlantic, going beyond the Blue Economy and food security. Such studies would be essential for the creation of a cooperative climate defense strategy based on mitigation and adaptation actions, considering the unpredictability, wide reach, and fluidity of a complex threat.

## 2. The South Atlantic biome under attack

Starvids (2017) states that the oceans are the largest crime scene on the planet, when analyzing three acute global threats: piracy, overfishing and the environmental issue. Under the prism of slow violence<sup>13</sup>, the biome is under attack.

Among the issues already mentioned, some other factors impacting the local marine biomes are added, which will be addressed in this section: invasive exotic species<sup>14</sup>, inserted through the ships' ballast water<sup>15</sup>; the increase in the temperature of the South Atlantic; in addition to the indiscriminate hunting of whales in this region.

13. Slow-destroying violence that disperses in time and space, a violence of attrition that is not normally seen as violence.

14. The name “exotic species” is designated to that which is outside its natural area of distribution and may have been introduced by man.

15. Seawater used to give stability to ships during navigation, introduced at the port of exit, which must be replaced at sea, eliminating exotic species accidentally captured.

In Brazil, three invasive species can be highlighted today, introduced by irregular ballast water, with impacts already measured in national aquatic biomes. The lionfish that adapts easily to any climate and environment; the orange cup coral that endangers ecological sanctuaries with a great diversity of corals such as Abrolhos; and the golden mussel that has a great capacity for encrustation and propagation. Despite the permanent surveillance of the Port Authority of the Brazilian Navy, ballast water is difficult to inspect, which could be reinforced in case of better coordination between the ports of departure and destination of the ships.

The case of whaling in the region is also relevant. In 1998, the International Whaling Commission (IWC) proposed the creation of the “South Atlantic Whale Sanctuary”, trying to materialize a multilateral partnership, focusing on environmental governance. From 2001, Brazil became one of the leaders of the IWC election, which was incorporated into the state environmental policy in Brazil, being defended by the management of Itamaraty and the Ministry of the Environment (MMA for its acronym in Portuguese) in the last two decades (Menegasi, 2022). During the 68th IWC meeting in Slovenia in October 2022, seventeen member countries, including Benin, Liberia, Ghana, Côte d’Ivoire and Guinea, all members of ZOPACAS, abandoned the meeting and again prevented the creation of the sanctuary. As top predators and carbon accumulators, whales are essential for balancing the ecological cycles of the oceans, especially the South Atlantic, where the flow of ocean currents would already be at risk.

GOOS-Brazil<sup>16</sup> is the national ocean observation system aiming at the collection, quality control, operational distribution of data and oceanographic and climatological monitoring in the South and tropical Atlantic, coordinated by the Brazilian Navy Hydrography Center. The Brazilian Navy also supports the SAMBAR project<sup>17</sup>, led by USP (University of São Paulo), whose objective is to detect changes in the oceanic circulation of the South Atlantic, which has a direct effect on the planet’s climate system. Considering the Blue Amazon and ZOPACAS, this circulation can affect precipitation patterns in Brazil, Argentina, and Uruguay, impacting agriculture and the supply of water for consumption and for industry and the energy sector. The role of the South Atlantic is believed to be increasingly clear in this cycle, since its surface circulation would control the amount of salt and heat transported to the North Atlantic; in addition, by influencing the mass of water arriving in the North Atlantic, it impacts the functioning of the global thermohaline circulation (Barnez, 2019).

Theoretical physicist Peter Ditlevsen and statistical mathematician Susanne Ditlevsen, linked to the University of Copenhagen, published an article in the journal *Nature Climate Change* (2021), pointing out that an important pattern of circulation of the waters of the Atlantic Ocean, on which the capital task of regulating part of the planet’s climate would fall, could collapse before the end of the century. They refer to the system of ocean currents known as the Atlantic Meridional Overturning Circulation (AMOC)<sup>18</sup>, which already has lower speed and resilience (Boers, 2021), that is, there is a record of loss of dynamic stability. Campos (2023) also highlights an investigation into the variabilities in southern water flows in the South Atlantic and their connections with changes in the planet’s climate, concluding that, due to the high specific heat of water and its large mass, covering about 71% of the Earth’s surface, the ocean is the main controller of the planet’s climate system (Campos *apud* Bernardes, 2023).

Despite being circumstantially serious scientific studies, for now, these are just a few more variables that increase the uncertainties of impacts on South Atlantic ecosystems and point to the need for timely mitigating measures. That said, from the comprehensive perspective of environmental security (Buzan and Waever, 2003), it is necessary to increase investments by the Brazilian State in multidisciplinary research and monitoring in the Blue Amazon, reducing uncertainties, mitigating risks, and providing the propagation of such procedures within ZOPACAS, in addition to facilitating specific bilateral and multilateral technical agreements within the forum that unites the South Atlantic. While the intelligence system is essential in identifying and assessing conventional threats or even complex threats posed by groups capable

16. Global Ocean Observing System, created by the Intergovernmental Oceanographic Commission (1991).

17. South Atlantic South Overturning Circulation Basin-wide Array.

18. Atlantic Meridional Overturning Circulation.

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of infringing damage to the state, in the case of climate change, monitoring and research of the marine biome is essential.

### 3. Brief analysis of the mitigating actions of the Armed Forces

**“Identifying links between climate change and defense is challenging, but planning and structuring sustainable, resilient, adaptive, and active military forces to protect marine ecosystems is even more complex...”**

What has been presented so far causes a natural concern about what mitigating actions the Brazilian State should take. Identifying links between climate change and defense is challenging, but planning and structuring sustainable, resilient, adaptive, and active military forces to protect marine ecosystems is even more complex, requiring a deeper and more detailed analysis than this policy paper can provide.

According to Lemos Júnior (2020), “jointness”<sup>19</sup> is a critical military advantage, while the insertion of environmental issues in this decision-making cycle may also be. There are records of climate change being treated as a threat in several national Security and Defense documents and strategies, such as in the USA (2022), France (2022), India (2019), the United Kingdom (2021), Germany (2016), the European Union (2008) and NATO (2021).

Taking the US Department of Defense (DoD) as a reference, it is observed that Brazil has a long way to go, but has already registered the first and significant steps in this process. The DoD is conducting the preparation of a climate change-adapted “Standby Force” through appropriate training and equipment. Such combat forces shall be capable of operating under the most extreme and adverse weather and terrain conditions. Current actions include evaluation and review of testing and training programs, equipment, exercises, and procurement for integration of climate change considerations. Adaptation and resilience are the key words of the American process.

Five working subgroups were created in the Department of Climate Defense: (i) carbon pollution-free electricity, (ii) operational energy, (iii) climate literacy, (iv) climate war games, and (v) electric vehicle fleet charging (US, 2022). This reality still seems distant from Brazil, whose Armed Forces work daily to keep their main equipment, with more than two decades of use, in full condition to perform an efficient conventional combat. However, the design of the conventional nuclear-powered submarine, in addition to the technological and strategic-operational leap, will incorporate a naval environment with zero carbon emissions.

In the US case, it is observed that the most important thing in the first stage of the process was to incorporate climate considerations into strategies, planning, and decision-making processes. In 2022, the US Navy, Army and Air Force launched climate action plans (US, 2022) with extensive inter-ministerial correlation.

Since 2012 and more assertively from 2019, with the creation of a permanent group for the elaboration of the Marine Spatial Planning (PEM for its acronym in Portuguese), coordinated by the Secretariat of the Interministerial Commission for Sea Resources (SECIRM for its acronym in Portuguese), Brazil has increased integrative actions for its elaboration and execution until 2030. This effort refers to meeting the 2030 Agenda, a commitment in which the participating countries will seek to create measures to transform their sustainable development. This Agenda is derived from several documents from important international meetings, such as Agenda 21, from Rio-92, “The Future We Want”, from Rio+20, in addition to the establishment, in the 2000s, of the Millennium Declaration<sup>20</sup> (Violante, Da Costa and Leonardo, 2020). The main areas of PEM include maritime transportation, renewable energy, marine conservation/protection, mining, fishing, aquaculture and oil and gas exploration, bringing out the integrative perception in a continuous and cyclical process, resulting in an ordering of these spaces (Violante, 2023).

19. Integration of the essential combat skills of the Singular Forces (Navy, Army, and Air Force) which produces a synergistic, multidimensional and juxtaposed effect, from the strategic level in the conduct of war.

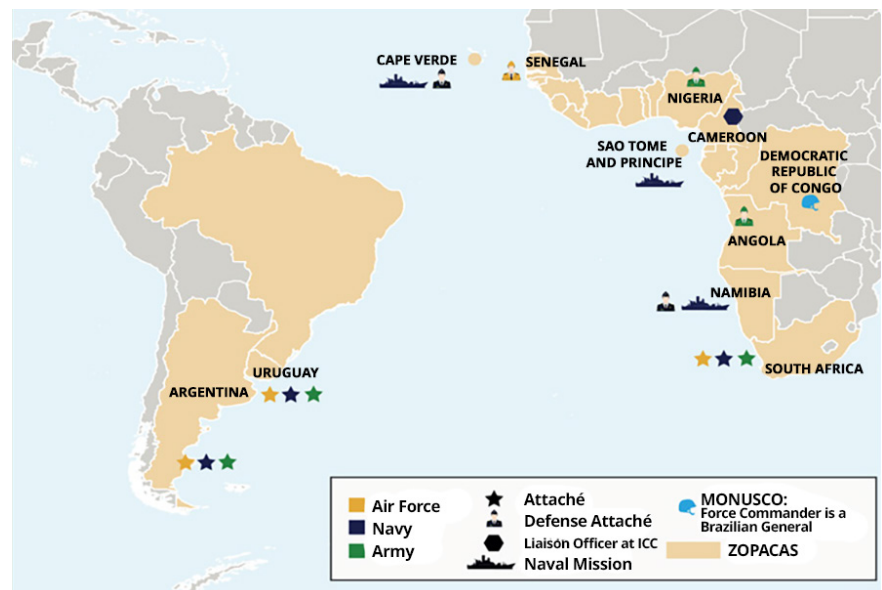
20. See more in: Agenda 2030. Available in: <http://www.agenda2030.org.br/sobre/>. Accessed 11 October 2020.

In 2017, the Brazilian Ministry of Defense released the “Green Book of Defense”, officially entitled “Defense and Environment: preparation with sustainability”. It presents concepts of protection and preservation; sustainability; cases of recovery actions of original biomes; support operations; and relevant legislation (Ministério da Defesa, 2017). The “Mar Verde”<sup>21</sup> project developed by the Brazilian Navy in the city of Presidente Epitácio/SP, and the Joint Environmental Operations<sup>22</sup> “Verde Brasil” and “Samaúma”, are also examples of the Armed Forces’ commitment to environmental protection and preservation.

Another case that deserves to be recorded in relation to the protection of the marine biome and the Blue Amazon was the operation to control and mitigate the effects of the large oil spill that hit states in the northeast and southeast of Brazil in 2019. It should be noted that, based on the lessons learned, the Brazilian Navy, through the Naval War School (EGN for its acronym in Portuguese) - the only School of High Studies of the Armed Forces that has, simultaneously, expertise and the structure of a Game Center - conducted, in August 2023, the first “Oil Spill Incident Game in Brazilian Jurisdictional Waters (JIDO for its acronym in Portuguese)”, with an interagency focus and aimed at decision-makers from government and non-governmental agencies, protagonists in accidents of this type (EGN, 2023). This means being one step ahead in the event of a new disaster of this nature.

It should also be noted that the scope of Operation Ágata<sup>23</sup>, having incorporated the “maritime border” since 2017, includes the fight against cross-border and environmental crimes, with regular and significant annual records of seizures of timber, ore, irregular fish and agricultural products; as well as the protection of indigenous peoples on indigenous lands; without forgetting the traditional seizures of drugs, cigarettes and weapons, with the Brazilian Navy playing a growing role in the area of Blue Amazon operations (Lemos Júnior, 2020). It can be said that in the new conception of the aforementioned constabulary operation, “the blue is the new green”<sup>24</sup>.

**Figure 2.** Presence of the Brazilian Armed Forces in ZOPACAS



Source: Brasil, 2023.

21. Carbon neutralization project, recognized by an external environmental audit, which planted 1,500 native trees of the Atlantic Forest under the coordination of the Brazilian Navy’s Presidente Epitácio River Police Station.

22. Guarantee of Environmental Law and Order Operations (GLO).

23. Joint Operation coordinated by the Joint Chiefs of Staff of the Armed Forces (EMCFA for its acronym in Portuguese), under the Integrated Border Protection Program (PIIF for its acronym in Portuguese), under the governance of the GSI-PR, supported by Decree No. 8903 of 2016, replacing the Strategic Border Plan (PEF for its acronym in Portuguese), which contributes to the strengthening of the Integration of the Singular Forces, that is, jointness and interoperability.

24. “Blue is the new green”; an allusion to the increased relevance of maritime security actions and the protagonism of the oceans on the International agenda.



From 2021, when Brazil became an effective member of the G7++ FoGG<sup>25</sup> (Friends of the Gulf of Guinea) forum and inserted in the Brazilian Navy's biannual agenda the "Operation Guinex", whose objective is to strengthen the capabilities of the Naval Forces of African member countries of ZOPACAS, with priority for the Gulf of Guinea (Cerqueira, 2022), materializing the overflow of Brazilian responsibility in the South Atlantic beyond the Blue Amazon.

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Thus, considering climate change as a complex threat is still a process under construction, almost a provocation for reflection, since such a framework necessarily requires the effective involvement of the Defense sector with the adaptation of capabilities, military doctrines, and decision-making cycles at the strategic and operational levels, not only strengthening the research, monitoring and prompt response to environmental disasters. But the Brazilian state is on an auspicious path.

#### 4. Final considerations and suggestions

At the end of this policy paper, it is clear that there is a long way to go, but that the Brazilian State and its Ministry of Defense have taken significant steps in the insertion of climate change in the national Security and Defense agenda, adding arguments for the discussion of its classification as a Complex Threat, and facilitating the rational development that considers the sustainable use of living and non-living resources of the complex ecosystems of the Blue Amazon and the South Atlantic, by using ZOPACAS as a south-south cooperative and integrative discussion forum, duly connected with the other international mechanisms present in this oceanopolitical space.

In order to catalyze such an evaluation process, here are some recommendations:

1) **Expand the monitoring and multidisciplinary research of the marine biome in the Blue Amazon.** The National Institute for Oceanic Research<sup>26</sup> (INPO for its acronym in Portuguese), linked to the Ministry of Science, Technology and Innovation (MCTI for its acronym in Portuguese), was created with the objective of expanding studies in this area, mitigating the deficiency of the few data collection sensors in the South Atlantic, taking advantage of and interconnecting projects already in progress conducted by traditional organizations such as the Navy Hydrography Center (CHM), the USP Oceanographic Institute, structures of the Ministry of the Environment and other Brazilian universities with international recognition.

2) Although we have bilateral defense cooperation agreements with fourteen<sup>27</sup> of the twenty-three ZOPACAS member countries, it would be more efficient to **enter into specific technical agreements that refer to particular, reciprocal, or complementary capabilities between the states on both sides of the South Atlantic.**

3) The electrification of naval propulsion, land and air assets would today be a distant reality from the Brazilian Armed Forces. However, **the Brazilian conventional nuclear-powered submarine project**, in addition to the technological and strategic-operational framework, provides the environment with zero carbon emissions, which, after mastering the technology, could be multiplied with due and necessary safety, the Brazilian Navy's absolute priority.

25. Multinational initiative designed in 2013 to coordinate efforts in the development of maritime capacities in the Gulf of Guinea, composed of G7 countries and Friends of the Gulf of Guinea: Canada, Germany, Italy, Japan, France, United Kingdom, USA, Belgium, Brazil, Denmark, Netherlands, Norway, Portugal, Spain, Switzerland, European Union and UNODC.

26. Instituted by Decree No. 11.275 of 2022.

27. South Africa, Benin, Angola, Argentina, Cape Verde, Ghana, Guinea Bissau, Equatorial Guinea, Namibia, Nigeria, Senegal and Uruguay.

4) Taking the concept of twin cities on the land border of Brazil, it would be possible to **approach African and South American ports**, with the objective of exchanging good practices, information, and investigations in case of illicit acts by ships, with due priority for the control of ballast water, whose exchange must be carried out on the high seas.

5) **Maintain support to the African Naval Forces in their capacity building** through naval missions, scholarships for high-level training courses in Brazil and the Brazilian Navy's "Operation Guinex" in order to mitigate IUU fishing on the West African coast; as well as the **Brazilian Ministry of Foreign Affairs maintaining cooperation efforts with countries on the West African coast**, with emphasis on the creation of the South Atlantic Whale Sanctuary.

6) **Evaluate the increase in the inclusion of climate considerations** in strategies, planning, and decision-making processes, as well as a reference in the perspective of evolution and modernization of the Armed Forces by 2040. ■

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