OBSERVATOIRE Défense & Climat

Note

THE STRATEGIC USE OF CLIMATE VULNERABILITIES IN CONTEMPORARY CONFLICTS: MODALITIES AND FEEDBACK EFFECTS

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DGRIS

IRIS INSTITUT DE RELATIONS INTERNATIONALES ET STRATÉGIQUES

The Defence and Climate Observatory, launched in December 2016, aims to study climate-related security and defence issues.

It is coordinated by IRIS as part of the contract carried out on behalf of the French Ministry of Armed Forces's Directorate General for International Relations and Strategy (DGRIS). The Observatory's multi-disciplinary team includes researchers specialising in international relations, security, defence, migration, energy, economics, climatology and health. It is directed by Mathilde Jourde and François Gemenne.

The Observatory has initiated numerous collaborations with European partners (Netherlands, Luxembourg) and international partners (Australia, United States, India), international NGOs and national and international public bodies. These initiatives have strengthened cooperation on climate issues and their security implications.

The Climate and Defence Observatory produces reports and notes, organises restricted seminars and conferences open to the public, and hosts the podcast "On the climate front".

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The Ministry of Armed Forces regularly calls upon private research institutes for outsourced studies, using a geographical or sectoral approach to complement its external expertise. These contractual relationships are part of the development of the defence foresight approach, which, as emphasized in the White Paper on Defence and National Security, "*must be able to draw on independent, multidisciplinary and original strategic thinking, integrating university research as well as specialized institutes*".

Many of these studies are made public and available on the Ministry of Armed Forces website. In the case of a study published in part, the Directorate General for International Relations and Strategy may be contacted for further information.

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Since the early 2000s, climate change[1] has gradually become a central focus of states' foreign and domestic policies. In this context, security and defence actors have shown **growing interest in its geopolitical, strategic, and security implications**. These actors operate at national levels (ministries of Foreign Affairs, Defence, or Interior Security), regional levels (North Atlantic Treaty Organization (NATO), European Union (EU), African Union, etc.), and international levels, as exemplified by the United Nations (Security Council, General Assembly). This heightened interest in **climate security**[2] is reflected in the proliferation of international events dedicated to these issues (e.g., the Climate Security Conferences in Montreal and Berlin), the funding of monitoring and analytical tools (such as the Defence and Climate Observatory and the CASCADES project[3]), the integration of climate considerations into security doctrines (National Strategic Review of 2025), the adoption of specific plans and strategies (France's Defence and Climate Strategy; the U.S. Department of Defence Climate Adaptation Plan; the U.K. Ministry of Defence Climate Change and Sustainability Strategic Approach; NATO Climate Change and Security Action Plan), and the creation of dedicated departments (e.g., the United Nations Climate Security Mechanism). Today, the most studied climate security topics—both academically and operationally—include the direct consequences of weather and climate hazards[4] on populations (relief, assistance, and protection) and on the operational capacities of defence apparatuses (infrastructure, missions, equipment, personnel). Particular attention is also given to the links between climate change, population displacement dynamics, and competition.

However, the integration of climate issues by defence and security actors currently faces several obstacles. First, certain narratives highlight a tension between defence priorities and the consideration of climate change, with attacks explicitly targeting climate-related advances within security institutions. For example, in the United States, the Trump administration gradually dismantled efforts by the Pentagon—initiated in the 1990s—to integrate climate change into the Department of War's doctrines and strategies[5]. This dismantling has tangible consequences, such as the abandonment of the military adaptation plan (Alexandre, 2025), which poses risks to operational and capability transformations needed to address climate change (Sikorsky, 2025). **This dynamic occurs within a broader political context characterized by the deprioritisation of climate issues**, a phenomenon that delays necessary mitigation[6] and adaptation[7] actions. The European Union appears to have followed this trend, as evidenced by the Omnibus legislative and regulatory corpus, which weakens many climate-related advances (Jourde, 2025). In the United States, a rollback of climate and environmental commitments is also underway, including the deliberate targeting of climate science and policy: certain

[1] See definition in the glossary
[2] See definition in the glossary
[3] A consortium composed of European research centres (Chatham House, Adelphi, Barcelona Center for International Affairs, etc.) has set up this project to identify how climate-related risks affecting countries outside the continent can have repercussions within Europe itself.
[4] See definition in the glossary
[5] Secretary of Defense Pete Hegseth described concerns about global warming as "climate-change nonsense" (Waldman, 2025).
[6] See definition in the glossary
[7] See definition in the glossary

terms related to the environment, climate, or clean energy are now prohibited in academic publications under threat of funding loss (Duffau, 2025).

A joint analysis of security and climate issues is, however, essential in light of the current geopolitical and environmental context. **Geopolitically, there is a proliferation of narratives centered on the (re)emergence of certain concepts aimed at characterizing the evolving nature and intensity of contemporary conflicts.** The concepts of "high-intensity" conflicts or wars and "hybrid warfare[8]," in particular, are widely referenced by academics, states, and media actors, notably in connection with Russia's invasion of Ukraine (Bavarez et al., 2025). In this sense, the notion of a return to "**high-intensity**" conflicts reflects the resurgence of direct confrontations between certain armed groups (regular armies, conventional forces, non-state actors). This evolution has been documented in a report by the International Committee of the Red Cross, which recorded 30 armed conflicts in 1990 compared with 120 in 2024 (ICRC, 2024). The growing use of the concept of "**hybrid warfare**" [9] also reflects contemporary security concerns of many states, particularly in Europe. This concept captures "all military and non-military practices, considered coordinated and centralized, aimed at destabilizing an adversary society as a whole" (Barbin, 2018)[10]. **In summary, these two notions highlight the resurgence of conflicts, the porous nature of warfare modes, and the permeability between peacetime and wartime** (Bilal, 2021). **They thus provide complementary analytical tools for examining why and how certain conventional and non-conventional instruments are employed in contemporary conflicts** (Tenenbaum, 2015).

Alongside geopolitical dynamics, climate change continues to intensify, with scientists observing that its pace and intensity are now accelerating faster than initial projections (Forester et al., 2024). Indeed, the persistence of a globally carbon-intensive energy mix—fossil fuels still account for 80% of primary energy consumption (General Commission for Sustainable Development, 2025)—has led to alarming records. In 2024, for the first time, the global average temperature exceeded 1.5 °C (WMO, 2025). The number of meteorological disasters has also risen sharply, having increased fivefold between 1970 and 2021 (WMO, 2023). The year 2024 was historically notable as the third most costly year in terms of losses from natural disasters since 1980, illustrating how climate change could render certain regions uninsurable (Clinkemaillié, 2025). The international community's failure to sufficiently mitigate greenhouse gas emissions—and thereby limit the rise in global average temperature—undermines the political goals set under the Paris Agreements (limiting global warming to 1.5 °C, or at most 2 °C, above pre-industrial levels) (Garric, 2025). Available data thus suggest that the current

[8] See definition in the glossary

[9] This concept, frequently used in the context of the Russo-Ukrainian conflict to describe the diversity of means employed by Russia to harm its adversaries (Semo, 2022), initially emerged in the late 1990s. It was popularized by Frank G. Hoffman from 2005 onwards and later adopted by NATO in the 2010s as part of a new strategic concept (Barbin, 2018). Despite its widespread use, the semantic framework of the concept of hybridity remains vague and lacks any universally accepted definition. It is therefore employed to designate a range of phenomena without necessarily referring to the same reality depending on the author or institution using it (Tenenbaum, 2015).

[10] This concept provides a particularly relevant analytical framework for understanding how climate issues and security risks are connected. It notably makes it possible to highlight the vulnerability of several areas that are already experiencing the effects of climate change—such as critical infrastructure, agricultural production, or the information sphere—to various forms of hybrid interference.

trajectory of climate change is likely to worsen (Climate Analytics, 2024). Moreover, climate change, combined with human activities, is severely degrading the natural environment and ecosystems: by 2025, seven of the nine planetary boundaries have already been exceeded, directly threatening the planet's habitability.

This note from the Defence and Climate Observatory seeks to move beyond the dominant debates within the climate–conflict nexus[11], which have focused on the role of climate change as a direct driver of conflict and have been widely echoed by media and state actors. This approach has been largely challenged by the scientific community and has gradually been replaced by the understanding of climate change as an indirect conflict factor, conceptualized through terms such as "risk multipliers" (DGRIS, 2025; French National Assembly, 2024; Ministry of the Armed Forces, 2023), "threat multipliers," or "chaos catalysts" (CNA Advisory Board, 2014)[12]. These concepts provide a relevant framework for understanding the interactions between climate issues and socio-economic and political factors (Selby and Hofflan, 2014), but they do not specify how climate change is integrated as a strategic lever within conflict dynamics.

Accordingly, we propose a case study analysis of contemporary conflicts of varying nature and intensity—the Indo-Pakistani conflict over Kashmir, insecurities in the Lake Chad region, the Yemeni civil war, and the Russo-Ukrainian war—to understand how **climate vulnerabilities are used as strategic levers**, ranging from instrumentalization to weaponization in conflict contexts (I). The second part will then examine the **environmental degradation caused by conflicts, also instrumentalized by belligerents**, the feedback loops they trigger, and their strategic implications (II). Based on these analyses, the note will conclude with three forward-looking scenarios, accompanied by recommendations for the Ministry of the Armed Forces (III).

[11] See definition in the glossary

[12] This perspective is rooted in the Malthusian tradition, linked to the tensions created by the scarcity of certain resources and population growth (Homer-Dixon, 1999). The Syrian civil war or the Arab Spring are often cited to illustrate the conflictual role of climate change (Bou Nader, 2018).

PART 1

THE USE OF CLIMATE VULNERABILITIES AS A STRATGEIC LEVER IN CONTEMPORARY CONFLICTS: FROM INSTRUMENTALIZATION TO WEAPONIZATION

A. The Use of Water Vulnerability as a Strategic Lever

In this first part, we examine **how the harmful effects of climate change on natural resources essential to human societies are used as strategic levers in conflict contexts** of different natures and intensities. We group these effects under the term "climate vulnerabilities," which we define as the degree to which a social system is susceptible to being affected by climate change, including climate variability and extreme climate events. Within the framework of this note, we define "strategic lever" as an element or dynamic—tangible or intangible, proven or perceived, material or immaterial—that an actor uses in a power relationship to take advantage of an event or a situation.

This first part focuses more specifically **on climate vulnerabilities related to access to and management of** freshwater, as well as those affecting **agri-food systems**. For clarity, in the following case studies, we refer to water vulnerabilities as those concerning freshwater, and to agri-food vulnerabilities as those related to agri-food systems. The four case studies are located in different geographical areas—South Asia, Northwest Africa, the Arabian Peninsula, and Eastern Europe—and concern contemporary conflicts and conflict dynamics. Relying on the definition proposed by Tobias Ide, the terms "conflicts" and "conflict dynamics" refer to "concrete, coordinated, and public actions carried out by members of a social group, or an alliance of social groups (real or perceived), aimed at asserting or defending their interests, which they consider incompatible with those of at least one other social group—or alliance of groups" (2025, 2). This definition allows for the inclusion of a variety of configurations: conflicts between regular armies, between conventional forces and non-state groups, diplomatic tensions, the use of sanctions, etc.

This analysis shows that **the use of climate vulnerabilities as a strategic lever in contemporary conflicts occurs through various manoeuvres—discursive, normative, informational, coercive, offensive—which fall along a continuum from instrumentalization to weaponization**. The instrumentalization of climate vulnerabilities refers to their exploitation to influence, coerce, or harm a third party—whether another stakeholder or an actor external to the conflict—and/or to maximize one's own benefits, whether within the context of the conflict or its surrounding dynamics. The weaponization of climate vulnerabilities, in contrast, refers to their direct use as a material target in armed confrontations, taking the form of destruction of essential infrastructures in order to weaken an adversary, subdue them, or recruit a group.

1. Freshwater: a vital and belligerent resource

Freshwater is vital for human societies. However, this resource faces multiple anthropogenic pressures—population growth, urbanization, intensive agriculture, pollution—that negatively affect its

quality and availability. Climate change, in particular, impacts all components of the hydrological cycle, leading to greater variability in the occurrence and/or intensity of floods and droughts (Caretta et al., 2022; Duffau et al., 2024). **Water vulnerabilities have economic, social, political, and geopolitical repercussions due to their effects on numerous sectors** (agriculture, industry, energy, public health, etc.).

Given its vital nature, water also has a belligerent character. Since Antiquity, water has been both an "instrument of—and in—war," meaning it has been both a target in attacks and used as a means to attack (Larché, 2024, p.175; Galland, 2021). From the end of the Cold War onward, numerous researchers have studied the link between water and violent conflicts, arriving at divergent conclusions regarding this correlation and the factors likely to trigger water-related conflict (Burgess et al., 2013). However, studies show that cooperation over water remains far more frequent than confrontation (Wolf et al., 2003; De Stefano et al., 2010), although this balance has recently begun to shift, particularly in Africa and Asia (Kåresdotter et al., 2023).

In addition to studies analysing the use of water as a weapon or target of war, as well as a source of tension or cooperation, we **examine the use of water vulnerability as a strategic lever in contemporary conflicts**. To do so, we rely on the premise that "water is a commodity, endowed with a certain economic value and therefore political significance, linked to its abundance or scarcity" (Burgess *et al.*, 2013, 2)[13]. We propose an analysis focused on two case studies that meet three criteria: the first is located in South Asia (Kashmir), and the second in Northwest Africa (Lake Chad). The first criterion concerns their location in regions particularly affected by the consequences of climate change. The second relates to the physical configuration of the water resource, which is shared among multiple states. Finally, the third criterion is linked to the conflict dynamics present in these territories.

These case studies show **how water vulnerabilities—whether real or constructed—are instrumentalized in contemporary conflicts**. In both the Kashmir conflict and the Lake Chad region, water vulnerabilities have been subject to **discursive instrumentalization aimed at serving economic objectives** (access to new markets), foreign policy goals (influence, renewal of bilateral relations, securing financial support), or domestic objectives (gaining support, depoliticizing the security situation**). In the case of Kashmir, this instrumentalization has also taken normative forms** (legal obstruction by Pakistan and lawfare by India) **and informational forms** (disinformation by Pakistan and data withholding by India), aimed at harming or even coercing the adversary. However, these analyses do not claim to cover all forms of using water vulnerabilities as a strategic lever. Other cases occupy different positions along the instrumentalization–weaponization continuum and reveal more offensive practices, such as the deliberate destruction of hydraulic infrastructure (dams, sanitation networks,

[13] Although reductive, this assumption nevertheless makes it possible to examine the use of water vulnerability as a strategic lever in conflict contexts. Other analyses propose considering other meanings of water, whether cultural, religious, or spiritual (Burgess et al., 2013).

water supply systems), which has notably been employed by Russia against Ukraine and by Israel against Palestine[14].

2. Case Study 1: Water Vulnerability as a Strategic Lever in the Indo-Pakistani Conflict over Kashmir

The Persistence and Transformations of the Indo-Pakistani Conflict over Kashmir

The conflict between India and Pakistan originates from the partition of British India in 1947 and centres on the territory of Kashmir, located in the Indus River basin, which is divided into two main areas: one administered by Pakistan and the other by India**.**[15] Despite the acceptance of this partition by both countries in the early 1970s, their territorial claims have persisted, while the modalities of the conflict have undergone significant changes. Since the early 2000s, India has been the target of attacks and assaults claimed by Islamist movements[16], which it accuses of being supported by Pakistan (Beaumont, 2025)[17]. At the same time, the conflict has taken on an increasingly **identity-based dimension** (Thomas, 2025), particularly since Narendra Modi came to power in 2014, whose party promotes a discourse of Hindu nationalism. In response, the Indian government has resorted to military, diplomatic, and administrative measures, as well as attempts at coercion—repeatedly threatening to cut Pakistan's access to the waters of the Indus basin (Mohan, 2025). These threats reveal the **strong interconnection between the territorial dispute and water resources in the conflict** between the two countries.

The Indus Basin: Physical Asymmetries Amplified by the Construction of Hydraulic Infrastructures and the Effects of Climate Change

The position of India and Pakistan on the Indus basin is characterized by a **major asymmetry**: India is located upstream of all the watercourses of the basin, while Pakistan is downstream. This position grants India a strategic advantage, amplified by Pakistan's extreme dependence on these waters (Sajjad, 2023). After several years of negotiations, the two countries signed in 1960 the Indus Water Treaty (IWT), which allocates about 20% of the basin's water to India and 80% to Pakistan (Barua, 2025) by dividing control over the tributaries.[18] This treaty also sets the conditions for the use of the resource and provides mechanisms for information sharing and conflict resolution.[19] Despite these legal provisions, India may be understood as a **hydro-hegemon** [20] (Hanasz 2014 ; Elahi, 2023 ; Galland, 2025 due to this physical asymmetry and the differences in military, commercial, and technical power between the two countries. These differences fuel a real anxiety in Pakistan regarding India,

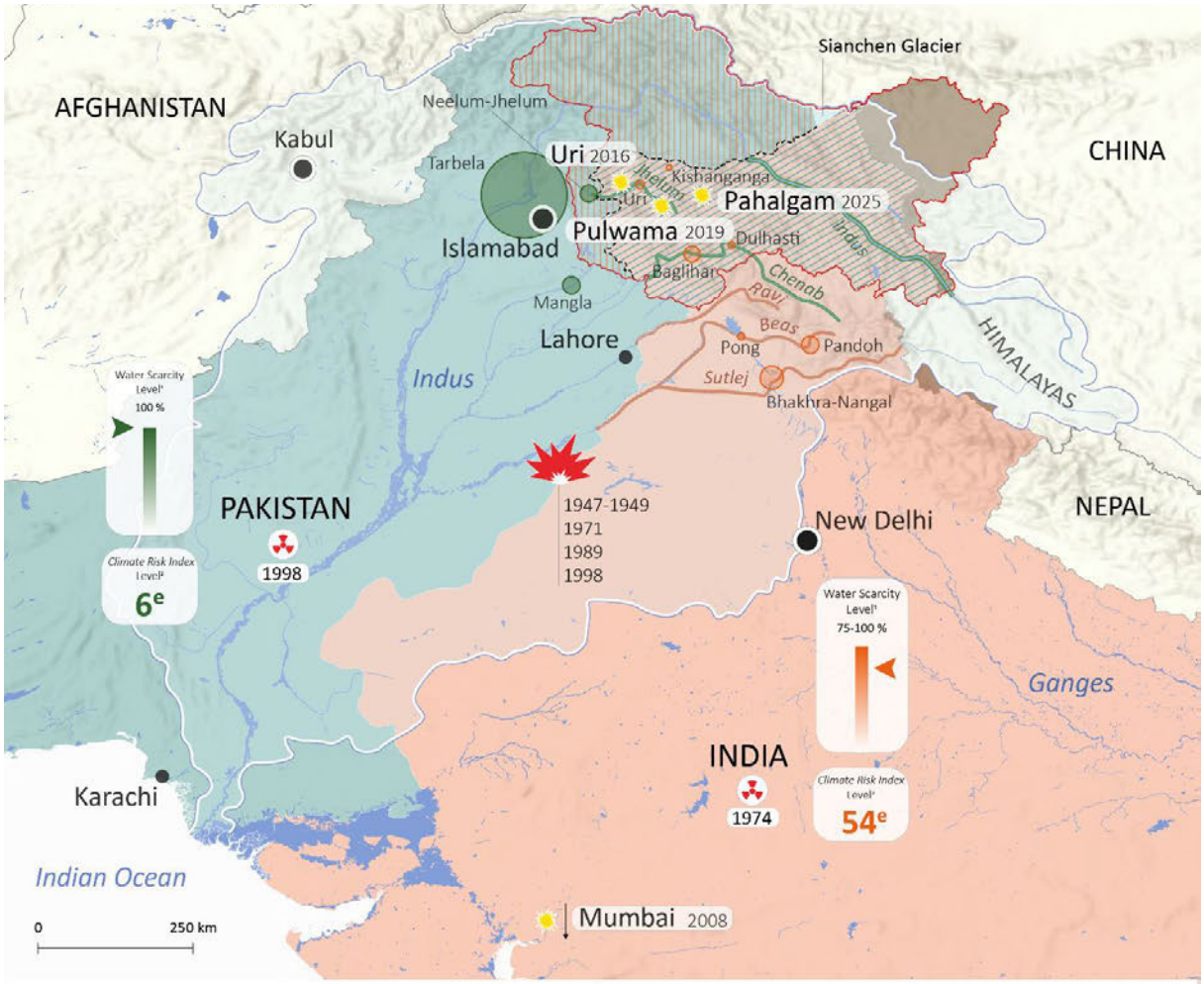
[14] For more, see Duffau *et al.*, 2025 et Hall *et al*. 2024.
[15] These two areas were first separated by a ceasefire line in 1949, and later by the Line of Control established in 1972 (the Shimla Agreement – suspended by Pakistan following the clashes of May 2025). China also controls a small part of the territory, ceded by Pakistan and claimed by India.
[16] The targets of these attacks were administrative (2001), military (2016, 2019), but also tourist sites (2008, 2025). These dates are not exhaustive.
[17] In an interview dated April 25, 2025, the Pakistani Minister of Defense did not deny the accusations of supporting terrorist organizations, explaining that Pakistan had been "doing the dirty work for the United States and the West" for many decades (Shaikh, 2025).
[18] The IWT grants exclusive rights over the three western tributaries to Pakistan (Jhelum, Chenab, and Indus) and over the three eastern tributaries to India (Sutlej, Ravi, and Beas).
[19] This treaty allows India to use the flow of rivers under Pakistani control solely for irrigation, domestic purposes, and hydroelectric power generation (Galland, 2025). The IWT also provides for information-sharing mechanisms and conflict-resolution commissions (Ahmad, 2011; Ahmad, 2012).
[20] That is to say, the state dominating the transboundary water resources (Zeitoun and Warner, 2006).

notably linked to the construction of hydraulic infrastructures (Mehsud et al., 2022; Climate Diplomacy, 2025), which constitute a recurring source of disputes between the two parties (Bisht, 2011).

Water issues are all the more central given that Pakistan is among the countries experiencing critical water stress, and India high stress (FAO, 2024). This situation of water vulnerability therefore threatens the human security of populations. Yet the Indus basin is the second most overexploited in the world (Mukunth, 2015). **Water is particularly used for agriculture and hydroelectric** production (Kakakhel, 2015). These uses alter the quantity and quality of the water, to which are added poor resource management in both countries[21]**, and the consequences of climate change:** rising temperatures, floods and droughts, glacier melt, changes in precipitation patterns, desertification (Sajjad, 2023; Mumtaz et al., 2025; Das, 2025).

[21] The management of water resources by India and Pakistan demonstrates practices with deleterious effects, including excessive extraction of groundwater from the basin (notably for irrigation systems), poor distribution of resources among local populations, and insufficient adaptation of water-intensive crops.

Map 1 - The Indo-Pakistani Conflict over Kashmir: Between Territorial Rivalries and Vulnerabilities



Territorial Rivalry for Kashmir's Control

The Partitioning of the Kashmir Region

- Border of the Jammu-and-Kashmir Royal State in 1947 before British India's partinioning
- Territory controlled by Pakistan, contested by India
- Territory controlled by India, contested by Pakistan
- Territory controlled by China, contested by India
- Line of control (1972 Simla Agreement)

A Region Marked by Wars and Violences

- India-Pakistan wars since 1947
- Nuclear powers (first trial year)
- Uri 2016 — Attacks in India claimed by Islamist or autonomous movements

The group which first claimed responsibility for the 2025 Pahalgam attack later retracted its statement.

Water in the Indus Basin: A Resource Unequally Shared and Subject to Change

A Geography Favorable to India Demanding a Cooperation Framework

- Indus Basin
- Western tributaries under Pakistani control, within the framework of the 1960 Indus Waters Treaty, suspended by India in 2025
- Eastern tributaries under Indian control, within the framework of the 1960 Indus Waters Treaty, suspended by India in 2025

A Basin Transformed by Water Infrastructures and Climate Change

- 4 888 MW — Capacity of Pakistan's major dams
- 1 000 MW
- 1 325 MW / 330 MW — Capacity of India's major dams

1. Water stress level corresponds to the ratio between freshwater withdrawals and available renewable resources, considering environmental water requirements.

2. The Climate Risk Index, developed by Germanwatch, analyses how extreme weather events affect countries, thereby measuring their consequences on those nations.

Sources: Center for Strategic and International Studies (CSIS), *Le Monde diplomatique*, *Le Monde*, Climate Risk Index 2025 du Germanwatch, UN Water.

The instrumentalization of hydric vulnerability through discursive, normative, and informational manoeuvres

In the context of the conflict over Kashmir, **the waters of the Indus basin — and more specifically the water vulnerability of the social systems that depend on it — are used as a strategic lever[22] according to common but differentiated modalities.** These manoeuvres are manifested through discursive processes (securitization[23], i*ssue-linkage*[24]), normative processes (legal obstruction, *lawfare*[25]) and informational processes (withholding and manipulation of information). Through these instrumentalizations, the stakeholders in the conflict pursue politico-strategic objectives related to security and foreign affairs, but also domestic policy.

First of all, **water vulnerability is the object of discursive instrumentalization by both parties to the conflict**, although through distinct framings. **In official Pakistani communications, water vulnerability is explicitly associated with Kashmir** (Bisht, 2011). The consequences of climate change on the water stress affecting the country are thus described as existential threats, which would be likely to fuel terrorist movements. Moreover, **Indian hydraulic infrastructure projects are presented as security threats**, as they would give New Delhi the ability to provoke floods or droughts in Pakistan, in a context where these phenomena are worsening due to climate change (Bisht, 2011; Shidore, 2020). These discursive manoeuvres aim to serve Pakistani foreign policy, which seeks international support to increase and reinforce its position and the legitimacy of its territorial claims. They also make it possible to shift blame away from the authorities regarding the poor management of the water situation, and to satisfy domestic political constituencies (Sinha, 2010; Bisht, 2011; Vitar 2011; Michel, 2025; Thomas, 2025).

The Indian security discourse is also based on a dual narrative. On the one hand, it presents Pakistani opposition to hydroelectric projects as a threat. Such opposition would hinder Indian economic development, low-carbon electricity production, and the security of its population (Michel, 2025). **On the other hand, the Indian discourse establishes a direct link between terrorist attacks on its territory and the management of the basin's waters** (Farooquee and Armstrong, 2025). In retaliation, the Indian government has indeed proposed granting itself the entirety of the basin's water resources flowing through its territory (Vater, 2021; Ethirajan and Wertheimer, 2025). Moreover, by insisting on these development needs and the necessity of contributing to emission-reduction efforts, India seeks to obtain international support. These strategies ultimately help fuel the legitimization of India's territorial claims over Kashmir. This narrative also responds to the expectations of a civil society

[22] Given the physical characteristics of water in the Indus basin, the resource is inherently strategic, as it is essential to the survival of the populations of both belligerents. Thus, it is necessary to distinguish, on the one hand, the use of water as a strategic resource (Thomas, 2025), and, on the other hand, its use as a strategic lever—that is, its use to influence, harm, or constrain a third party, and/or to maximize one's own benefits.
[23] This term refers to the process by which an issue is constructed through a speech act as an existential threat, requiring exceptional measures (see Buzan et al., 1998).
[24] This term refers to a situation in which links are created between two political issues for strategic reasons.
[25] Strategic use of the law

marked by a strengthening of Hindu identitarianism and an intensification of hostility toward Muslims (Thomas, 2025) — Islam being Pakistan's official religion.

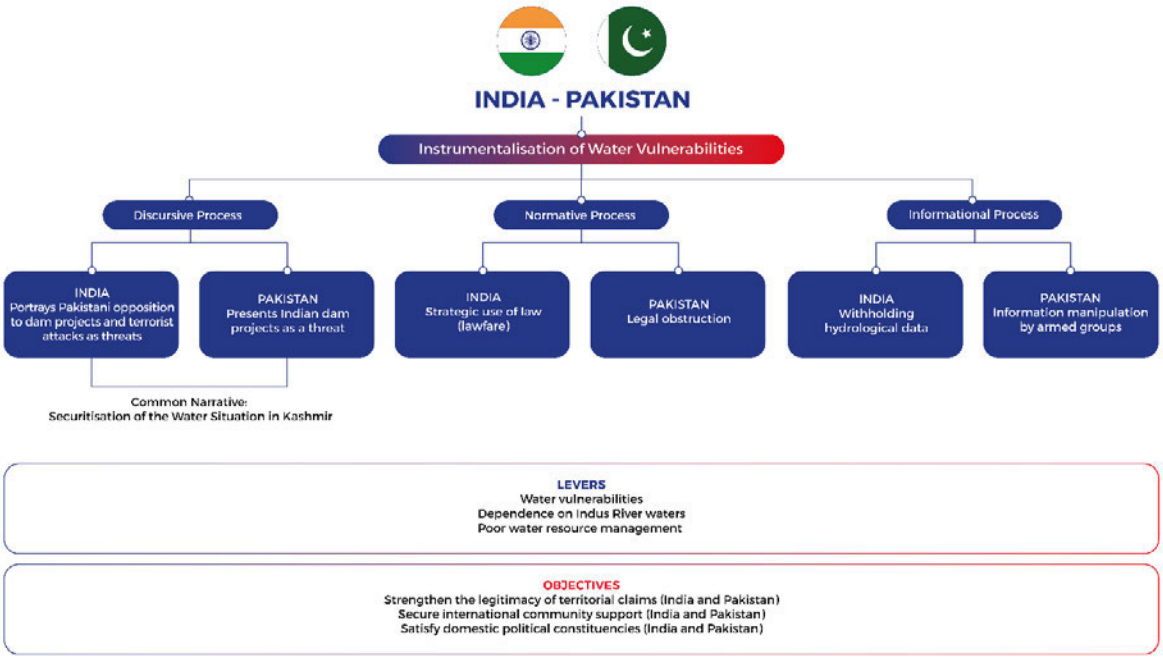
To these discursive practices are added normative processes used by both belligerents to influence — or even coerce — the adversary, though according to distinct logics. Pakistan favours legal obstruction, repeatedly challenging Indian dam projects through the contentious procedures and institutional mechanisms of the IWT (Shidore, 2020; Bisht, 2011). **India, for its part, resorts to lawfare, brandishing the threat of suspending the IWT**[26] **following terrorist attacks** (Guruswamy, 2019), and then effectively suspending the treaty after the April 2025 attack (Singh, 2025; Adil, 2025). The objective is thus to exert pressure on Pakistan, through legal means, within the framework of the Kashmir conflict. This posture also illustrates India's opportunistic behaviour (Michel, 2025), which uses terrorist attacks as a justification for the instrumentalization of hydric vulnerability, but which also — and above all — serves India's objective of modifying and renegotiating the IWT, considered unequal by Delhi. In 2023 and 2024, India had indeed officially notified Pakistan of its desire to modify the IWT, explicitly invoking the consequences of climate change, but also demographics, hydroelectric needs, and terrorism (Hussain, 2024; Choubey, 2025).

Finally, hydric vulnerability is instrumentalized through information-manipulation manoeuvres by leaders of Pakistani armed groups, but also in the media and on social networks. These armed groups regularly accuse India of being responsible for the deadly floods on its territory (Zahra-Malik and Tanveer, 2014; Faraz, 2014; Vater, 2021). These manoeuvres aim to influence public opinion and reinforce the legitimacy of the claims and actions of terrorist movements. **On the other hand, India practices the withholding of hydrological data on the waters of the Indus in order to harm Pakistan's capacities for flood forecasting and irrigation planning** (Gimle, 2019; Pathak, 2025; Khadka, 2025; Fraioli, 2025). This practice falls within a structural climate of mistrust, fuelled by a shared culture of non-disclosure of hydraulic data (Michel, 2025).

This case study demonstrates how, through discursive, normative, and informational manoeuvres, the hydric resource is instrumentalized by India and by Pakistan in order to influence the international community or local populations, but also to try to harm, or even coerce, the adversary within the framework of their rivalry over Kashmir. **Thus, hydric vulnerabilities are integrated into the repertoire of action of the belligerents,** who make political and strategic use of them to serve their territorial claims.

[26] Several examples illustrate these attempts at legal obstruction, notably concerning the construction of the Baglihar and Kishenganga dams.

Figure 1 – Water Vulnerability as a Strategic Lever in the Indo-Pakistani Conflict over Kashmir



3. Case Study 2: The "Disappearing Lake Chad" Narrative as a Strategic Lever

The supposed links between climate change and insecurities in the Lake Chad Basin

The Lake Chad Basin[27] is marked by multiple forms of insecurity (Chauvin et al., 2020), **notably those fuelled since 2009–2010 by the insurgent dynamics** led by the Islamist armed group Boko Haram and by their repression. The group, initially active in northeastern Nigeria, extended its operations to Cameroon, Niger, and Chad as early as 2014–2015. Following the establishment of an international anti-terrorist coalition, the movement became largely fragmented, operating with limited means despite its continued presence and violent actions (Magrin and Pérouse de Montclos, 2018). This situation has profoundly deteriorated the living conditions of local populations (economic and food insecurity) and led to significant internal and cross-border population displacements (Vivekananda et al., 2019; Daoust and Selby, 2022).

Since the early 2010s, this security situation has been explicitly associated with climate change in the official discourse of numerous regional and international political actors: representatives of the riparian states, the Lake Chad Basin Commission (LCBC), international organizations, European political leaders (including French ones), as well as think tanks and the media (Hance, 2013; Kindzeka, 2015; Skau, 2017; UNEP, 2018; Griffin, 2020; Daoust and Selby, 2022; Li, 2024). These discourses are

[27] Within the framework of this case study, we focus on contemporary conflict dynamics occurring in the conventional Lake Chad basin. This basin spans five countries: Niger, Nigeria, Cameroon, Chad, and the Central African Republic, and constitutes an entity defined by the member states of the Lake Chad Basin Commission (LCBC) (Lemoalle, 2015).

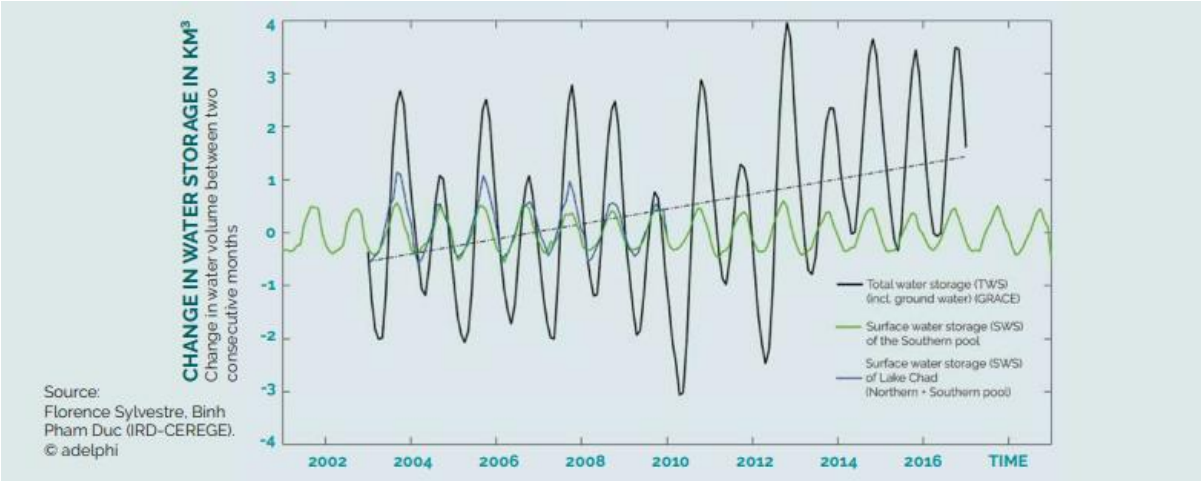
structured around a single narrative: **Lake Chad is said to be disappearing because of climate change, which would contribute to—or even be the cause of—insecurity in the region, notably the expansion of Boko Haram.** Yet scientific data demonstrate the inaccuracy of this assumption.

Lake Chad: a watershed marked by significant fluctuations

Lake Chad constitutes an essential source of food and water for nearly 50 million people (Pham-Duc et al., 2020) and supports local biodiversity and ecosystems. **However, this complex hydrological system remains difficult to study over the long term due to the security context and the reliance on satellite imagery**, the interpretation of which can be biased depending on whether the images are taken in the dry or wet season (Dupuy-Maury, 2020).

Lake Chad experienced a period of intense drought in the 1970s and 1980s, leading to a loss of 90% of its surface area, and to the subdivision of the lake into a southern basin and a northern basin, the latter experiencing frequent droughts since then (Pham-Duc et al., 2020). It is notably this episode that allowed the narrative of "Lake Chad disappearing" to become established (Magrin, 2016). However, scientific data show that between 2001 and 2018, despite uneven annual recharge depending on climatic conditions, the southeastern basin remained stable, and even slightly increased in area, while the northern basin recorded a moderate decrease (Dupuy-Maury, 2020). Thus, **since 2000, the lake has not disappeared, and its surface waters recover their volume and extent seasonally** (Pham-Duc et al., 2020).

Figure 2 – Total water stock of Lac Chad



This graph, taken from the Shoring Up Stability report produced by Adelphi, shows that the storage of Lake Chad's surface water remains stable despite fluctuations. The measurements of total water stock (black line) include both surface water and groundwater (Vivekananda et al., 2019).

Although Lake Chad is not disappearing, **the region and local populations are nonetheless affected by climate change**, particularly by variations and fluctuations in rainfall patterns (Sylvestre et al., 2024).

These manifest as brief but intense rainfall events, causing major floods that disrupt food systems and contribute to population displacements (Kamnitzer, 2025).[28]

The instrumentalization of the narrative of the "disappearing Lake Chad": water vulnerability serving political and economic interests

The use of the narrative that Lake Chad is disappearing and is the cause of insecurity in the basin region is first and foremost a form of "organized ignorance" (Daoust and Selby, 2022, p.13). It is important to highlight the lack of rigor among certain scientific and political communities, which failed to verify the data being used. The use of this narrative relies in fact on the use of erroneous figures and faulty graphical and visual representations (Magrin, 2025). This process is reinforced by the constant repetition and dissemination of the narrative by figures of authority, both scientific and political (Sayan, 2025). However, the propagation of this narrative is also the result of a deliberate effort to set aside scientific evidence that contradicts the political orientations and priorities of certain regional and international actors (Magrin, 2016; Daoust and Selby, 2022, pp.13-15; Daoust, 2025; Magrin, 2025). Indeed, **the narrative of the "disappearing Lake Chad" has been instrumentalized to serve political and economic interests through several discursive processes**: climatization[29], securitization, and issue-linkage. These manoeuvres have been employed by state and institutional representatives, but also by private actors.

This narrative was first subjected to "climatization" at the beginning of the 2000s. An article by Michael Coe and Jonathan Foley (2001) predicted the disappearance of the lake due to climate change and irrigation withdrawals. It was widely cited in several reports and then relayed by regional representatives (particularly the Chadian government and the Lake Chad Basin Commission) and the media. However, this thesis was due to a misinterpretation of hydrological models, which the authors orally acknowledged after publication. Yet neither the authors nor the journal issued a correction (Daoust and Selby, 2022; Magrin, 2025). **The supposed disappearance of Lake Chad was subsequently subjected to a process of securitization, explicitly linking the lake's disappearance to regional insecurities**, notably Boko Haram from 2013–2014 onward. This framing was initially formulated by Nigerian representatives, then disseminated through the media, and later adopted by state and institutional representatives within international bodies (notably the United Nations Framework Convention on Climate Change and the Security Council), as well as by private actors (Sayan et al., 2020; Daoust and Selby, 2022).

These two discursive manoeuvres initially had the effect of elevating hydric vulnerability in the Lake Chad region to an issue of international significance. The narrative was thus mobilized by proponents of climate security (notably Sweden and Germany) to advance climate change on the United Nations agenda, including the Security Council. They were also used by certain French political representatives,

[28] Furthermore, the rise in temperatures, combined with the lake's shallow depth, promotes the expansion of vegetation cover, which hinders water circulation (Vivekananda et al., 2019).
[29] This term refers to the process through which a security issue is constructed as being related to, or even caused by, climate change (see Oels, 2012).

particularly in the context of COP21 in 2015, to serve foreign policy objectives. In a region where France's presence, within former colonies, has always been subject to criticism[30] (paternalism, neo-colonialism), these discursive manoeuvres constituted a renewed tool for managing France's relations with regional leaders. Their goal was to reconfigure the image of France's ties with its former colonies, framing them within a logic of cooperation around combating climate change (Daoust and Selby, 2022)[31].

At the regional level, "climatization" was initially employed (2006–2008) with the objective of greening by the Chadian state, in order to strengthen its legitimacy while facing attempts at rebellion (Magrin, 2025). Later, the Nigerien authorities undertook **the securitization of hydric vulnerability and the climatization of the security situation to depoliticize the security context and avoid responsibility** (Daoust and Selby, 2022): by presenting the consequences of climate change on Lake Chad as the origin of Boko Haram, public authorities obscure their responsibility for the security situation, particularly the role of social and economic inequalities (Watts, 2018). A similar dynamic is observed in the case of the Lake Chad Basin Commission (LCBC), which, by blaming climate change for the hydric situation in the region, distances itself from the poor management of water resources (Sayan, 2025), while also seeking to justify its role and usefulness (Magrin, 2025). Finally, **these discursive manoeuvres aimed to attract funding from international donors** (international organizations, development banks, states) for studies leading to action plans and a large-scale water transfer infrastructure project intended to "save" Lake Chad (Magrin, 2016; Abuja, 2021; Daoust and Selby, 2022; Sayan, 2025; Magrin, 2025).

These first two discursive processes were accompanied by the construction of links between the hydric vulnerability of the Lake Chad region, intra-continental migration issues (towards Europe), and the humanitarian situation. This issue-linkage process was particularly employed by the Italian company Bonifica and Italian state representatives in promoting the Transaqua project. This project proposes to address the disappearance of Lake Chad by constructing a canal to enable inter-basin water transfer from the Congo River to Lake Chad (Sayan et al., 2020). **The narrative of Lake Chad as "disappearing" was thus instrumentalized to feed "a study industry"** (Magrin, 2025) and to attract financial support for the implementation of the Transaqua construction (Sayan, 2025; Magrin, 2016). Furthermore, presented as a response to the disappearance of Lake Chad being responsible for insecurity, the Transaqua project would also constitute an opportunity for Italy to increase its presence in the region and to pursue its national security political objectives, which identify terrorism and migration as security threats (Sayan et al., 2020).

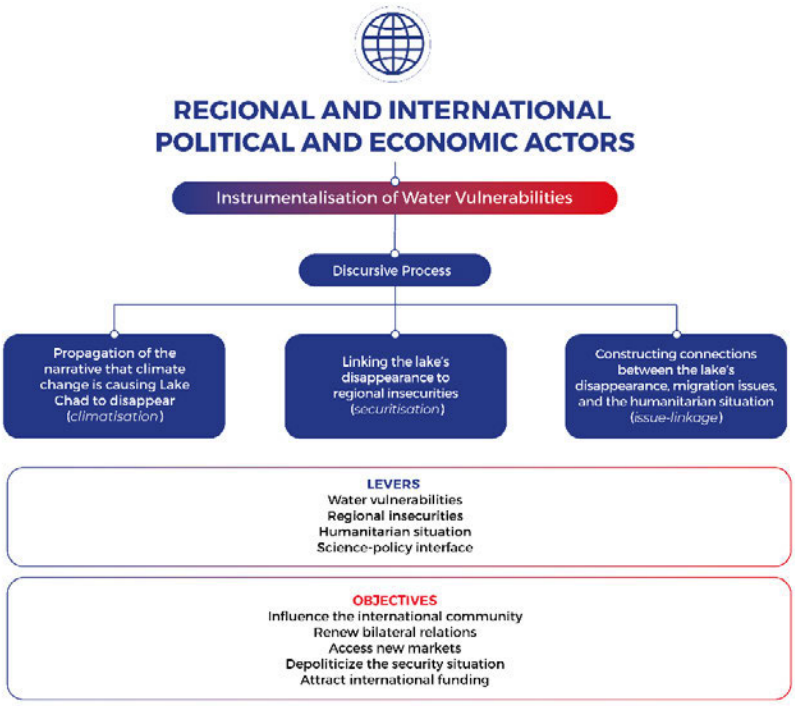
This case study first shows how false scientific data circulated widely and contributed to creating a myth of climate security, still invoked today in media and political discourses. But **it primarily reveals deliberate choices aimed at disregarding scientific data that contradicted certain political and**

[30] Criticism of France (paternalism, neo-colonialism, etc.), and particularly of its military presence, intensified throughout the 2020s, ultimately leading to the termination of Operation Barkhane (2022) and the expulsion of French armed forces from Niger (2023) and Chad (2025).

[31] Researchers Gabrielle Daoust and Jan Selby cite excerpts from official speeches by French Presidents François Hollande (2012, 2015) and Emmanuel Macron (2017) to illustrate these reconfigurations (pp. 23–24).

economic orientations. The narrative of "Lake Chad disappearing" was thus instrumentalized within the region's conflict dynamics as a tool of influence and optimization of political and economic gains. Regional, international, public, and private actors resorted to discursive manoeuvres to advance their interests. Accordingly, **this case study demonstrates how supposed hydric vulnerabilities are integrated into the action repertoires of public and private actors.** Furthermore, this instrumentalization largely obscured the true effects of climate change in the region, thereby delaying the implementation of appropriate political responses.

Figure 3 – The "Disappearing Lake Chad" Narrative as a Strategic Lever



Changes in weather and climate: what potential for instrumentalisation?

In the context of increasing global climate insecurity, manifested through a rise in meteorological and climatic hazards, several **adaptation solutions** are being considered. Among these is the **use of engineering practices aimed at modifying the weather or climate**. Beyond their effects on natural and social systems, these techniques can also be used as strategic levers by states.

The main **weather modification technique** is **cloud seeding**, which involves dispersing chemical particles to induce precipitation or limit hail. Deployed in nearly fifty countries for civil purposes, notably agriculture, **some recent uses illustrate the instrumental potential of these practices**: China employs them to strengthen its water security and support its regional ambitions, particularly in the context of its rivalry with India over shared water resources (de Guglielmo Weber and Jash, 2025).

On a broader scale, **climate modification techniques**—grouped under the term climate geoengineering—aim to mitigate climate change or reduce its effects. These techniques either extract CO2 from the atmosphere (carbon dioxide removal – CDR) or compensate for the increase in global mean temperature by reducing the solar radiation absorbed by the Earth (solar radiation management – SRM). While CDR techniques are already integrated into climate scenarios and mitigation strategies of numerous public and private actors, SRM remains largely controversial even as initial experiments begin. **It is also deeply embedded in the dynamics of great power rivalries, and it is conceivable that SRM could be instrumentalized**—particularly as a tool for preservation, protection, or negotiation (De Guglielmo Weber et al., 2023).

Despite significant differences in objectives, as well as temporal and spatial effects, the use of weather and climate modification techniques (SRM) may generate tensions between states, linked to the environmental consequences of their deployment and the attribution of events in a territory to the intervention of a third party. Moreover, the inability to prove the origin of disruptions experienced in a territory could allow actors to position themselves as victims and thus justify political responses, including military ones (De Guglielmo Weber et al., 2023). **These techniques—and their real or perceived consequences—can therefore be instrumentalized** in a context already marked by observable manoeuvres of disinformation and information manipulation following extreme climate events (Chauvet, 2024), as well as practices of information withholding (Guglielmo Weber and Jash, 2025; see the case study on the India-Pakistan conflict).

B. The Use of Agri-food Vulnerability as a Strategic Lever

1. Agri-food dependencies as a factor of vulnerability

Agri-food resources play a central role in the construction and sustainability of human societies. However, the globalization of agri-food systems[32], combined with the effects of anthropogenic climate change, weakens both the production and distribution of agri-food resources. **Rising temperatures, increasing droughts, storms, and other extreme climatic events reduce agricultural yields and disrupt global supply chains, contributing to the emergence of growing agri-food vulnerability among populations and territories** (Intergovernmental Panel on Climate Change, 2023; FAO, 2023). The scarcity of agri-food resources and dependence on global supply chains can lead to tensions over resource access and generate competitive dynamics, or even conflicts of various types and intensities (Action Against Hunger, 2025; Kohler, 2020; De Waal, 2024; Mudie-Mantz and Werz, 2025).

Moreover, **high-intensity conflicts constitute one of the main contemporary drivers of food insecurity[33], as they disrupt the entire value chain of agri-food systems** (*Action contre la faim*, 2025; *Haut-Commissariat aux droits de l'Homme*, 2023). Conflicts are first likely to paralyze agricultural production by forcing populations, including agricultural labour, to move in order to flee combat zones or seek refuge elsewhere (Odozi et Uwaifo Oyelere, 2021). Next, clashes can lead to the destruction of essential infrastructure or food reserves (Kondylis, 2008). Conflicts also disrupt local markets: difficulties in supplying raw materials or staple products lead to price increases, further weakening the livelihoods of inhabitants. When a territory occupies a strategic position in a global value chain, these disruptions can ripple far beyond its borders and affect international markets (Countryman et al., 2025).

Beyond the repercussions of conflicts on the value chain of agri-food systems, several recent conflicts – in Gaza, Yemen, Ukraine, or the Democratic Republic of Congo – **show that agri-food vulnerabilities, notably those amplified by the harmful effects of climate change, can be exploited as strategic levers** in the context of armed confrontations and hybrid warfare (Cohen et Messer, 2024 ; Denieulle, 2023 ; Collingham, 2011 ; Del Duca, 2024). Thus, we propose to examine two case studies illustrating the continuum of use of these climate vulnerabilities in contemporary conflict contexts within the framework of the Yemeni civil war and the Russo-Ukrainian war. The selection of these cases is based on three main criteria: their capacity to illustrate the effects of climate change on agri-food systems, the diversity of modalities for strategic exploitation of these vulnerabilities, sometimes combined, and the presence of marked conflict dynamics in the territories studied.

[32] The term "agri-food system" refers to all processes and actors involved in agricultural production, as well as those upstream (banks, agrochemical industries, seed companies) and downstream (processing, packaging, logistics, and marketing) of the production process (adapted from Jean-Benoit Bouron, 2025).
[33] A situation in which regular access to sufficient, safe, and nutritious food for normal growth, development, and an active, healthy life is not guaranteed. It is based on four pillars: the availability of resources, their accessibility, their proper utilization, and the stability over time of these first three pillars (FAO, 2008).

The two case studies presented in this section illustrate the main modalities of strategic use of agri-food vulnerabilities in a conflict context. On the one hand, they show different practices that fall along the *continuum of instrumentalization–weaponization,* used jointly to achieve military and political objectives in both conflict settings: limiting the access of Yemeni populations to agri-food resources to push them to support one side or the other, and systematically destroying the production, transport, and distribution infrastructures of Yemeni and Ukrainian agri-food resources. On the other hand, the belligerents seek to achieve foreign policy and influence objectives: the Kremlin has instrumentalized the dependence of many countries on Ukrainian grain imports, some particularly vulnerable to climate change, as a strategic lever.

2. Case Study 1: The instrumentalization and weaponization of agri-food vulnerabilities in the Yemeni civil war

The Yemeni civil war: an asymmetric and regional conflict

The conflict between the Sunni Yemeni government and the Shiite Houthi rebels is rooted in the country's political history and has gradually transformed into an open war involving multiple regional and international actors. Its origins date back to the reunification of present-day Yemen in 1990, but it truly took shape in 2004 when rebels from the northern part of the country initiated demonstrations and violent clashes against the central government. In 2014, insurgents from the group known as the "Houthis" or Ansar Allah took control of Sanaa, the capital and largest city of Yemen, demanding a reduction in fuel prices and a new government, inspired by the Arab Spring movement (Council on Foreign Relations, 2025; Carboni, 2025). The failure of negotiations led to the outbreak of a high-intensity conflict between the Houthis, supported by Iran and briefly by forces of the former president, and the troops of the incumbent president and his government. The latter were backed by the military coalition "Operation Decisive Storm," composed of Saudi Arabia and other regional states such as the United Arab Emirates, Egypt, and Sudan, and supported by the logistical and strategic resources of the United States and the United Kingdom (United Nations High Commissioner for Refugees, 2025).

Despite several attempts at ceasefires and negotiations, the conflict remains largely stalemated today, marked by territorial fragmentation and a severe humanitarian crisis. Added to the asymmetric configuration and territorial separation between the two main parties to the conflict is a multiplication of fronts. These characteristics highlight the parties' interest in resorting to the militarization of agro-food vulnerabilities within the conflict, amplified by the effects of climate change on Yemen's agricultural sector (Mundy, 2018; Ekstrom, 2020; Al-Deen, 2022).

The effects of climate change and extractive policies on Yemen's agricultural sector: the construction of structural agri-food vulnerability

Yemen's agricultural sector has undergone profound restructuring over the past twenty years due to certain public policies and climate change. As early as the 1970s, the area of arable land significantly decreased, a consequence of economic choices favouring the exploitation of new oil resources at the

expense of agriculture (Al-Eryani, 2021). A large portion of the agricultural workforce had then left farms for higher-paying jobs in the oil sector. Between 1970 and 2000, the area dedicated to cereal crops thus decreased by 42% (Ajl, 2018).

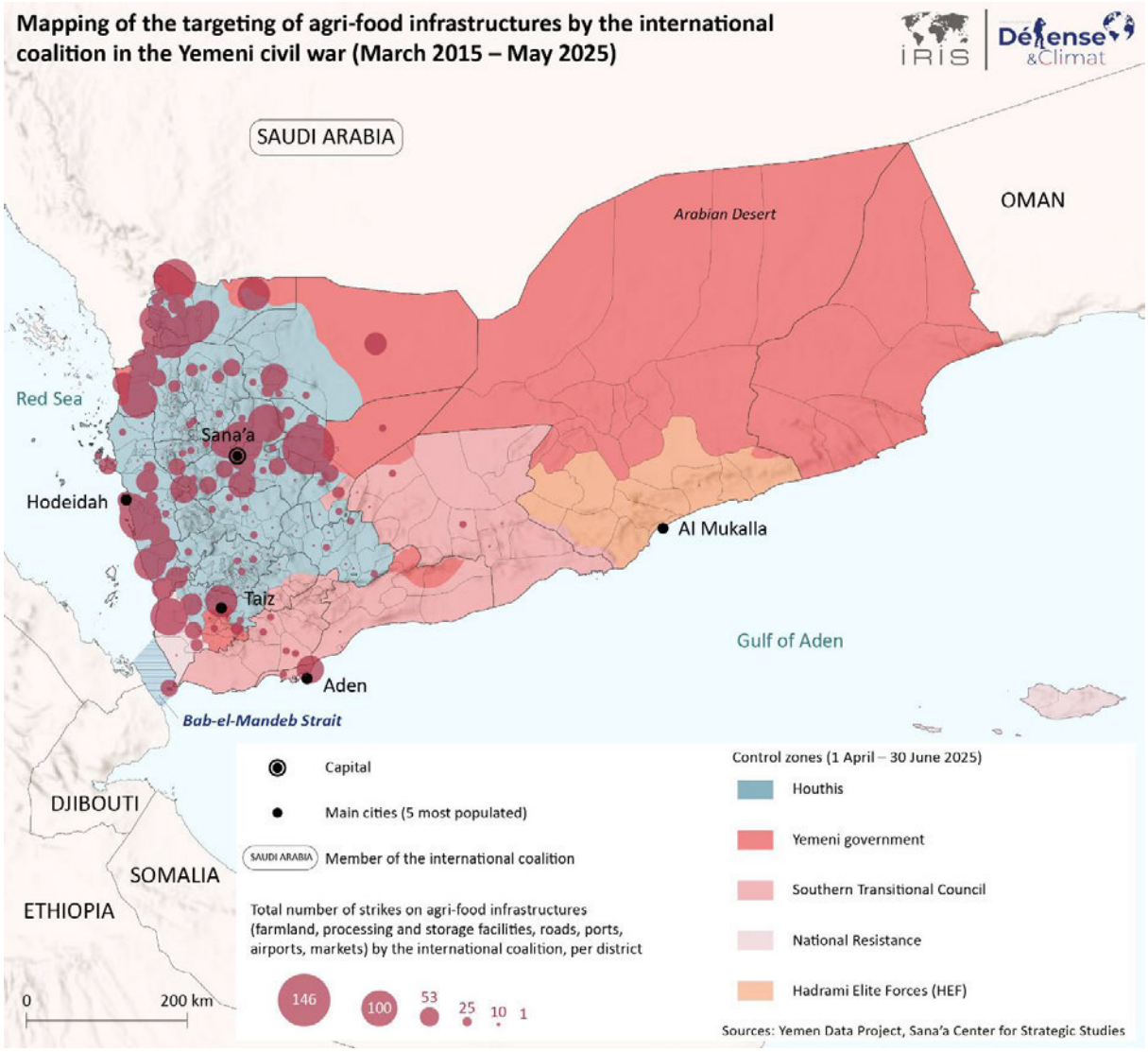
Furthermore, **the scarcity of water, essential for irrigation, constitutes one of the main challenges in a country already subject to a desert climate** (Banque Mondiale, 2023). The decline in rainfall, particularly on the western and southern coasts, combined with the increasing frequency of extreme climatic events, places the country today as the 7th most affected globally by water scarcity (YFCA Research Unit, 2023). Repeated droughts and rising temperatures reduce agricultural yields, directly impacting the food security of the population (Lewis et Monem, 2018; FAOSTAT, 2023). The alternation between cyclonic periods and droughts leads to direct livestock loss, soil erosion, and the drying up of groundwater used for irrigation (Banque Mondiale, 2010). This alternation also causes flooding, since in the case of heavy rainfall, overly dry soils are unable to absorb the water (Sana Center for Strategic Studies, 2024).

The effects of climate change on other agricultural regions in the world also have repercussions on the Yemeni agri-food system, which is highly dependent on supply chains. The global increase in food prices, particularly pronounced since 2022, affects the Yemeni population, as 70 to 85% of consumed food is imported (*Organisation internationale pour les migrations* et al., 2023; FAO, 2024; Lackner, 2019).[34]

Under the combined effect of national and global factors, the agricultural sector gradually lost its central role in the Yemeni economy. This contributed to the creation of a structural food vulnerability, which favoured the emergence of tensions and the weaponization of this vulnerability in the conflict (Khalil et Thompson, 2024; Sana Center for Strategic Studies, 2024; Yemen Policy Center, 2021). Arable land has covered only 2–3% of the territory since 2014, a decline that intensified rivalries among local actors over available resources (Banque Mondiale, 2024). These tensions already existed before the 2015 civil war and were expressed locally in the form of usage conflicts between villages over access to water or land (Hales, 2010; Alaghbari, 2022). Even before the outbreak of the high-intensity conflict, 41% of the population was in a situation of food insecurity. The weakness of the agri-food system and pre-existing tensions thus favoured its strategic use as a weapon of war starting in 2015 (Mwatara for Human Rights, 2021).

[34] Wheat, imported in various forms, accounts for more than half of the country's imports. Other commodities follow, including maize, soybeans, beans, rice, and sugar. The main exporting countries are Russia, the United States, and Australia, which replaced Ukraine following the Russian invasion in February 2022 (ACAPS, 2023).

Map 2 – Mapping of the targeting of agri-food infrastructures by the international coalition in the Yemeni civil war (March 2015 – May 2025)



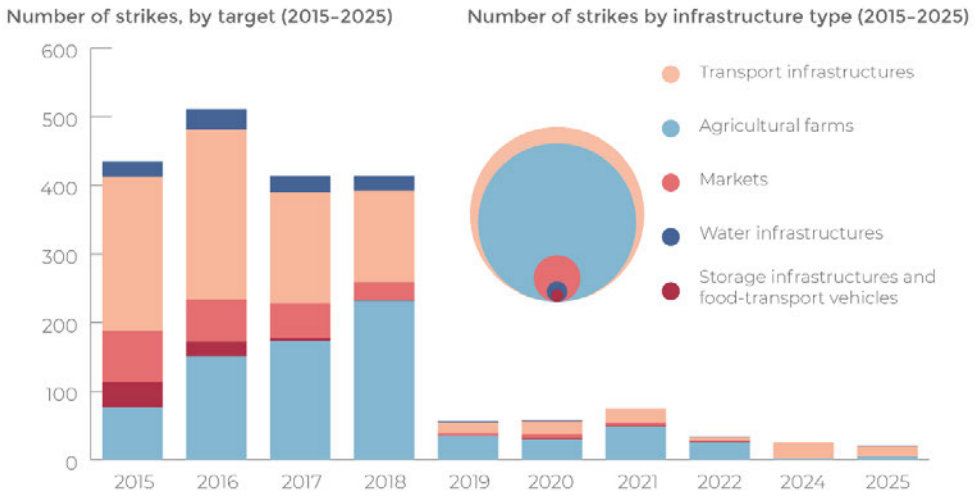
The weaponization and instrumentalization of agri-food vulnerabilities in the Yemeni civil war

The strategic exploitation of the structural vulnerabilities of the Yemeni agri-food system in the context of the civil war has manifested in the **systematic targeting of agricultural and food infrastructures by the pro-government international coalition** – which amounts to an weaponization of these vulnerabilities – as well as a series of actions aimed at instrumentalizing food resources in the conflict, notably by reducing the population's disposable income for purchasing them.

First, the international coalition supporting the Yemeni government gradually oriented its military strategy toward the deliberate disruption of food production through the systematic destruction of farmland and agricultural infrastructures. Available data indeed indicate an evolution in the nature of the targets struck by the coalition's air campaigns. At the start of its engagement alongside the government in March 2015, airstrikes carried out by Saudi Arabia focused on military targets, following

the progression of Houthi rebels across the territory. However, from June 2015 onward, strikes also targeted farms (livestock and agricultural production) and other agricultural infrastructures, notably in the governorates[35] of Hudaydah, Hajjah, and Sa'da, under Houthi control (see Map 2 and Figure 4).

Figure 4 – Evolution of the targeting of agri-food infrastructures by the international coalition in the Yemeni civil war (March 2015 – May 2025)



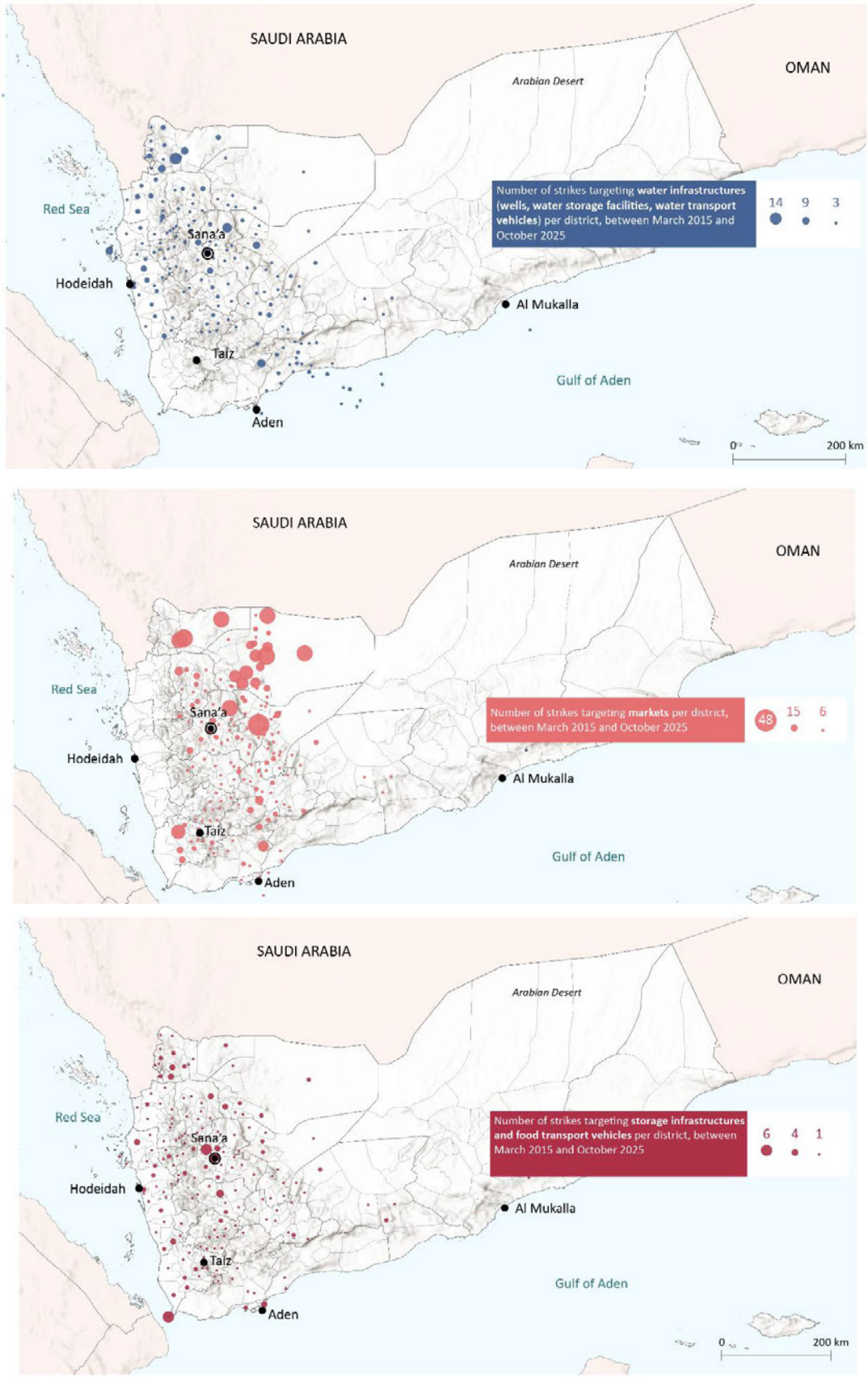
Sources: Yemen Data Project

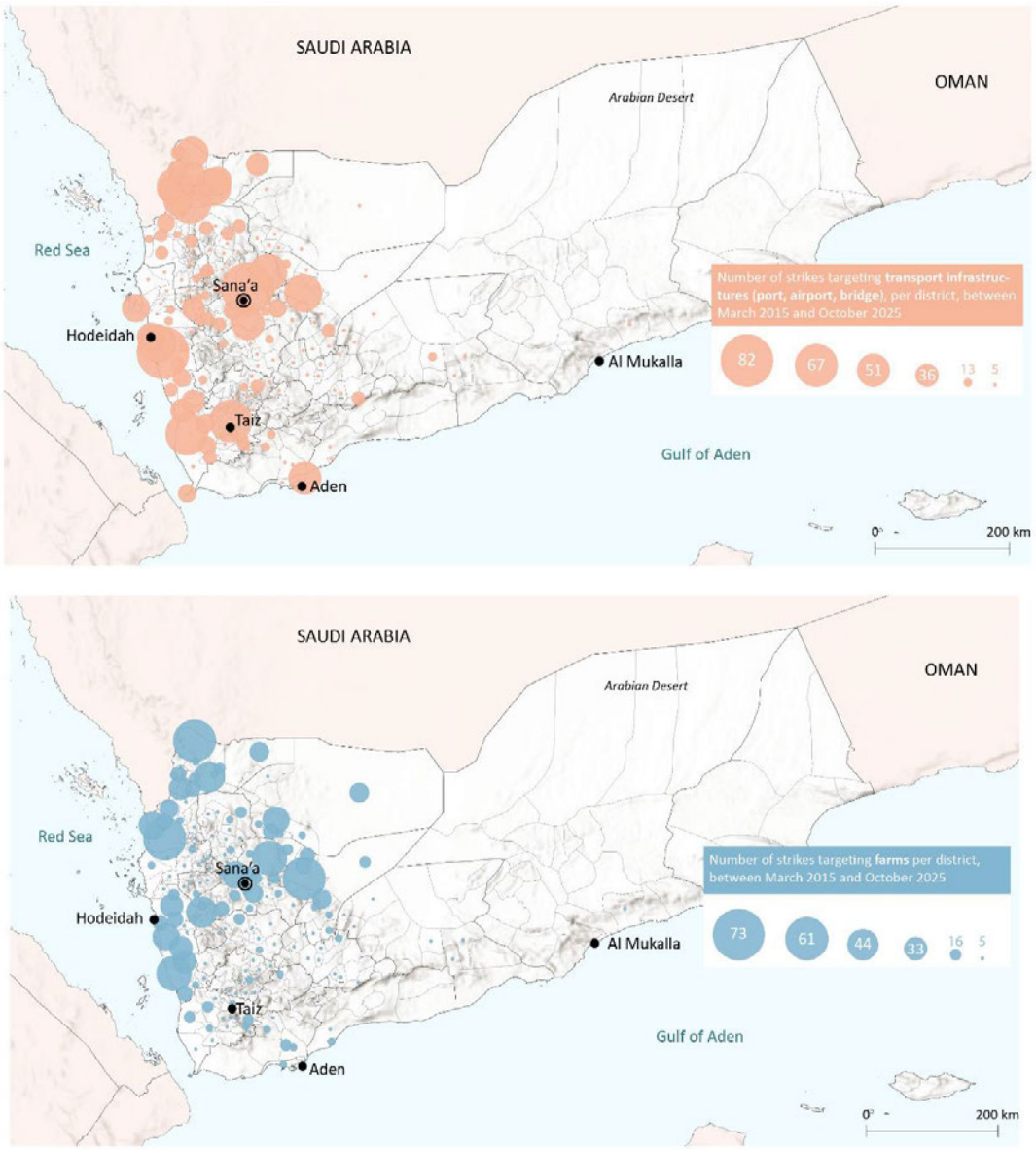
In total, 1,995 Saudi airstrikes and 46 American and/or British airstrikes have been recorded on Yemeni agri-food system infrastructures (farms, storage facilities, ports, airports, roads, transport vehicles, markets) since the beginning of the civil war in 2015 (Yemen Data Project, 2025[36] ; Mwatara for Human Rights, 2021 ; Ekstrom, 2020) (see Map 3).

[35] There are 22 administrative subdivisions in Yemen, called governorates since the 2004 partition, which are further divided into districts, sub-districts, and municipalities.

[36] The Yemen Data Project is an independent data-gathering initiative aimed at collecting and disseminating information on the war in Yemen. The data team is composed of Yemenis who have received extensive training in data collection, research, and coding. The data collectors have also undergone external training on data collection and analysis methods provided by ACLED (Yemen Data Project, 2025).

Map 3 – Mapping of the targeting of agri-food infrastructures by the international coalition in the Yemeni civil war, by type of infrastructure (March 2015 – May 2025)





Sources: Yemen Data Project, Sana'a Center for Strategic Studies

Since the agricultural lands, already weakened by the effects of climate change, represented only a small portion of the territory, the strikes targeting them were interpreted by observers as one of the main means of weaponizing agri-food vulnerabilities by the pro-government international coalition, potentially constituting war crimes[37] (Mundy, 2018; Sowers and Weinthal, 2021; Fisk, 2016). On the opposing side, a report also mentions agricultural destruction by the Houthis, who placed mines on

[37] A report by the United Nations High Commissioner for Human Rights denounces airstrikes as "likely to constitute war crimes." See United Nations High Commissioner for Human Rights (2019), *Situation of human rights in Yemen, including violations and abuses since September 2014 – Report of the Group of Eminent International and Regional Experts submitted to the United Nations High Commissioner for Human Rights*, A/HRC/42/17.

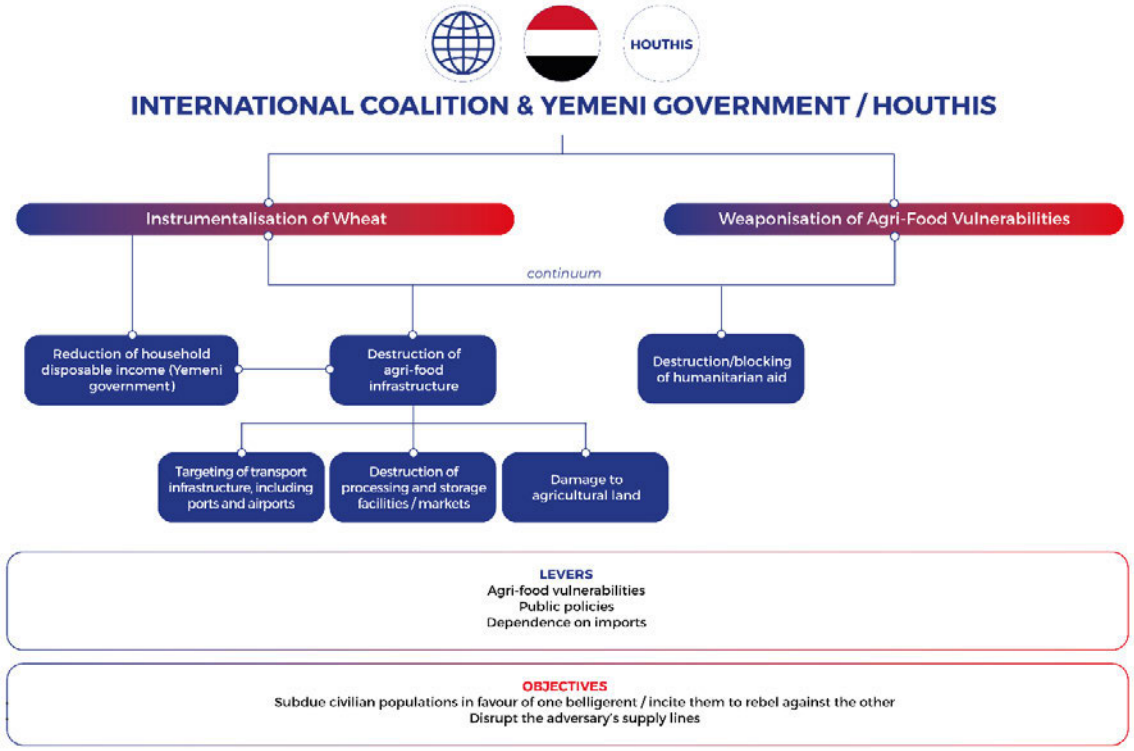
cultivated or grazing lands to destroy both the land and agricultural labour (Mwatara for Human Rights, 2021).

Secondly, all parties to the conflict resorted to the destruction, diversion, or blockage of humanitarian aid, in logics that were sometimes related to weaponization and sometimes to instrumentalization, in order to disrupt the supply of food resources to populations living under enemy control. The Houthi rebels thus prevented humanitarian actors from accessing the Red Sea Mills silos near the port of Al-Hudaydah, the country's main port, resulting in the loss of the resources stored there. These facilities previously contained enough wheat to feed 3.7 million people for one month, representing a quarter of the World Food Program stocks in the country, a crucial resource since it is not locally produced due to the global rise in temperatures (ACAPS, 2023). **Furthermore, all parties to the conflict resorted to obstructing the distribution of humanitarian aid** by setting up paid checkpoints, conducting inspections with long delays, and destroying roads used to deliver aid. In the Taiz governorate, the Houthis temporarily besieged certain urban areas and blocked the entry of humanitarian aid, thus using food deprivation as a tool to weaken the resistance of the population or to push them to turn against the forces administering them – national resistance forces allied with the government (Mwatara for Human Rights, 2021; Alley & Hiltermann, 2017).

Thirdly, the Yemeni government deliberately weakened the purchasing power of local populations, thereby reducing their access to food, in order to push them to submit to its authority or to rebel against the Houthis in territories under their control (Bachman, 2019). For public sector employees, this loss of purchasing power was particularly linked to the deliberate cessation of salary payments starting in August 2016 (Alley & Hiltermann, 2017; HumanAppeal, 2018). While food security was already a concern prior to the conflict, some observers consider that famine is not only a consequence of the conflict, but that agro-food vulnerability has been used as a strategic lever (United Nations High Commissioner for Refugees, 2025; Mundy, 2018). Concurrently, the rapid depreciation of the Yemeni riyal, due to market panic in response to the political crisis and the high-intensity conflict shaking the country, caused food prices to skyrocket, increasing by more than 400% in certain regions compared to the pre-conflict period, combining inflation and resource scarcity (World Food Program, 2024; International Committee of the Red Cross, 2023).

The study of Yemen shows how agro-food vulnerabilities, exacerbated by climate change, can be used as strategic levers in different ways within a conflict, illustrating the continuum of instrumentalization–weaponization of climate vulnerabilities. In this case, weaponization is manifested through the systematic targeting of agro-food infrastructure, while instrumentalization consists of manipulating access to resources either through their withholding or indirectly by impacting the populations' purchasing power to induce their submission or rebellion against the opposing side.

Figure 5 – The Weaponisation and Instrumentalisation of Agri-Food Vulnerabilities in the Yemeni Civil War



3. Case Study 2: Cereal resources – instrumentalization and weaponization of wheat in the context of the Russia–Ukraine war.

The Russia-Ukraine war

On 24 February 2022, **Russia launched a large-scale military invasion of Ukraine**, following eight years of heightened tensions caused by the Russian annexation of Crimea in 2014 and the conflict in the Donbass. The Kremlin claimed it aimed only to ensure its own security[38], but for many analysts, this unlawful aggression primarily sought to rapidly overthrow the Ukrainian government and install a pro-Russian regime (Mankoff, 2022).

In early 2022, Russian forces advanced quickly into Ukrainian territory, but resistance formed across the country, supported financially, militarily, and politically by the United States, the EU, and their allies. The first months of the war were marked by intense fighting in Mariupol, Kharkiv, Kherson, and

[38] On February 24, 2022, Vladimir Putin spoke on Russian television to justify the "special operation" that had just begun in Ukraine. In addition to the serious accusations against the Ukrainian government of committing genocide against the Russian-speaking populations in the east of the country, Russia accused NATO, the United States, and their allies of posing a threat to its security: "They have left us no other option to defend Russia and our people than the one we are compelled to use today" (President of Russia, 2022, translated by the author).

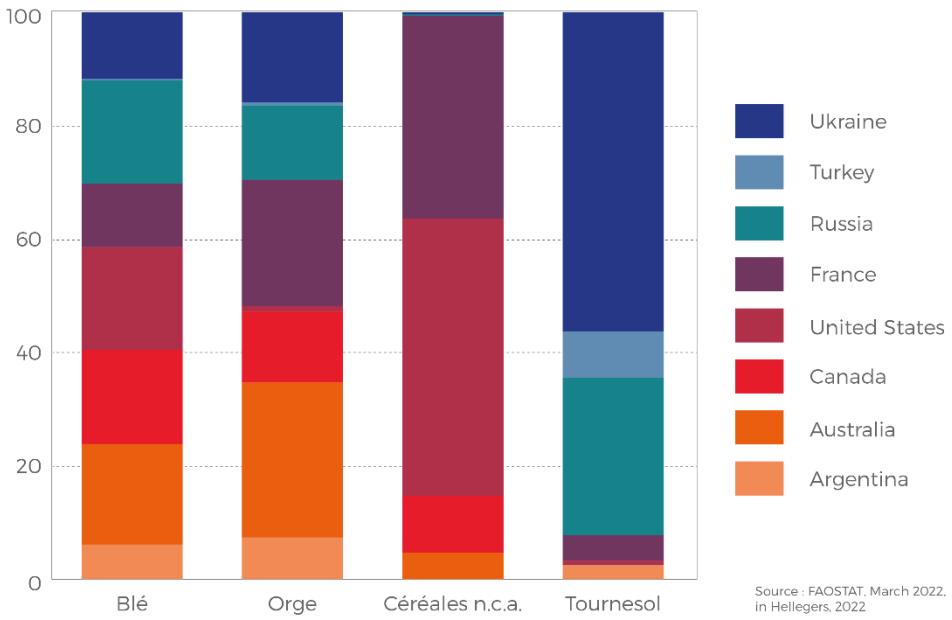
around Kyiv, resulting in the deaths of around 5,000 civilians (United Nations Human Rights, 2022, April 19).

Three years later, the war continues in the southeast of the country. Military and civilian losses are substantial, particularly for Ukraine, where the population suffers daily bombardments. Repeated diplomatic efforts to obtain a ceasefire and launch a peace process have consistently failed. **Beyond the national and regional consequences—military as well as diplomatic—the invasion of Ukraine has also placed strong pressure on global energy systems**[39] (International Energy Agency, 2022) **and food systems**[40] (Bernard, 2023).

Wheat in the Russia-Ukraine Conflict: A Major Economic Resource, but Vulnerable to Climate Change

Russia and Ukraine are two major agricultural powers and accounted for around 30% of global wheat exports in 2020, ahead of the United States and Canada (around 12% each) and France (around 8%) (Hellegers, 2022) (see Figure 6). The two belligerents also supply a significant share of the world's barley (around 25% in 2020) and the majority of globally traded sunflower oil (44% for Ukraine and 20% for Russia in 2020) (Hellegers, 2022). However, in February 2022, the Russian invasion of southern Ukraine obstructed access to the Black Sea, the main export route, resulting on the one hand in the **collapse of Ukrainian exports** and, on the other hand, in heightened global food insecurity by affecting the prices and availability of wheat, maize, and sunflower oil (UNICEF, 2023).

Figure 6 – Shares (%) of Ukraine, Russia, and other major exporting countries in key exports, 2020



[39] Russia's invasion of Ukraine triggered a global energy crisis, exposing the fragility and unsustainability of the current energy system. Energy markets were destabilized, and gas and oil prices surged, particularly in Europe, where dependence on Russian gas was high. This crisis accelerated the transition to renewable energies and pushed governments to rethink their energy security (International Energy Agency, 2022).

[40] The invasion of Ukraine triggered a surge in the prices of cereals and agricultural inputs, worsening global food insecurity: in 2022, cereal prices rose by 48%, and nearly 345 million people across 82 countries faced acute food insecurity—200 million more than before the pandemic (Bernard, 2023; UN Women, 2022).

Anthropogenic climate change is already affecting Ukrainian agriculture, and its impacts are expected to intensify in the coming decades (Golub et al., 2021; IPCC, n.d.; Oleksandr, 2024). Rising temperatures currently threaten the south and east of the country, where droughts, aridity, and increased irrigation needs—particularly in the Kherson and Zaporizhzhia regions—reduce yields of barley, maize, and sunflower on the one hand, and on the other hand make farms more vulnerable to water-related disruptions (Golub et al., 2021). Extreme climate events (heatwaves, extreme precipitation, riverine floods) cause crop losses and exacerbate the erosion of Ukraine's famous black soils (or t*chernozioms*[41]), among the most fertile soils in the world. By 2050, yields of major crops such as barley, maize, and sunflower are expected to decline, while winter wheat could temporarily see productivity increase in the north and northwest compared to 2010—particularly because rising temperatures lengthen the seed growing season (Golub et al., 2021).

A Logic of Weaponization: The Use of Wheat as a Military Target

The use of wheat as a strategic lever by Russia since the invasion of Ukraine illustrates how a single actor can mobilize a variety of techniques along the *instrumentalization–weaponization continuum* to achieve different objectives across multiple territories. Indeed, the Russian strategy is part of a global and multidimensional approach with **several strategic, political, and economic objectives: to carry out the war against Ukraine by significantly weakening its adversary and to expand its influence in Africa and the Middle East**. Alongside the Kremlin's use of energy as a major tool of its hybrid warfare strategy[42] (Summers & Goodman, 2020), cereals, and agri-food resources more generally, have not only been instrumentalized in this conflict to influence or even coerce partner countries in Africa and the Middle East, but also weaponized—that is, used as material targets to weaken the Ukrainian economy**.**

The agri-food sector is one of the engines of the Ukrainian economy, generating 15% of its GDP and employing 20% of the workforce before 2022 (*Direction générale du Trésor*, 2021). The **agri-food system therefore became a primary target for Russia across its entire value chain**: Russian forces carried out **systematic bombings of agricultural areas and critical production, storage, and transport infrastructure** (Euronews, 2024), preventing the export of foodstuffs. They also seized **agricultural land:** the first wave of Russian conquest deprived Ukraine of a quarter of its arable land, used for maize in the north and for wheat in the southeast (Wegren, 2023). Russia also quickly initiated the exploitation of the annexed lands and organized the theft and subsequent sale of Ukrainian wheat through various clandestine networks (Faucon, 2024). This set of actions allows us to assert that Russia has **weaponized cereal resources** in this conflict.

[41] See definition in the glossary
[42] Moscow notably used energy as a strategic lever, reducing or cutting its gas deliveries to Europe in order to economically weaken the EU and influence its financial, military, and political support for Ukraine (Falkner, 2023).

The Russian strategy in Africa and Middle East

Russian influence has gained ground across Africa and the Middle East in recent years, following a logic of transactional relations in the military, economic (mining and energy), and political domains. Moscow's main objective is to secure growing support for its vision of a multipolar world order, partly based on weakening Western influence (Ferragamo, 2023; Hamzawy, 2024). This support is reflected through votes in its favour at the United Nations (Ferragamo, 2023; Daly, 2023). On both continents—with, of course, specific characteristics unique to each region and country that this note cannot detail—**Russia actively promotes its economic interests, theorized as a form of "economization" of Russian foreign policy, which is articulated alongside an "energy diplomacy" (Facon, 2017) and a military presence** (Ferragamo, 2023; Lovotti & Talbot, 2019; Daly, 2023). On the one hand, at the military level, Moscow develops arms trade (with Egypt, Iran, and Algeria, for example) and expands its presence through the establishment of Russian military bases, notably in Syria and Libya, and soon in Sudan (ISPI, 2025). Russia is also active unofficially through the deployment of the Africa Corps group (formerly the Wagner Group), Russian paramilitaries tasked, among other things, with training the armies of several Sahel countries: Mali, Niger, Burkina Faso. Furthermore, although Russian economic involvement in Africa remains modest compared to that of China or the West, Russian public and private companies seek to conclude agreements, particularly to gain new markets and develop mineral and hydrocarbon trade (Robert Lansing Institute, 2025). Russian agricultural exports are part of this broader economic strategy of conquering new markets. Finally, this strategy relies on an **information offensive** aimed at strengthening the legitimacy of the Russian presence and disseminating an anti-Western narrative through numerous channels (state media, social networks, local intermediaries, etc.) (Erameh & Bamidele, 2025).

The Instrumentalization of Agri-Food Vulnerabilities by Russia to Weaken Ukraine and Increase Its Influence in Africa and the Middle East

The weaponization of Ukrainian wheat has been accompanied by a Russian strategy in Africa and the Middle East aimed at substituting Ukrainian wheat imports in favour of Russian supplies. Within this framework, the Kremlin exploits, on the one hand, the global food crisis—caused by economic shocks such as the Covid-19 pandemic or the war in Ukraine, local conflicts, and climate events (UNICEF, 2023). On the other hand, Moscow takes advantage of the climatic characteristics—the adverse effects of climate change—and economic conditions of these partners—their dependence on imports—to forge or strengthen political alliances, while depriving Ukraine of export markets essential to its economy (Wegren, 2023; Petit, 2024). The Russian strategy of global control over production areas, maritime routes, and importing markets has resulted in an **unprecedented breakthrough in African markets**: in North Africa, Russian wheat exports reached 13.5 million tons in 2024/2025, representing approximately 42% of the region's imports, compared to only 25% for EU countries (United States Department of Agriculture, 2025). Before 2022, Ukraine accounted for a significant share of the region's supply—between 20 and 25% (United States Department of Agriculture, 2025)—but the invasion caused a **collapse of its exports** (maritime blockade, infrastructure destruction, difficulties exporting by land). In 2024/2025, Ukraine supplied only about 2.9 million tons to North Africa, representing merely 9% of regional imports (United States Department of Agriculture, 2025). If this trend continues, Russia could soon control nearly half of the North African wheat market, thereby

consolidating both its economic weight and its diplomatic influence in this strategically important area for military, diplomatic, and economic reasons, while also increasing these states' dependence on its exports.

Russia instrumentalizes local agri-food vulnerabilities—whether economic, political, and/or climatic—to develop wheat trade and consolidate its status as a major exporter, thereby strengthening its influence on the international stage (Kozielec et al., 2024). To do so, **Russia takes advantage of wheat's essential role in the diets of importing countries**—particularly in Africa and the Middle East, where bread has become a staple food indispensable for social and political stability (Denieulle, 2023)—and exploits these countries' dependence on cereal imports. These two factors exacerbate the capacity to instrumentalize agri-food vulnerabilities.

Indeed, North Africa and the Middle East currently represent the most wheat-import-dependent region in the world, accounting for one-third of global wheat purchases, despite comprising only 6% of the world's population. Of the 110 million tons of wheat consumed annually in this region, 65 million come from imports, making these states vulnerable to market fluctuations (Denieulle, 2023). **This dependence is explained by a combination of several factors: climatic constraints** (drought, water stress, low rainfall), **population growth and rapid urbanization** increasing wheat demand, and **historical political choices**—some governments, such as Nigeria, have prioritized imports over investment in local agriculture (Kouamé, 2025; Struna, 2022; *Fondation pour la Recherche stratégique*, 2025; Denieulle, 2023). Conflicts can also disrupt local production, and the economic specialization of certain countries—such as those in the Gulf—in hydrocarbons makes them structurally dependent on global markets for their food security.

The war in Ukraine has exacerbated these vulnerabilities: the global food price index jumped 12.6% as early as February–March 2022, due to the combined effect of rising prices for wheat, fertilizers, and vegetable oil, as well as supply chain disruptions linked to sanctions imposed on Russia. This crisis particularly affects already vulnerable countries, such as those in Central Africa (Sundjo and Kum, 2022), but also in East Africa, where **historic droughts related to climate change increase dependence on imports** (Karume et al., 2024). More than 50 countries import over 30% of their wheat from Russia and Ukraine, and among them, 15 import more than 70%, including many low-income states in the North Africa–Middle East region (NAMR) (Hellegers, 2022). States such as Egypt, Sudan, Nigeria, Tanzania, Algeria, Kenya, and South Africa—heavily dependent on Russian wheat—are thus facing heightened risks of social and political tensions (Kozielec et al., 2024).

This approach has been accompanied by a form of "grain diplomacy" (Bonnière, 2023; Maussion, 2024)—**articulated through concrete actions and discursive manoeuvres—which fits within Russia's transactional strategy aimed at enhancing its reputation in Africa.** For example, in July 2023, the Kremlin announced the free delivery of cereals to six African countries, including Burkina Faso, Mali, Eritrea, the Central African Republic, Somalia, and notably Zimbabwe, which received 25,000 tons of wheat and 23,000 tons of fertilizer during a devastating drought (Courrier international, 2025). Russia committed to delivering more than 200,000 tons of free cereals to the continent, presenting itself as

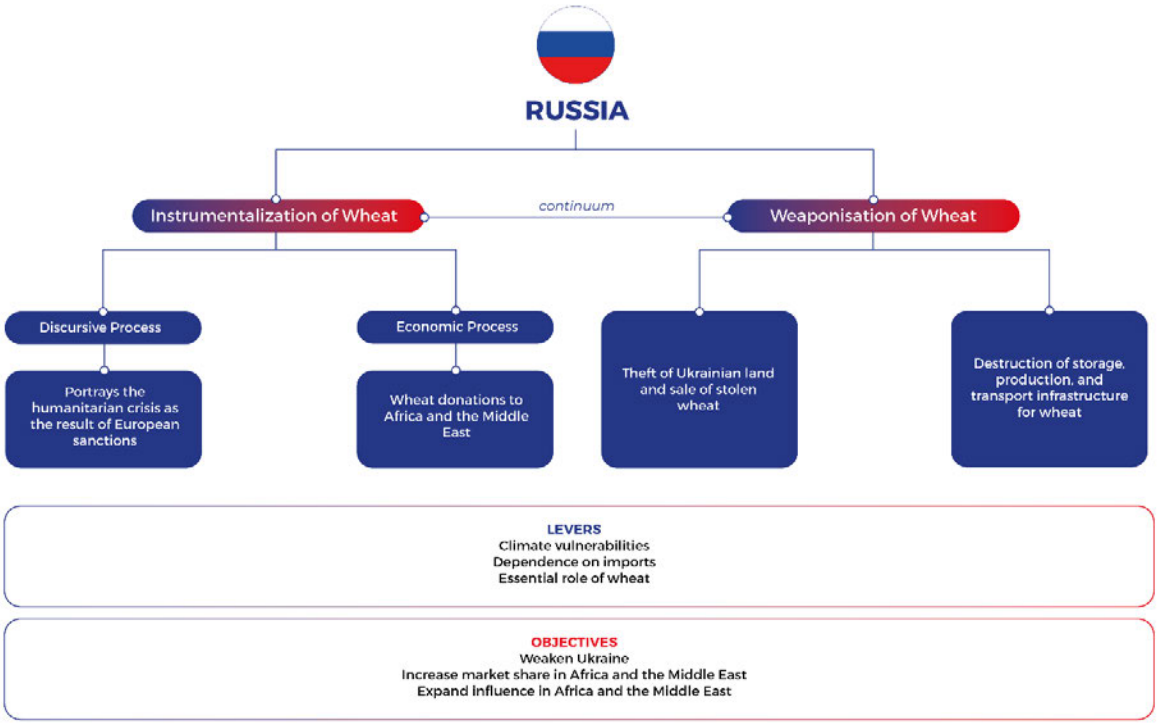
a **guarantor of food security in Africa**. However, according to some observers, this is less a humanitarian gesture than a strategic manoeuvre: rewarding allies and attracting new partners in areas key to its influence (Courrier international, 2025). These concrete actions were supported by a **discursive manipulation of the wheat crisis**, in which **Russia framed the food crisis as a consequence of Western sanctions** rather than its invasion of Ukraine. Vladimir Putin also invoked the threat of food insecurity during negotiations over the maritime corridor agreement in 2023 (Wegren, 2023). By accusing the EU and Ukraine of exacerbating global hunger[43] because leaders refused Russia's conditions[44], the Russian government uses wheat as a **means of pressure**. Conversely, Ukrainians and Western leaders accuse Russia of **weaponizing food**[45].

By directly targeting Ukrainian agriculture and positioning itself as an indispensable supplier for Africa and the Middle East, Russia has used wheat (a vital food resource) as a strategic lever within the Ukraine conflict. To achieve this, the Kremlin has employed various manoeuvres that fall along the instrumentalization–weaponization continuum. **This strategy proves more effective as it exploits the structural agri-food vulnerabilities of importing countries, particularly those linked to climate change (rising temperatures, extreme weather events), which weaken local production capacities and increase dependence on global trade.**

The combination of war and climate disruptions thus contributes to reinforcing global food imbalances, making food security not only an economic issue but also a tool of political and diplomatic leverage. It therefore seems all the more important to study Russia's strategy of using wheat as a strategic lever considering the potential benefits the country could derive from climate change (cf. Part III – Prospective Scenarios and Recommendations). Indeed, some studies project that Russia could become one of the few countries to benefit from an expansion of its arable land and increased yields in certain regions, strengthening its position in global cereal markets.

[43] In July 2023, Vladimir Putin declared: "Instead of helping the countries that truly need it, the West has used the grain deal for political blackmail and turned it into a tool for enriching multinational corporations and speculators on the global market." He demanded that his conditions be met before Russia would rejoin the grain agreement (Agence France Presse, 2023).
[44] The conditions are economic, financial, and agricultural in nature: reconnection to the SWIFT banking system, resumption of ammonia exports, reopening of European markets, etc.
[45] In the summer of 2023, there were accusatory statements from Emmanuel Macron, President of the French Republic (Le Parisien with AFP, 2023), Nathalie Broadhurst, French Deputy Permanent Representative to the UN Security Council (Permanent Representation of France to the United Nations in Rome, 2023), and Josep Borrell, EU High Representative for Foreign Affairs and Security Policy (EEAS, 2023).

Figure 7 – The Weaponisation and Instrumentalisation of Wheat in the Russo-Ukrainian War



PART 2

CONFLICTS' ENVIRONMENTAL CONSEQUENCES: FEEDBACK EFFECTS AND STRATEGIC IMPLICATIONS

For a holistic understanding of the climate–conflict nexus, it is important to integrate into our analysis the environmental consequences of conflicts. These consequences, also instrumentalized, indeed generate feedback that reinforce preexisting vulnerabilities, thus fuelling a vicious cycle of insecurity. This approach allows the practical application of the concept of **double materiality**[46], employed here to understand how armed conflicts and vulnerabilities associated with climate change interact within a feedback loop. Analysing the climate–conflict nexus through the lens of double materiality also demonstrates the need to expand security frameworks that focus primarily on traditional threats (open warfare, nuclear, terrorism, etc.) to also include those associated with the degradation of the natural environment and the vulnerabilities faced by populations dependent on ecosystem services.

This section therefore pursues a dual objective: analytical, through the examination of the environmental consequences of conflicts and the feedback mechanisms they generate; and prescriptive, by highlighting the current limitations of French strategic thinking and proposing concrete avenues for improvement.

A. Environmental Consequences and Feedback Effects

The environmental consequences of conflicts fully fall within the *instrumentalization–weaponization continuum* of environmental vulnerabilities. While some environmental damage can be considered involuntary or collateral, other cases involve intentional pollution or degradation and constitute a form of weaponization, where the destruction of the environment becomes a strategic and tactical objective in itself (Baskoro, 2025)[47]. Given the strategic importance and catastrophic environmental consequences associated with the destruction of energy infrastructure, such targeting appears to pursue a dual purpose: neutralizing adversary energy systems while causing degradation and pollution in certain environments. The destruction of dams, refineries, or power plants—particularly nuclear facilities, which releases numerous hazardous contaminants and chemicals such as asbestos, white phosphorus, or persistent pollutants[48]—clearly illustrates this phenomenon. The destruction of the Kakhovka dam on the Dnieper River in Ukraine in June 2023 by Russia, for example, caused substantial damage: the floods facilitated the spread of copper, arsenic, and petroleum, the

[46] The concept of double materiality was introduced in 2024 by a European directive, the Directive on Corporate Sustainability Reporting, to highlight how companies and climate change interact and reinforce each other. The objective of this concept was notably to ensure that companies report both on their impact on the environment and on the impact of climate change on their activities. This concept can also be applied in other analytical frameworks to shed light on how two dimensions of the same phenomenon interact and converge. In this note, we will use this concept to illustrate how conflicts and climate change mutually feed and reinforce each other through a feedback loop.

[47] Targeting the environment is not new, but it is today intensified by two factors: 1) climate change, which worsens the situation, and 2) the availability of more data, allowing for better traceability. As a result, this phenomenon is now more prominently highlighted.

[48] Known as PFAS, these persistent chemical compounds are highly toxic because they accumulate in the environment and the human body without breaking down, disrupting the hormonal system, weakening the immune system, and increasing the risks of cancer and developmental disorders.

displacement of mines and unexploded ordnance, and severely damaged soils as well as groundwater and surface water (Duffau et al., 2024).

Yet several international legal frameworks have been developed to protect the environment during wartime through international humanitarian law (IHL). The First Additional Protocol to the 1977 Geneva Conventions on International Humanitarian Law recognizes the legal obligation to "protect the natural environment against widespread, long-term and severe damage" caused during armed conflicts (Rekrut, 2025). It therefore legally condemns environmental degradation as a consequence of conflict, as well as any method of warfare that would entail such harm to the environment. IHL also acknowledges the link between the environmental consequences of conflicts and climate change (Ali et al., 2025; ICRC, 2020). The 1978 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD) specifically targets the use of techniques designed to alter the environment (climate, earthquakes, floods, etc.) to achieve military objectives—thus the use of the environment itself as a weapon (ICRC, 2003). Moreover, when targeting energy infrastructure or an "installation containing dangerous forces"—a term used to designate dams and power plants in particular (ICRC, 2025)—the risks of pollution-related incidents must be taken into account during attack planning, especially in the proportionality assessment and the evaluation of precautionary measures. Such an attack is therefore not prohibited under IHL, but its consequences may be legally sanctionable if they violate the provisions specifically aimed at protecting the environment in the conduct of hostilities.

However, IHL faces certain limitations, both theoretical and in its practical application. First, the protection of the environment under humanitarian law is limited to an anthropocentric conception: it is protected only if its destruction compromises "the health or survival of the population" (ICRC, 2020; El-Khoury, 2011). Such a conception restricts the scope of environmental protection by neglecting ecosystem functions that, even without an immediate impact on human survival, contribute to overall climatic and biological stability. This partial approach therefore prevents the adoption of a holistic vision of environmental protection in the context of conflict. **Furthermore, the legal provisions established by international humanitarian law are not systematically applied by conflict actors**, who invoke military, operational, and tactical priorities (Valk, 2019). Violations of these legal provisions thus have numerous direct and indirect environmental consequences.

1. Conflicts' Environmental Consequences

This section provides an overview of the environmental consequences of conflicts. This classification is not intended to be exhaustive, especially since impacts vary greatly depending on the conflict—its nature, geographic location, level of intensity, actors involved, and modes of action—and will focus primarily on the consequences during and after the conflict, without tracing upstream along the supply

chain[49]. To carry out this exercise, we will focus on high-intensity conflicts due to their current relevance and the particularly polluting nature of the equipment deployed (for example, the fuel consumed by fighter jets or the toxic agents contained in munitions). The resulting environmental impacts can be classified into two main categories: direct consequences and indirect consequences (Krampe et al., 2025).

In order to identify and assess the most destructive damage, it is essential to have reliable data on the environmental consequences of conflicts. However, such data remain particularly difficult to obtain. **On the one hand, they fall within the military domain, which has traditionally been characterized by great opacity** in the publication of environmental data. It is in this context that the "military emission gap" initiative was launched, aiming to address the lack of available data on greenhouse gas emissions generated by military activities. An estimate by the Conflict and Environment Observatory (CEOBS) from 2019, however, suggests that global armed forces and their supply chains account for approximately 5.5% of global greenhouse gas emissions (2022). If these emissions were considered at the level of a single state, the global armed forces would rank as the fourth-largest emitter worldwide, after China, the United States, and India. **On the other hand, access to data specifically related to conflicts remains particularly complex** due to logistical and technical constraints, which make information collection difficult in conflict zones, while methodological limitations persist due to the lack of standardized protocols for measuring and analysing emissions. Consequently, environmental impact studies are often conducted long after the end of the conflict (Nixon, 2011).

Direct consequences: weaponization and collateral damages

We propose a classification of the direct environmental consequences of conflicts around four themes: soils, forests and biodiversity, water, and air/atmosphere, although many impacts are common and cross-cutting across these different environmental components. This classification is based on the study by Meaza et al. (2025), which reviews 193 case studies conducted in various countries between 1914 and 2023, and shows that the most well-documented environmental impacts concern deforestation, soil erosion, and biodiversity loss. Other significant impacts include those affecting water and air quality, as well as effects on high-altitude areas, which are attracting growing interest.

Conflicts have direct consequences on soils, notably linked to explosive debris, and especially unexploded ordnance. These generate persistent pollution and significant pyrotechnic risks, with dramatic consequences for civilian populations (Berhe, 2007). The case of Ukraine illustrates this issue well: in 2014, the country was considered the most heavily mined in the world (BRGM, 2023), which affected certain cereal crops. This soil pollution is all the more concerning as it persists over time. In France, the environmental legacy of the First and Second World Wars is still perceptible, with nearly 500 tons of munitions from these conflicts still discovered each year by the Civil Security Demining

[49] The upstream supply chain of a conflict refers to all the resources, infrastructure, actors, and logistical flows mobilized to prepare, support, and sustain operational capabilities before and during hostilities.

Service (Hilaire, 2024). Other risks have also been identified, such as chemical contamination of soils by pollutants like petroleum, heavy metals, or herbicides[50] (Certini et al., 2013). These pollutions not only affect soils but also other ecosystems, such as forests or aquatic environments (Tran et al., 2025).

Conflicts also produce deleterious effects on forests, particularly through deforestation practices. This deforestation is explained both by the financial and food resources it provides and by the tactical advantages it offers to actors involved—whether voluntarily or not—in the conflict (Aas Rustad, 2008). Belligerents may exploit forests for their market value and the revenues they generate (such as timber trade), but also as a source of fuel or food, thereby exerting significant pressure on these ecosystems. In addition, forests can be used as tactical terrain, and their destruction or intentional clearing is sometimes employed to deprive the enemy of cover, as illustrated by the use of Agent Orange by the United States during the Vietnam War to defoliate the jungle where Viet Cong forces were located (Chemillier-Gendreau et al., 2006). Forests may also be destroyed for operational purposes, for example to establish a military base.[51]

Water is among the resources most affected by conflicts, whether it is deliberately contaminated, targeted during attacks (weaponization of water), or impacted inadvertently. The Israeli–Palestinian conflict illustrates the resulting pollution: weakened sanitation infrastructure prevents the treatment of wastewater, untreated wastewater is discharged into the sea, and groundwater becomes contaminated and subsequently undrinkable (Greenpeace, 2024). Like soils and forests, freshwater and marine environments are particularly exposed to contamination by toxic residues and heavy metals, which can infiltrate surface or groundwater and pose serious health risks to populations and ecosystems (Kotsis, 2025). More recently, a portion of the literature on war–water interactions has focused on water pollution caused by the Russo-Ukrainian conflict, highlighting the damage resulting from the destruction of water infrastructure (Semenenko et al., 2022; Yutilova et al., 2025; Strokal et al., 2025).

The degradation of these different environments (soils, forests, water) also has major repercussions for endemic biodiversity (Belis et al., 2025). These damages manifest directly through species loss, habitat destruction, the introduction of exotic species into certain ecosystems, or the overexploitation of natural resources. Conflicts also weaken conservation institutions and policies, thereby compromising efforts to protect habitats and species (Sousa et al., 2022). For example, the destruction of the Kakhovka dam caused massive animal mortality (fish, invertebrates, molluscs, crustaceans), while the lowering of water levels and flooding of land drastically altered the natural habitats of aquatic and terrestrial species, jeopardizing their survival (Kasyanchuk et al., 2024).

Finally, the last theme concerns the impact of conflicts on air pollution. In connection with the growing awareness of the role of greenhouse gas emissions in climate change, collection and analysis

[50] The use of herbicides by armed forces serves several tactical objectives: eliminating vegetation that provides cover for the enemy, compromising their crops and resources, and facilitating the control of strategic areas.
[51] In this case, the environment around the base is no longer protected under international humanitarian law, even though considerations of proportionality and precaution must still be taken into account.

methods—whether methodological approaches or the tools used—have improved considerably, in part thanks to the support of non-governmental organizations and actors specializing in carbon measurement and monitoring. Increasingly, the concept of the "carbon footprint" of war is discussed, referring to how conflicts contribute to the increase in greenhouse gas concentrations in the atmosphere. **The initiative on greenhouse gas accounting during wartime** has specifically estimated the impact of Russia's invasion of Ukraine on the climate (Klerk et al., 2025). The study assesses the carbon footprint of the conflict since 2022 and identifies the main sources of emissions as military activities and the destruction of civilian infrastructure, responsible for 34% and 27% of total conflict emissions, respectively. Fires caused by the conflict also constitute a significant source of pollution, releasing substantial quantities of toxic gases and fine particulate matter. This report estimates the conflict's emissions at 237 million tons of CO_2 equivalent over the period, equivalent to the combined annual emissions of Austria, Hungary, the Czech Republic, and Slovakia.

Other spaces, ecosystems, and resources are also affected by conflicts, notably high-altitude areas. A CEOBS report (2025) highlights the impacts of ballistic missiles on the mesosphere and stratosphere. The fuels and materials of these missiles can alter the chemistry, temperature, and atmospheric circulation of these layers (CEOBS, 2025). These impacts are all the more concerning because the released compounds are difficult to remove, and the extent of pollution depends on the nature of the fuels as well as the altitude at which they are released.

The Consequences of Environmental Degradation: A Lasting Impact on Countries' Environmental Performance

The environmental consequences of conflicts, often visible over the long term, are reflected in a correlation between the duration of peace and the Environmental Performance Index (EPI) (Krampe et al., 2025). Indeed, the longer a country has experienced war, the lower its environmental performance tends to be, compared with countries that have been at peace for a longer period. On average, in countries that have returned to peace over the past twenty years, the EPI is approximately 15% lower than in countries enjoying a longer-lasting peace (Krampe et al., 2025). Several factors can account for this correlation, both at the state level and locally.

First, in the context of the return of high-intensity war to the European continent, government priorities are primarily oriented toward short-term horizons, marginalizing long-term strategic planning on environmental issues, including climate-related ones (Le Monde, 2025). Political priorities and resources, particularly financial ones, are thus often redirected toward security matters considered more urgent. This is reflected in financial flows, where budgetary allocations follow a war economy logic, and also in terms of opportunity costs, to the detriment of environmental policies (Gayle, 2025). This is currently observable as the significant increase in defence budgets of many states—the world's military expenditures in 2024 experienced their largest growth since the end of the Cold War, rising by 9.4% compared with 2023 (SIPRI, 2025)—already calling into question certain investments related to environmental issues (Tagliapietra, 2025).

War economies and the associated military investments also entail an environmental cost, notably an increase in the carbon footprint, over the medium and long term. The increase in military budgets automatically leads to higher emissions associated with the defence sector due to the expansion of production for certain equipment and technologies, which are energy-intensive both in manufacturing and use. One study specifically revealed that the increase in investments in the European defence sector could directly compromise the climate targets established under the Paris Agreement: the "ReArm Europe[52]" plan is expected to generate an additional 150.3 million tons of CO_2 equivalent. These investments, which do not systematically account for environmental criteria and are only relatively subject to environmental regulations, risk locking Europe into decades of high-carbon infrastructure and equipment (Greenly, 2025), potentially poorly adapted to extreme temperature events such as heatwaves. Moreover, a major part of the carbon footprint of conflicts comes from reconstruction activities of damaged or destroyed infrastructure[53]. This is the case for the war conducted by Israel in Gaza, where emissions related to destruction, debris removal, and reconstruction are estimated at 31 million tons of CO_2 equivalent (Lakhani, 2025).

Some states experiencing war lack the political stability necessary to implement environmental policies. The absence, weakness, or instability of governance structures also complicates states' ability to establish and enforce such policies and can lead individuals to adopt consumption and natural resource exploitation practices that are inappropriate and harmful to the environment (Unruh et al., 2013). For example, scientists and researchers face difficulties accessing certain areas, compromising conservation programs (CEOBS, 2025). Moreover, national parks and protected areas may lose the protection they previously enjoyed or become more difficult to preserve in the face of poaching.

At the local level, certain social dynamics or behavioural changes during wartime among populations can also have destructive effects on the environment. Population displacement, for example, can have a substantial environmental footprint, particularly when it is unplanned (ICRC, 2020). Refugee camps can have significant impacts on the areas in which they are established: residents, forced to meet their basic needs, often rely on local resources (such as wood), thereby exerting increased pressure on surrounding ecosystems (CEOBS, 2025), especially since displaced persons' camps are often located within protected natural areas (Hsiao, 2023).

Although it remains complex to precisely quantify the environmental consequences of conflicts, existing research clearly demonstrates that their effects—both direct and indirect—lead to profound and lasting degradation of ecosystems. However, environmental impacts are not limited to immediate

[52] "ReArm Europe," renamed "Readiness 2030," is a European initiative aimed at strengthening the continent's defense capabilities, supporting Ukraine, and consolidating Europe's security and defense. This plan envisions mobilizing up to €800 billion over four years.

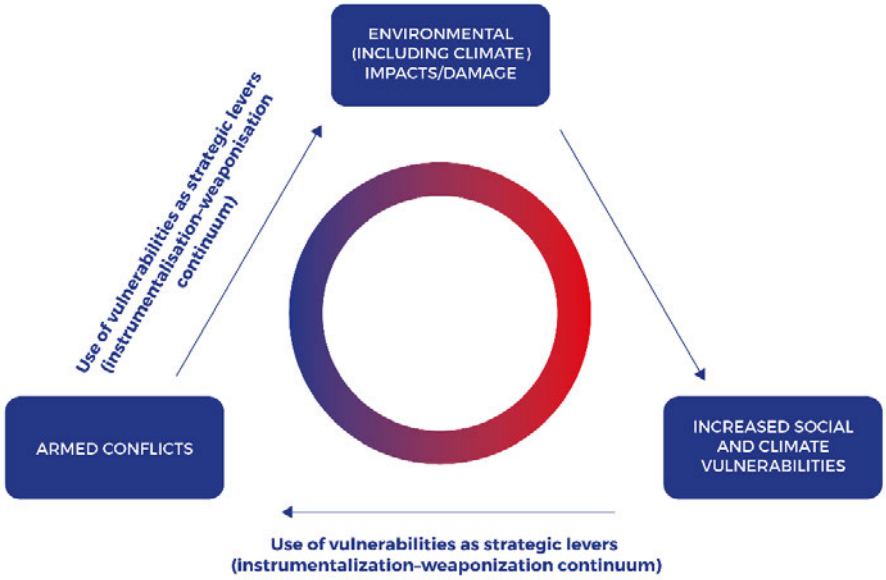
[53] The authors of the study developed their own methodology by adapting the publication and accounting principles of the GHG Protocol. To carry out carbon reporting, the GHG Protocol (Greenhouse Gas Protocol) established a methodology based on scopes 1, 2, and 3, providing a common framework for accounting greenhouse gas emissions of organizations (GHG Protocol, 2004). The study in question relies on this approach, which it then expanded and adapted to apply to the specific context of wartime situations.

destruction: the dynamics and feedbacks generated by conflicts also constitute a major source of vulnerability for the resilience of affected territories and populations.

2. The Cascading Effects of the Environmental Consequences of Conflicts: A Feedback Loop Between Conflict Dynamics, Climate Change, and Environmental Degradation

Environmental degradation caused by conflicts is essential to consider, as it reinforces the environmental and climate vulnerabilities of populations. When overlaid with the effects of climate change, these degradations can in turn be exploited as strategic levers along the *instrumentalization–weaponization continuum*, thereby contributing to the perpetuation of preexisting conflict dynamics (Buhaug & von Uexkull, 2021).

Figure 8 – "Conflict, Climate, and Environment" Feedback Loop



This figure illustrates the complex interactions between conflict dynamics, climate change, and environmental degradation.
(1) First, the emergence of conflict dynamics is observed, including armed conflicts, though not limited to them. (2) These different forms of conflict exert significant pressures on the environment: they directly and indirectly degrade ecosystems, intensify climate change, and the resulting vulnerabilities can sometimes be exploited as strategic levers. (3) Conflicts thus increase the vulnerability of affected populations while weakening their capacity for resilience. (4) This heightened vulnerability can in turn be exploited as a strategic lever in new conflicts, feeding a vicious cycle of destabilization and environmental degradation.

The figure therefore illustrates how interactions between conflict dynamics, the environment, and climate vulnerabilities operate within a circular dynamic, with each dimension influencing and reinforcing the others. This underscores the necessity of a systemic and holistic approach to understand these challenges.

The cases of Sudan and Haiti help illustrate this feedback loop. Often cited as examples in the dominant narrative suggesting that climate change causes conflicts (Bronkhorst, 2012; Mosello et al., 2023), we draw on these examples specifically to show that this understanding is mistaken or overly simplified. In reality, the links between insecurities, conflicts, and environmental conditions are far more complex: environmental, social, political, and security dynamics mutually reinforce one another.

Sudan: Feedback Loops Between Military Factions, Climate Vulnerabilities, and Environmental Degradation

Sudan is experiencing a major political and military crisis. In 2021, two factions—the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF)—allied to overthrow the Al-Bashir regime. However, tensions erupted over the establishment of the new government (Amnesty International, 2023), evolving into a civil war from 2023 onward. This conflict constitutes a severe humanitarian catastrophe, causing the deaths of 150,000 people and the displacement of 13 million individuals since April 2023 (Brachet, 2025).

Beyond its political instability, Sudan is also highly exposed to climate change and very vulnerable to its impacts. The country is regularly hit by droughts and heatwaves (with summer temperatures often approaching 50°C), floods, as well as increasing desertification and soil erosion (Le Monde, 2024). Water is a central issue in this context—closely linked to food insecurity—as the country suffers from chronic famine, exacerbated by climatic hazards and land degradation.

In this civil war, the environment and climate vulnerabilities are deliberately exploited by the warring parties. The Nile River, an essential resource for Sudanese people—particularly for drinking water, agriculture, and fishing—is weaponized: bombings and airstrikes destroy water infrastructure, depriving entire districts of potable water (Ahmed, 2025). The consequences of these attacks are particularly severe for local populations, especially as they compound preexisting infrastructural, environmental, and climatic vulnerabilities (Geneva Academy, 2025). The RSF, in particular, has targeted dams, water treatment plants, and urban distribution systems as part of their military strategy (OHCHR, 2025). Notable damaged infrastructure includes the Jebel Aulia Dam upstream of Khartoum, attacked in November 2023 due to its proximity to the front line, and the Merowe Dam in the Northern State (CEOBS, 2025). **Military factions also exploit agro-food vulnerabilities as a strategic lever by blocking access to humanitarian aid** (The Guardian, 2024). They have deliberately exacerbated famine by targeting humanitarian workers and local volunteers and hindering relief operations. In this sense, famine is often described as a "weapon of war" (Dudouet, 2025; OHCHR, 2025).

These attacks have had major consequences not only for water supply but also for agriculture, fishing, transportation, and hydropower production. As fighting spread from Khartoum to agricultural regions, the irrigation system was damaged and collapsed. Sudan's agricultural production in 2023–2024 decreased by 46% compared with the previous year (FAO, 2024), a decline attributed primarily to the conflict's impact on agricultural activities. Security threats forced farmers and fishers to flee

their lands, particularly in central Sudan, previously the country's agricultural heartland (Ahmed, 2025). The conflict has also caused other environmental effects, notably accelerating deforestation.

The case of Sudan thus illustrates the feedback loop phenomenon. Environmental degradation and the weaponization of climate vulnerabilities by military factions have severely undermined Sudanese society's resilience. Populations have lost their sources of income and access to food production, effectively destroying their livelihoods (Al Sharfi, 2024). This situation has generated intense social tensions, manifested in land disputes, intercommunal clashes, and massive displacement. The population is thus "caught in a vicious circle that only exacerbates tensions" (CICR, 2022).

Haiti: A Vicious Cycle Between Climate Vulnerabilities and Gang Violence

The case of Sudan highlights the role of feedback mechanisms in high-intensity conflicts. However, **these dynamics also manifest in other forms of conflict**, as illustrated by the situation in Haiti.

Since the assassination of President Jovenel Moïse in July 2021, the Haitian capital, Port-au-Prince, and its surrounding areas have faced a surge in high-intensity clashes between gangs (ICG, 2021; Abi-Habib & Paultre, 2022), threatening the security of residents and the country's development. In addition, Haiti is marked by chronic political instability, which obstructs the implementation of complex and costly climate change adaptation policies. **Haiti is also one of the countries most vulnerable to the intensification of extreme climate events**—hurricanes, tropical storms, floods, landslides, droughts—and to rising sea levels caused by climate change (World Bank, 2025). These phenomena, due to the scale of the damage they cause, severely compromise food security, hinder economic development, and exacerbate preexisting climate vulnerabilities (SIPRI, 2025).

In Haiti, approximately 66% of the rural population relies directly on agriculture for their livelihoods (USAID, 2020), even as the country remains heavily dependent on food imports, which account for nearly half of national consumption (SIPRI, 2025). This structural dependency makes the economy and food security particularly vulnerable to internal disruptions. In the current crisis, gangs **instrumentalize** this fragility by seizing agricultural lands, destroying essential infrastructure such as irrigation systems, and imposing illegal taxes on farmers attempting to continue their activities (FEWS NET, 2024; ACAPS, 2025). These practices paralyze local production, exacerbate the economic precarity of rural households, and compromise their capacity to withstand future climate shocks. The presence of armed groups has also triggered significant internal displacement: nearly one million people had fled conflict zones by February 2025 (UN Humanitarian Coordinator, 2025). These population movements increase pressure on natural resources in host areas and contribute to the destabilization of local agricultural and food systems. In this way, **gang violence further deepens the food crisis by destroying or blocking the food system in a country already heavily reliant on imports and experiencing structural climate degradation**.

Gang presence also hinders the implementation of effective responses following natural disasters, further compromising the resilience of communities affected by extreme climate events. Political and social instability limits state-led crisis management, which instead relies heavily on international

humanitarian aid (Karlsson, 2024). However, humanitarian interventions can themselves have notable environmental impacts. For instance, 2 to 3 million wooden poles were harvested from already weakened forests to support temporary shelters, representing 40 to 60 km² of deforested plantations (Navaratne, 2010). Deforestation is a factor that increases the frequency and intensity of extreme climate hazards such as storms and droughts (SIPRI, 2025). Additionally, humanitarian aid is often diverted by gangs, preventing the building of local resilience to climate events and further intensifying preexisting climate vulnerabilities (Buschschlüter, 2023).

These examples illustrate **how the conflict situation in Haiti, through the action and persistent presence of gangs, contributes to political and social instability that reinforces the country's and local populations' climate vulnerabilities,** which existed prior to the conflict. Moreover, these dynamics hinder the rehabilitation of the country's economic and social infrastructure, which could support the implementation of adaptation strategies and the development of local resilience to reduce climate vulnerability. **The worsening of climate vulnerability and environmental degradation thus reinforces tensions and conflict dynamics, creating a vicious cycle in which these factors perpetuate environmental and social fragility**.

B. Strategic Implications for France and French Armed Forces

This brief analyses the use of climate vulnerabilities as a strategic lever in conflicts, and the feedback mechanisms that enhance the capacity to instrumentalize and weaponize these vulnerabilities. Conflicts generate considerable environmental damage, which reinforces preexisting vulnerabilities and provides additional levers for belligerents. **Although the security implications of these dynamics are substantial, there is currently a noticeable gap—or even a lack of consideration—of them within French strategic thinking.**

Accordingly**, this section emphasizes the necessity for the Ministry of the Armed Forces to deepen its understanding of the interactions between climate change and security by incorporating additional dimensions into its strategies**. It proposes two avenues of reflection aimed at broadening the concept of climate security as currently envisaged by the Ministry of the Armed Forces: first, through the strategic integration of ecological security[54]; and second, by considering the instrumentalization of climate vulnerabilities within the framework of hybrid warfare practices.

1. Strategic Integration of Ecological Security to Enhance Consideration of Emerging Insecurity Factors

For a systemic integration of environmental and climate issues into security policies, it is first necessary to shift the perception of the referent object—that is, what should be prioritized for protection (McDonald, 2021)—as well as the types of threats against which this object should be

[54] See definition in the glossary

safeguarded. Climate security, as currently conceived, focuses on protecting the international system, the nation-state, and human societies (Estève, 2021), relegating ecosystems to a secondary role. In contrast, ecological security places ecosystem resilience at the centre of security considerations**, recognizing that environmental and climate stability constitutes a sine qua non for any form of human, national, or international security.**

This approach thus calls for a rethinking of three fundamental dimensions: who or what should be protected, which actors are legitimate to provide that protection, and which institutional frameworks need to be adapted to achieve it (McDonald, 2021). By refocusing on ecosystems, ecological security highlights the close links between the state of natural environments and the capacity of defence apparatuses, institutions, and societies to anticipate and respond to conflicts. This approach broadens the understanding of insecurity factors: it no longer limits itself to human or climate vulnerabilities but also incorporates the damage inflicted on ecosystems, drawing on the concept of planetary boundaries as an indicator of ecological thresholds that must not be crossed (Lazard and Young, 2021).

The concept of ecological security allows us to overcome current shortcomings in addressing the climate–conflict nexus. Dominant approaches still primarily focus on the impacts of climate change on insecurity, framing these changes as "risk multipliers" or "threats." However, this report has demonstrated the need to also analyse how climate vulnerabilities are strategically leveraged in contexts of insecurity, as well as how insecurity exacerbates ecological disruptions and climate instability—a field that remains largely underexplored (Lazard and Young, 2021). Furthermore, our case studies illustrate the relevance of the ecological security concept, which enables the integration of other essential dynamics into the analysis, such as disruptions to the hydrological cycle, soil fertility loss, and biodiversity erosion.

For the Ministry of Armed Forces, integrating ecological security would help strengthen national defence and security strategy in response to the evolving strategic environment. This environment is characterized not only by intensifying conflict and a reshaping of power relations, but also by ecological disruptions without historical precedent. Whether it concerns climate change, the sixth mass extinction, or the transgression of other planetary boundaries, these transformations are redefining conflict dynamics and call for adaptation across the six strategic functions[55]. The goal is not to make the environment the Ministry's primary concern, but rather to **enrich existing strategies by incorporating new security factors**: environmental degradation linked to conflicts, the strategic exploitation of climate and environmental vulnerabilities, and the feedback loops between them. Such an evolution is essential to ensure the resilience of the defence apparatus and, more broadly, to rethink the interactions between climate change, environmental dynamics, and contemporary warfare practices, particularly hybrid warfare.

[55] See the French *Revue nationale stratégique* 2025.

2. Strategic Integration of the Instrumentalization of Climate Vulnerabilities as Hybrid Warfare Practices

We are currently experiencing a phase in which climate issues are becoming increasingly politicized, accompanied by a questioning of the importance assigned to combating climate change by both security actors and civilians (Sikorsky, 2025; Alexandre, 2025). However, climate security—whether approached from the perspective of human security, international security, or other frameworks—and ecological security underscore the importance of continuing to **treat climate change as a strategic issue, particularly given its interconnection with hybrid warfare practices.**

This note has shown, through several case studies, how climate vulnerabilities and conflict-related environmental degradations can be leveraged strategically within conflict dynamics. **The diversity of ways in which climate vulnerabilities are instrumentalized can thus be understood through the concept of hybrid warfare practices**, as defined in the introduction. The definition used by the EU explicitly refers to the strategic exploitation of an adversary's vulnerabilities (Joint Research Centre of the European Commission, 2020). As the deleterious effects of climate change accelerate under anthropogenic pressure, it appears that, in the absence of sufficient adaptation measures, states and their populations become increasingly exposed, heightening the likelihood that these vulnerabilities will be exploited against them and expanding the spectrum of conflicts beyond traditional high-intensity warfare (Braw, 2019). Weaponization is not the only way climate vulnerabilities are used strategically; increasingly, this occurs through non-strictly military processes, involving intertwined discursive, normative, informational, and coercive manoeuvres that closely resemble hybrid warfare practices.

However, this aspect remains a blind spot in strategic thinking, both in terms of integrating climate issues into the analysis of hybrid practices and, conversely, of considering hybrid practices in climate studies. Some institutions have begun to address the intersection of these two fields, either implicitly or explicitly, but such efforts remain rare (Briggs, 2020). A few research centres now conduct analyses, and regional organizations increasingly recognize the importance of articulating climate and security issues within their frameworks, which themselves are being redefined in light of the new hybrid threat paradigm[56]. Nevertheless, the integration of this relationship has not yet been reflected in national military strategies, or exists only at a marginal level[57]. In French strategic documents, the two fields are acknowledged, but their intersection has not yet been fully operationalized. This reflects a gap in French strategic thinking, which struggles to adopt a holistic approach to the security challenges associated with climate change.

Considering the intersection between hybrid warfare practices and climate change would enhance the anticipation and resilience capabilities of the French Ministry of Armed Forces in the face of

[56] For example, NATO with its Climate Change and Security Centre of Excellence (CCASCOE).
[57] Romania treats the effects of climate change and hybrid threats as belonging to the same category of "emerging threats" and implicitly links them through the lens of social security environment in its 2020–2024 National Defense Strategy (Presidential Administration, 2020, Introduction, paragraph 9).

advances by other major military powers. Indeed, the adoption of the hybrid warfare concept in Western military strategies came after its integration in Russia and China[58]. Formal definitions of hybrid warfare in the United States largely reflect strategies developed by Russia and China (Briggs, 2020). More specifically, Russia has long employed the concept of *maskirovka* in its operations and strategy, which involves concealing identity and objectives while using third-party actors whenever possible, without admitting responsibility even when actions are state-linked (McDermott, 2016). Similarly, with some nuances, China has developed the concept of *unrestricted warfare* (Patalano, 2018).

Finally, this consideration would enable the French defence apparatus to develop strategic climate resilience, understood as the capacity to anticipate the exploitation of its climate vulnerabilities by third-party actors. This requires generalizing foresight models that anticipate geopolitical risks and their various forms of manifestation, including in confrontations of different nature and intensity. It also involves taking into account the informational domain, where climate disinformation represents an additional example of the instrumentalization of climate vulnerabilities within hybrid warfare practices (Ellison & Hugh, 2024).

[58] The US Naval War College, the U.S. Navy's higher education and research institution, held a symposium on the subject in September 2022.

PART 3

FORESIGHT SCENARIOS AND RECOMMENDATIONS

A. Foresight Scenarios

1. Scenario 1 : 2038 – Russo-Ivorian Agreement: Wheat for a Military Base

In 2038, a major drought causes a collapse in European cereal yields and triggers a surge in global food prices, exacerbating political instability in Africa. Taking advantage of this crisis, Moscow signs an agreement with Côte d'Ivoire guaranteeing wheat deliveries in exchange for the establishment of a military base near Abidjan, using local food vulnerabilities as a strategic lever for influence and military projection. This manoeuvre significantly reduces French and European influence in West Africa, forcing Paris to reposition both strategically and doctrinally to counter Russia's growing presence.

By 2038, scientists record an increase of 1.9°C in global average temperatures and 3.1°C in European average temperatures compared to pre-industrial levels (IPCC SSP-4.5**). European agricultural plains—particularly in France, Romania, southern Ukraine, and Russia—suffer structural aridification**, with reduced rainfall and prolonged droughts. Chernozem soils erode, exacerbated by soil contamination from the war with Russia, causing cereal yields (wheat, maize, sunflower) to drop by 40% compared to the 2020s. Spring 2038 brings historic droughts to the Black Sea region and the Dnieper basin, reducing regional wheat production by 50% relative to 2037. **Russia, having maintained its agricultural output** thanks to an expansion of arable lands in Siberia and the Arctic due to melting ice, nonetheless suffers from this extreme weather event. Major cereal exporters (Ukraine, France, Romania) limit exports to secure domestic supply. Russia announces a partial suspension of its cereal exports to Europe and global markets, while maintaining shipments to "strategic partner" countries. **Food prices double on international markets, particularly affecting North Africa and the Sahel**, where food insecurity has been rising since the 2020s: by 2038, 347 million people suffer from food insecurity. Factors driving this crisis include declining yields from desertification and climate shocks, increased import dependence, rising food prices, mounting conflicts, and underinvestment in adaptation. In June, food riots erupt in Tunisia, Mauritania, Benin, Senegal, Mali, and finally Niger, where the already fragile regime is overthrown.

In July 2038, fearing similar destabilization, **Côte d'Ivoire announces an agreement with Russia to secure wheat, maize, and fertilizer supplies**. The agreement guarantees massive deliveries at preferential prices in exchange for the establishment of a permanent Russian base near Abidjan, presented as a "humanitarian and food security logistics base." In an official speech to the Duma, the Russian government frames this policy as an act of "sovereign solidarity," emphasizing that "Russia, unlike the West, does not abandon its allies in times of crisis." Since the ceasefire between Ukraine and Russia in the early 2030s, relations between Moscow and the EU remain tense, marked by distrust and concern over Russian expansionism, especially due to repeated treaty violations and incremental territorial encroachment in Ukraine. Russian anti-Western narratives, amplified by state media and influence networks in Africa and the Middle East, consolidate wheat diplomacy as a pillar of Russia's smart power strategy. **The African Union is divided**: some states (Mali, Chad, Sudan) welcome the "Russian solidarity initiative," while others (Senegal, Ghana) condemn the political instrumentalization of food vulnerabilities. The EU denounces the Russo-Ivorian agreement as an attempt to militarize food

aid and "indirectly control" a strategic coastal territory. **The EU announces an emergency European food plan**, but its deployment is hindered by internal stock crises and disagreements among member states on aid prioritization. **France is caught off guard and condemns the move as a "disguised influence base."** Paris proposes a joint EU-AU humanitarian corridor to counter Moscow's influence, but this initiative is perceived as belated and paternalistic by several African countries, reinforcing perceptions of a decline in French influence in the Gulf of Guinea. Militarily, Paris fears that the Russian base could become a hub for intelligence, influence, and cyber operations in an already unstable region.

The establishment of a Russian military base in Côte d'Ivoire, anchored to "wheat diplomacy," represents a major strategic and geopolitical shift in West Africa. Moscow transforms global food vulnerabilities into a geopolitical projection tool, consolidating its military and political presence in a region historically tied to France. **This move completes the erosion of French influence in West Africa** and marginalizes Paris in regional crisis management. Consequences for France include growing diplomatic isolation, loss of strategic footholds, and weakened security partnerships with Gulf of Guinea coastal states now under Russian influence. Moreover, a domino effect emerges: other weakened states, such as Burkina Faso and Mali, consider similar agreements, further polarizing regional alliances. The military junta that seized power in Niger announces that negotiations are already underway. Within this context, **the Russian base in Abidjan becomes a regional pivot for the Africa Corps, combining military, intelligence, and influence functions**. The paramilitary group is tasked with amplifying Russian narratives: a military presence justified by a "climate-humanitarian duty." It also allows Moscow to control humanitarian corridors and food flows connecting the Gulf of Guinea to Sahelian countries, providing direct leverage over regional dynamics.

Operationally, **the Russian base disrupts West African strategic balances and forces French armed forces to reposition**. Paris strengthens its assets in Gabon and redeploys forces toward the Gulf of Guinea and the Mediterranean to contain Moscow's rise and secure humanitarian and maritime routes. The Ivorian base, now an intelligence and hybrid influence hub, constrains French operational capacity and complicates regional monitoring. The French Ministry of Armed Forces announces the end of Operation CORYMBE, previously aimed at maritime security in the Gulf of Guinea. Efforts now focus on key positions in Gabon and Djibouti, centering on stabilisation, intelligence, and protection of logistical flows. **This Russian presence inaugurates a new era** marked by multiple aerial incidents, signal jamming, and information campaigns designed to weaken the image of French forces. Moscow's informational strategy underscores the need for Paris to rebuild strategic credibility through influence and local cooperation. The French armed forces enhance capabilities adapted to emergency relief operations. Doctrinally, the Ministry tasks the Joint Center for Concepts, Doctrines, and Experimentation (CICDE) with integrating the instrumentalization of climate vulnerabilities, particularly in agriculture, into military strategies and doctrines. The goal is to identify French zones of influence at risk, adversary leverage tools, and anticipate potential geopolitical realignments in areas of interest. Finally, this scenario sparks national debate on the **loss of French influence in Africa** and

institutional reflection on the need to strengthen strategic food autonomy in response to Russian wheat diplomacy.

2. Scenario 2 : 2043 – Sino-Kiribati Civil-Military Center in the South Pacific

In 2043, China signs a "climate security" agreement with Kiribati, establishing a civil-military centre on Kanton Island. While officially presented as a humanitarian initiative, the agreement represents a significant strategic advance for Beijing in the South Pacific. In response to this expansion, the United States, Australia, and France discreetly reinforce their surveillance capabilities and military presence in the region. In France, the redeployment of forces toward French Polynesia reignites tensions between continental France and its overseas territories. Meanwhile, China leverages the climate vulnerabilities of the island states to expand its regional influence and consolidate political legitimacy, turning environmental fragility into a strategic tool of hybrid power projection.

By 2043, the **global average temperature has risen by +2.3°C compared to the 1850–1900 baseline** (IPCC SSP3-7.0), contributing to significant sea level rise. Globally, sea levels have increased by approximately 15.6 cm, with amplified effects in the South Pacific, where some atolls experience an average rise of 20 cm. **Several atolls have already disappeared, forcing the displacement of populations across numerous archipelagos since the 2030s**. Kiribati, composed of 32 atolls, is particularly affected, with six atolls submerged and uninhabitable since the 2020s. Amid the increasing frequency of climate hazards—cyclones, tropical storms—and the widespread destruction they cause, **Pacific island states have received growing humanitarian and economic support from multiple regional powers, notably the People's Republic of China (PRC)**. The People's Liberation Army (PLA) regularly conducts Humanitarian Assistance and Disaster Relief (HADR) missions to support local relief and reconstruction operations. Simultaneously, Beijing has signed several agreements to support the construction of climate-resilient infrastructure and the deployment of dual-use technologies—such as solar-powered desalination plants and amphibious drones—to foster economic development across Pacific island states, as seen in Vanuatu in 2031 and Nauru in 2035.

On April 19, 2043, in Beijing, the People's Republic of China (PRC) celebrates the twentieth anniversary of its security agreement with the Solomon Islands, with the President of Kiribati in attendance. During his speech, the Chinese Foreign Minister announces the **signing of a new "climate security agreement" between China and Kiribati**. The agreement establishes a joint civilian-military centre on the uninhabited Kanton Island, with dual objectives: first, to conduct scientific research on infrastructure resilience against extreme climate events; and second, to carry out Humanitarian Assistance and Disaster Relief (HADR) missions across the South Pacific, supported by light military equipment and surveillance and communication installations. "This centre will allow us to respond more quickly and better protect our partner island states, as well as those who may request our assistance in the future," the Chinese minister declares.

The agreement also introduces an unprecedented migration component: Kiribati citizens will be allowed to permanently relocate to China in anticipation of the submersion of their territories. They will have access to employment in southern coastal areas and can obtain permanent residency after five years. When asked by the press, the Kiribati President states: “China is the only power offering us a sustainable solution. It does not see us as refugees, but as partners capable of contributing to its society.”

When news of the agreement reaches Paris and Washington, the reaction is one of complete surprise. Kanton Island, at the heart of the Kiribati archipelago, lies in close proximity to French Polynesia. It is also centrally located among U.S.-jurisdiction territories and south of the Marshall Islands and Hawaii, where significant U.S. military forces are stationed. A few days later, the **United States** convenes an extraordinary meeting with AUKUS members (Australia, United Kingdom, United States) and **France**, proposing an intensification of maritime and aerial surveillance missions. Cautious of escalating tensions, the countries decline to issue a joint public statement. However, they agree on discreetly reinforcing their monitoring capabilities in the region and enhancing maritime and space intelligence sharing. The United States announces an increase in its aerial and naval assets in the area, including a destroyer, an attack submarine, and augmented rotations of maritime patrol aircraft from Hawaii. **Australia** launches a AUD 1.2 billion investment plan into its HADR program for Pacific island states, aimed at financing dual-use logistical capacities (transport, relief operations, and light port infrastructure). Canberra also announces the reopening of bilateral negotiations with Tuvalu regarding the residency status of its citizens, increasingly settled in Australia under climate refugee status. The unanticipated arrivals and lack of adequate support had previously sparked social and political tensions, including months of protests between proponents and opponents of climate refugee resettlement.

Regionally, France positions itself as a stabilizing power, supporting allied coordination without engaging in a military escalation, while actively contributing to the enhancement of regional surveillance capabilities. In Paris, the joint Crisis Cell of the Armed Forces and the Ministry of Foreign Affairs acknowledges the need to reassess the French posture in the Pacific. The command of the French Armed Forces in French Polynesia (FAPF) and the command for the Asia-Pacific maritime zone are tasked with drafting a gradual capability reinforcement plan through 2047. This plan involves the progressive redeployment of assets from Réunion and New Caledonia to French Polynesia, including a coastal surveillance vessel (Floréal) and a multi-mission ship (B2M D’Entrecasteaux), as well as establishing an enhanced aerial presence composed of two modernized Falcon 200 Gardians and an ATL2 aircraft dedicated to long-range maritime reconnaissance. The FAPF will also receive new satellite surveillance and secure communication assets, along with a detachment of MALE Reaper-FR drones for ISR (Intelligence, Surveillance, Reconnaissance) missions across the Kiribati region. France additionally reinstates joint exercise cycles with Australia and New Zealand under the FRANZ Defence Dialogue (France–Australia–New Zealand), reinforcing multilateral operational readiness and regional cooperation.

News of the Sino-Kiribati agreement spreads rapidly across France's overseas territories in the Pacific. In Réunion and New Caledonia, local populations struggle to understand the redeployment of part of the national armed forces from their territories to French Polynesia, perceiving it as abandonment. Conversely, in Polynesia, some residents criticize the militarization of their territory, viewing China as a pragmatic partner capable of providing immediate humanitarian assistance and economic development. Overseas citizens also voice frustration over the lack of investment in environmental protection and the slow delivery of economic aid from mainland France. **Protests erupt, fuelled by Chinese social media campaigns accusing France of failing to protect island populations and denouncing Western hypocrisy regarding historical responsibility for climate disruption.** The demonstrations are suppressed by local police forces, while the French Minister for Overseas Territories addresses local media without successfully calming tensions. **At the regional level, France places the Sino-Kiribati agreement on the agenda of the South Pacific Defence Ministers' meeting in November 2043.** The French representative defends the nation's "historic" commitment to the region, but the I-Kiribati representative labels the French discourse as "hypocritical," while the President of Micronesia praises the Chinese initiative and encourages other island states to pursue "future-oriented" partnerships with any actor capable of responding to the climate emergency.

The signing of the Sino-Kiribati agreement significantly heightens geopolitical tensions in the South Pacific. Since 2043, the French armed forces have reinforced their regional capabilities, yet the limited capacity of bases in French Polynesia and New Caledonia prevents any substantial increase in their presence. The operationalization of a new climate cooperation initiative or agreement by the French Ministry of the Armed Forces with the overseas territories has been slow to materialize due to budget constraints, while internal tensions persist, exacerbated by the divide between mainland France and the overseas territories. Anti-French sentiment grows among island populations, who question France's ability to protect and support them against the impacts of climate change, including through military means. In contrast, China consolidates its influence in the South Pacific, expanding its military presence to a strategically unprecedented level for the region and enhancing its credibility with island states through programs combining humanitarian aid, research, and economic development. **Through its agreement with Kiribati, China demonstrates its ability to strategically leverage the climate vulnerabilities of island states as a tool of influence.**

3. Scenario 3 : 2044 – 2045: Hostage Situation Involving a French Scientific Vessel in the Arctic

In 2044, the Arctic has been transformed by climate change and the increase in military and economic activities. After a collision between a U.S. Army supply ship and a Russian LNG tanker, a group takes a French scientific vessel hostage and demands guarantees for the ecological security of the region. The crisis triggers influence operations and weakens NATO. Paris attempts to negotiate but ultimately launches an assault with logistical support from Norway to free the hostages, resulting in deaths and

worldwide outrage. Aware of the fragilities and the need to stabilize the region, France organizes an extraordinary summit dedicated to ecological security in the Arctic.

In 2044, the Arctic experiences a warming of approximately +5°C compared to the pre-industrial era, with significantly higher warming during winter. The Arctic Ocean is ice-free every summer, and these ice-free periods are lengthening year by year (IPCC SSP5-8.5). **Polar geoengineering projects launched in the previous decade were abandoned** due to a lack of agreement among Arctic states on deployment conditions. The decision not to deploy also aimed to avoid fuelling a military escalation in an already tense area, as geopolitical rivalries intensify alongside the Arctic's transformations. **The Bering Strait, separating Eurasia (Cape Dezhnev, in Eastern Siberia) from North America (Cape Prince of Wales, Alaska), has become a major maritime route, particularly for oil and gas trade. The region is also witnessing an increasingly significant military and scientific presence, not only from Arctic states but also from external actors, including France, which claims polar nation status.** NATO military exercises have intensified, notably in Finland near the Russian border. Moscow and Beijing are also reinforcing their own activities. Moreover, the notion of "Arctic exceptionalism"—the vision of the region as being preserved from international rivalries—has largely eroded.

On June 24, 2044, a U.S. Army supply ship collided with a methane tanker that had not activated its AIS[59] system, causing an explosion and an unprecedented oil spill in the Bering Strait region. Washington condemned the incident but accused Moscow of being responsible through the "ghost fleet," while Russia denied any involvement. The damage was considerable, the cleanup particularly complex, and the event sparked widespread outrage among Indigenous peoples and environmental advocates. For more than thirty years, these groups have been raising alarms about the effects of climate change on marine mammal migrations, the increased risk of maritime accidents, and the gradual degradation of Indigenous peoples' traditional ways of life, which rely heavily on fishing and hunting. **This accident occurred in a context where the growing presence of commercial, military, and scientific vessels, along with the construction of energy and logistical infrastructure in Alaska, Russia, Finland, and Norway, already placed significant pressures on a fragile environment. Indigenous peoples, who represented only about 5% of the regional population in 2044 compared to 10% twenty years earlier, were directly affected by these transformations**. Already facing the impacts of climate disruption, their territories and traditional practices—including hunting, fishing, and seasonal migrations—were increasingly threatened.

Less than a month later, on July 16, 2044, a group composed of three environmental activists and three Sami and Inuit representatives, financially and logistically supported by a discreet philanthropist, took hostage the French-flagged scientific vessel Tara Polar Station 2 in international waters, not far from Norwegian territorial waters. Onboard were scientists from several European countries (4 French, 1 German, 1 Swedish, and 1 Finnish). They demanded guarantees for the ecological security of the Arctic, calling for the unlimited expansion of zones classified as off-limits to

[59] AIS, or Automatic Identification System, is a global system for the automatic exchange of standardized messages between ships, using radio signal transceivers and GPS.

industrial and military activities, and the establishment of a special fund for ecosystem restoration. Speaking live on the Chinese social network TikTok, the group's spokesperson declared: *"There is so much appetite for our region, but they are destroying our nature, and by destroying it, they are killing us. Nature is the extension of our body and soul: we must protect it to survive. The scientists on this ship, we mean them no harm; we just want our lives to be taken seriously."* The live stream was viewed 400 million times, generating a wave of international solidarity on social media under the hashtag #SaveArcticPeoples. **A large-scale influence operation was then orchestrated** on social networks, with hundreds of thousands of messages accusing the United States of intentionally destroying the environment to annihilate Indigenous peoples in the region and to exploit previously protected areas for new industrial projects. **These narratives, amplified by Egypt, Russia, and China, sought to instrumentalize the climatic and environmental vulnerabilities of Indigenous populations to serve political and strategic interests.** For Cairo, the goal was to convince its economic partners to continue prioritizing the Suez route over Bering, given declining revenues over the past decade. For Moscow and Beijing, the objective was to tarnish the United States' image and position themselves as protectors of Indigenous peoples and the environment.

Paris immediately established an interministerial crisis cell, but France found itself in a delicate position: four French nationals were being held aboard the ship, the situation was broadcast live, and the French public—highly sensitive to environmental and Indigenous issues—rejected any use of force. The hostages' release therefore had to be conducted without armed intervention, as the hostage-takers were widely perceived by global public opinion as defenders of Indigenous rights and the environment. In this context, every move was closely scrutinized. **Relations within NATO became strained**: in Finland, Sweden, and Canada, voices were raised criticizing governments for failing to protect Indigenous peoples and the Arctic environment, fuelling public criticism of the United States and temporarily distancing Washington. Negotiations dragged on for more than three days. The hostage-takers demanded immediate measures not only from the United States but also from all members of the Arctic Council. **Paris attempted to play a mediating role but failed to secure significant concessions.** After four days of unsuccessful talks, a French Navy special operation was launched with logistical support from Norway. **The assault resulted in the deaths of three hostage-takers,** and the German scientist succumbed to his injuries. The operation immediately triggered diplomatic tensions: within the EU and NATO, some allies criticized Paris for acting too slowly, while Berlin condemned what it deemed a poorly prepared assault. The incident sent shockwaves across the globe.

Protests erupted in several major capitals in tribute to the environmental defenders and the scientist who were killed. In the slogans, France was accused of deliberately killing the hostage-takers, thereby violating the rights of environmental defenders and marginalized peoples. Aware of the resonance and potentially harmful consequences of such accusations, France sought to reaffirm its image as a responsible power, attentive to the region's fragilities and the urgent need to restore durable stability. Paris then announced the organization of an **extraordinary summit on Arctic ecological security, scheduled for October 13, 2044.** In a context where environmental vulnerabilities had become a

source of rivalry, **French diplomacy officially supported the demands of Indigenous peoples, advocating for a renewed approach to security** focused on prevention, mitigation, and the restoration of environmental damage, which could otherwise be exploited in conflict dynamics. **Within the French armed forces, the decision was divisive**: some saw it as a weakening of the national strategic posture in an international environment dominated by military competition, while others welcomed it as an ambitious and visionary approach adapted to ecological upheavals.

B. Recommendations

1

Preventing the use of climate vulnerabilities as a strategic lever by France's adversaries and competitors in a context of intensifying power rivalries

• Assess the climate and environmental vulnerabilities that could be used against French interests in strategically relevant areas.

• Anticipate the risks of the strategic exploitation of climate vulnerabilities in the context of increasing hybrid threats (forward-looking analysis, intelligence collection).

• Integrate the strategic use of climate vulnerabilities and their consequences into analyses of climate–conflict interactions, in order to account for them in national defence and security strategies (National Strategic Review, White Paper, etc.).

2

Promote a systemic vision of climate and ecological security among our allies and partners, at the European and international levels, through an interministerial approach led by DGRIS:

- Strengthen DGRIS collaboration with the Ministry for Europe and Foreign Affairs (MEAE) and the Ministry for Ecological Transition (MTE) to develop a holistic understanding of climate and ecological security.

- Incorporate the issue of mitigating and repairing environmental damage caused by conflicts into bilateral and multilateral dialogues – in coordination with the Ministry for Europe and Foreign Affairs (MEAE).
- Integrate the environmental consequences of conflicts and the continuum of instrumentalization–weaponization of climate vulnerabilities into European strategic thinking on climate security.
- Include, on the one hand, the concepts of ecological security and, on the other hand, the interaction between climate change and hybrid warfare practices in the next revision of the Climate-Defence Strategy.

3

Strengthen environmental protection in military operations to prevent feedback loops:

- Reinforce environmental protection within French rules of engagement for overseas operations (OPEX) and military exercises.
- Develop data collection capabilities on environmental degradation caused by conflicts to anticipate feedback effects in territories of strategic interest to France (mapping pollution, destruction of natural resources).
- Advocate for the strengthening of the international legal framework regarding environmental damage during conflicts.
- Implement environmental lessons learned (RETEX) following major operations or exercises.

4

Increase the role of defence actors within the framework of climate diplomacy:

- Engage more actively in climate negotiation channels to highlight the security challenges caused by environmental degradation from conflicts and the risks associated with climate inaction for the armed forces.
- Strengthen cooperation between public and private defence actors to address the environmental impacts of conflicts.

GLOSSARY

Agri-Food Vulnerabilities: The extent to which agro-food systems are susceptible to climate change, including climate variability and extreme events.

Climate Change: Variations in the state of the climate observed since the late 20th century, directly or indirectly attributable to human activity, altering the composition of the atmosphere. These variations manifest as both acute and slow-onset hazards, with environmental as well as security implications.

Climate Security: The consideration of climate change impacts on strategic context, geopolitical balances, military missions, and implementation resources, as well as associated anticipatory and adaptive measures (French Ministry of Armed Forces Climate-Defence Strategy, 2022).

Climate Vulnerability: Propensity or predisposition to be adversely affected by climate change (slow variation and rapid extreme events), dependent on natural environment sensitivity, human environment fragility, and adaptation policies.

Climate-Conflict Nexus: All interactions between climate change and conflict.

Climatization: The process by which a security issue is constructed as linked to, or caused by, climate change. The inverse process of securitization (see Oels, 2012).

Conflict / Conflict Dynamics: Situations in which coordinated and public actions by members of a social group, or an alliance of social groups (real or perceived), aim to assert or defend interests considered incompatible with those of at least one other social group or alliance (Ide, 2025).

Double Materiality: Concept introduced in 2024 by the EU Directive on corporate sustainability reporting, highlighting how companies and climate change interact and reinforce each other. In this report, it illustrates how conflicts and climate change mutually amplify through feedback loops.

Ecological Security: Introduced by Matt McDonald (2021), an approach focusing on ecosystem resilience, considering environmental and climate stability as essential for human, national, or international security, and central to threat prevention and management policies.

Ecosystem Services: Benefits provided to human societies by ecosystems, free of charge. They include resource production (energy, materials), carbon storage, landscape and recreational amenities, health benefits (reducing healthcare costs), water retention, and risk protection (*Géoconfluences*, 2025).

Endemic: Confined to a specific territory or country (Académie française dictionary).

Environmental Security: Human security achieved by proactively accounting for and minimizing (through adaptation) anthropogenic threats (degradation) and negative environmental pressures (exposure) on ecosystem integrity (sensitivity) and its human component (fragility). The goal is to reduce socio-economic system and population vulnerability.

Greenhouse Gases (GHGs): Gases that absorb infrared radiation emitted or reflected by the Earth's surface, raising its temperature beyond what it would be without GHGs. It is now widely recognized

that human emissions of GHGs amplify the greenhouse effect and significantly accelerate global atmospheric warming (*Géoconfluences*, 2025).

Human Security: The state of preserving and ensuring individuals' freedom and capacity to live in dignity, through development rather than weapons. It encompasses universal and culture-specific, material or immaterial elements essential to act in one's interest and live with dignity.

Hybrid Warfare: While widely used, the semantic framework of hybridity remains unclear with no universally accepted definition. It refers to the permeability between conventional and irregular warfare through the coordinated use by state and non-state actors of conventional, irregular, criminal, and non-military means (cyber, information, economic) to exploit an adversary's vulnerabilities while denying or concealing involvement.

Instrumentalization of Climate Vulnerabilities: Exploitation of vulnerabilities to influence, coerce, or harm a third party—whether a stakeholder or external actor—or to maximize one's own benefits within or around the conflict.

Issue-Linkage: Creating strategic connections between two political issues for leverage purposes.

Lawfare: Use of legal instruments to establish, maintain, or overturn a balance of power in order to coerce an adversary. Definitions vary and the term is controversial as it denotes the misuse of law. Though coined in the late 19th century, the practice is inherent to international law.

Planetary Boundaries: Thresholds of major global environmental systems that humanity should not exceed to preserve ecosystem stability and maintain favourable conditions for life. Nine have been identified: climate change, biodiversity loss, nitrogen and phosphorus cycle disruption, land-use change, ocean acidification, freshwater use, stratospheric ozone depletion, atmospheric aerosol increase, and introduction of novel entities into the biosphere.

Securitization: Process by which an issue is framed as an existential threat, requiring exceptional measures.

Strategic Lever: An element or dynamic—tangible or intangible, proven or perceived, material or immaterial—that an actor uses in a power relationship to exploit an event or situation.

Tchernozem Soil: Fertile black soil composed of loess and humus, found in dry continental climates, particularly in Ukraine.

Water Vulnerabilities: The extent to which access to and management of freshwater is susceptible to climate change, including climate variability and extreme events.

Weaponization of Climate Vulnerabilities: Direct use of vulnerabilities as material targets in armed confrontations, taking the form of physical destruction of critical infrastructure to weaken an adversary, coerce them, or recruit a group.

Weather and Climate Hazards: Natural meteorological or climate-related phenomena capable of causing damage.

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