AGILE INITIATIVE

OXFORD MARTIN SCHOOL

UNIVERSITY OF OXFORD

Weaponisation of Nature

PRIORITY POLICY QUESTIONS: SUMMARY OF KEY FINDINGS

Environment and National Security: Exploring the Risk Pathways

July 2026

About

This document is one of a series of reports from the Agile Initiative's Environment and National Security: Exploring the Risk Pathways project. The Priority Policy Questions: Summary of Key Findings reports respond to questions emerging from discussions with policymakers. Designed to be concise and accessible, each provides a list of key findings, a synthesis of available scientific evidence, a graphic illustrating the pathways between environmental pressures and national security, an explanation of the implications for UK national security, a list of priority policy recommendations, and description of relevant uncertainties and evidence gaps.

The Priority Policy Questions Series

- The role of critical natural infrastructure in supporting national security
- Managing demand: energy security, food security and UK national security
- Climate risks and opportunities for maritime shipping and UK trade
- Environment-driven mobilities and UK national security
- Weaponisation of nature
- Environment and social resilience

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Policy Questions

Q1

How can nature and weather be weaponised in current conflicts, including subthreshold and conventional warfare?

Q2

What indicators exist that might warn that states and non-state groups are taking steps to weaponise either nature or weather?

Q3

What are the environmental impacts and Critical National Infrastructure interdependencies that effect our ability to protect the UK from attempts to weaponise nature and weather?

Summary

- The UK's national security is at risk from the weaponization of nature today by the UK's adversaries, or even by its allies.

  Direct attacks on nature within UK sovereign territory by adversaries could impose severe damage to the UK's ecological balance, which would have cascading impacts on the resilience and productivity of the UK's natural resources and a destabilising effect on human welfare and social cohesion across the country.

  Like all countries**, the UK is also vulnerable to the destruction of nature and Earth systems in all parts of the world** by enemy or ally, especially if critical tipping points are breached, which can have disastrous impacts on UK national security.

  The weaponisation of nature in a globalised world in the era of climate change and biodiversity loss means that one country's environmental war is another country's food shortage, energy crisis, migration emergency, and biodiversity extinction risk. In the UK, the weaponization of nature in hybrid warfare poses a direct, immediate and significant risk.

Policy priority recommendations

Clarify and consolidate the concept: Build a shared, fit-for-purpose understanding of the weaponisation of nature across government and UK society.

Adopt a whole of government and whole-of-society strategic posture: Conserve and restore the UK natural environment through resilience schemes and build early warning systems around the risks to UK nature from climate change, hybrid warfare, and sabotage, including by launching a new public awareness campaign.

Ensure supply chain resilience: Guarantee the maintenance of UK energy, critical minerals, and food (using sustainable methods that protect Critical Natural Infrastructure).

Update legal and normative codification: Revive the Environmental Modification Convention; pursue the recognition of ecocide as the fifth international crime.

Uncertainties

Secrecy around policy and capabilities: Data gaps and restricted access to classified material prevent comprehensive research on the intentions and ability of the UK's adversaries to weaponize nature.

Risks of dual-use technologies: Whether, and the extent to which emerging dual-use technologies in geoengineering and life sciences, some of which are developed to support civilian adaptation to climate change, can be militarised remains uncertain.

Data and modelling accuracy: The long-term and precise modelling of the directly attributable impacts of nature weaponisation suffer from data collection difficulties during active conflict, and face challenges due to the multifactorial and cumulative causal chains that underpin environmental degradation.

States' commitment to international law: Growing disregard for humanitarian and environmental laws weakens the prospect of strengthening and augmenting existing nature protection standards.

Key Findings

In the 21st century, nature is weaponized **more frequently** by a **growing number of state and non-state actors**. (HIGH CONFIDENCE)

Weaponizing nature can cause **transboundary**, **cascading** and, at times, **irreversible harm** to ecosystems, earth systems, and social cohesion, with high restoration costs and decades of recovery. (MODERATE CONFIDENCE)

Emerging **dual-use technologies** may enable new forms of weaponisation of nature in **subthreshold** warfare. (LOW TO MODERATE CONFIDENCE)

Public discussion, legal instruments and government doctrine on the weaponization of nature **lacks conceptual clarity**. (MODERATE CONFIDENCE)

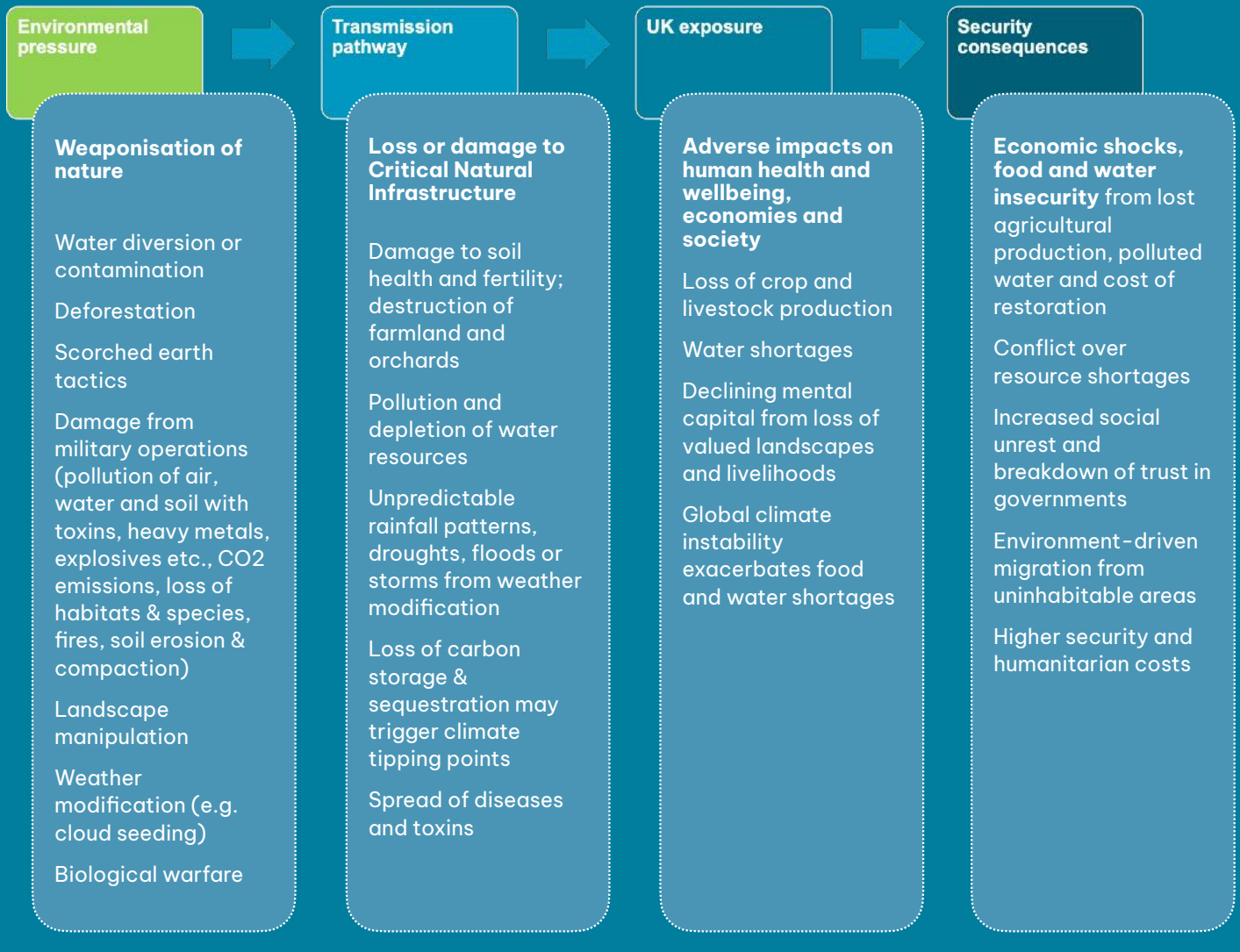
Implications for UK National Security

- Fighting through and about nature today may produce a domino effect of severe and enduring all-life disasters for a wide range of human and non-human populations, including displacement, food insecurity, environmental contamination, and health.

Cascading risks from the weaponization of nature around the world centres the Earth in UK security policy to make every attack on or through nature geostrategic and geoeconomic for the UK.

Horizon scanning on emerging threats needs to be conducted. If the UK does not collect and analyse the available data on the weaponization of nature and developments in geoengineering, it will fail to understand the risks presented by conventional and hybrid environmental warfare. As a result, it will be unable to protect UK citizens at home and ensure the UK's national interests and earth interests abroad.

Causal Pathway



Interventions: Revive ENMOD treaty, strengthen ecocide and reparations laws, protect critical natural infrastructure, monitor and warn of nature weaponisation activities

Evidence Synthesis

- The weaponisation of nature is the intentional use, manipulation, targeting, and destruction of environmental systems and natural resources in armed conflict and hybrid warfare.

  The laws of war give the natural environment civilian status. Nature cannot be the deliberate object of attack. But it is, and always has been, targeted by state forces and armed groups.

  Nature can be weaponized **topographically**, **biologically** and **atmospherically** in various ways. Nature is sometimes a **direct target** of destruction as in scorched earth strategies or water poisoning. At other times it works more as a **vector** which exposes people to extreme conditions through weather modification, deliberate flooding, insect infestation, or the manipulation of maritime chokepoints. Weaponizing fire sees nature both a vector and a target of destruction.

  The weaponization of nature has **three different levels of impact** by having significant effects **on nature itself, on human society, and on Earth systems**. These impacts take different forms of severity depending on how widely the damage impacts all life, and how deeply and permanently it damages the Earth.

  The weaponization of nature is as old as warfare itself. What is changing is its character, reshaped by several converging determinants: the advance of climate change, high international material interdependence in a globalized world, increasingly conspicuous disregard for international law, and rapid technological progress.

  Nature is weaponized **more frequently** in the twenty-first century because it is not just states that can inflict extensive damage to, and through, nature but also a **growing number of non-state and proxy agents.**[1] Current geopolitical trajectories suggest that this trend will persist, driven by the erosion of adherence to international public law and by falling technological barriers to entry to the targeting of nature in diffuse and ambiguous ways for asymmetric and hybrid ends. (HIGH CONFIDENCE)

  New forms of nature weaponisation are emerging with potential use in subthreshold warfare.[2] These are propelled by technological progress and new climate change opportunities like heatwaves and flooding. Some have already materialized. Others may arise imminently from dual-use technological innovations in geoengineering and life sciences. Evidence underpinning this finding is still limited but suggest that nascent techniques in cloud seeding, solar radiation management, and neurochemical engineering could potentially be adapted for use in the weaponization of nature. (LOW TO MODERATE CONFIDENCE)

  Weaponisation of nature today can produce transboundary, cascading and sometimes irreversible damage across three levels: nature itself, human society, and Earth systems.[3] Less extreme cases of nature targeting might still require huge costs in restoration (many billions of GBP) and decades of nature recovery. The most severe cases hold the prospect of spreading widely

and deeply enough around the world to increase the risk of irreversible Earth-system tipping-points. These impact risks are exacerbated by the escalating ecological stress found in many Earth systems already and by the growing interdependence of global trade. The UK's vulnerability is planetary in that environmental damage overseas can quickly become food insecurity, energy disruption, environmental change, migration pressure, and biodiversity loss in the UK and its strategic geography. (MODERATE CONFIDENCE)

Scholarship, public policy, legal instruments, and military doctrine on the weaponisation of nature are fragmented and conceptually outdated.[4] Certain subjects have received ample attention (e.g., water weaponisation) but much of the wider literature remains backward focused on the Cold War, rudimentary environmental warfare technologies, and overt practices that increasingly diverge from present and future threats. While certain forms of weaponization, such as forest defoliation, are widely recognised, debates persist over whether cases involving critical infrastructure (such as nuclear power plants), natural resources extraction (including hydrocarbons and critical minerals) and the aggressive manipulation of environmental policy ("polfare") constitute weaponization or not. (MODERATE CONFIDENCE)

Policy Recommendations

Clarify and consolidate the concept

Launch a cross-government initiative to consolidate Whitehall research and policy thinking on the weaponisation of nature.

Develop a shared and updated definition (intent, means and effects) and policy discourse (language and terminology) while preserving secrecy and strategic ambiguity where disclosure is contrary to UK interests.

Adopt a whole of government and whole-of-society strategic posture

Agree a national "protect and prepare" posture to address weaponization of nature risks domestically and abroad, which prioritizes environmental protection, food and water security, biodiversity, nature-based supply chains and nature-based infrastructure.

Ensure whole-of-society preparedness through early warning systems and public awareness campaigns that engage in UK-wide scenario planning for overlapping and compounding threats.

Ensure supply chain resilience

Map the UK's direct and indirect global nature dependencies and establish integrated early-warning systems across energy, food, water and industrial security for proximate and distant supply-chain vulnerabilities.

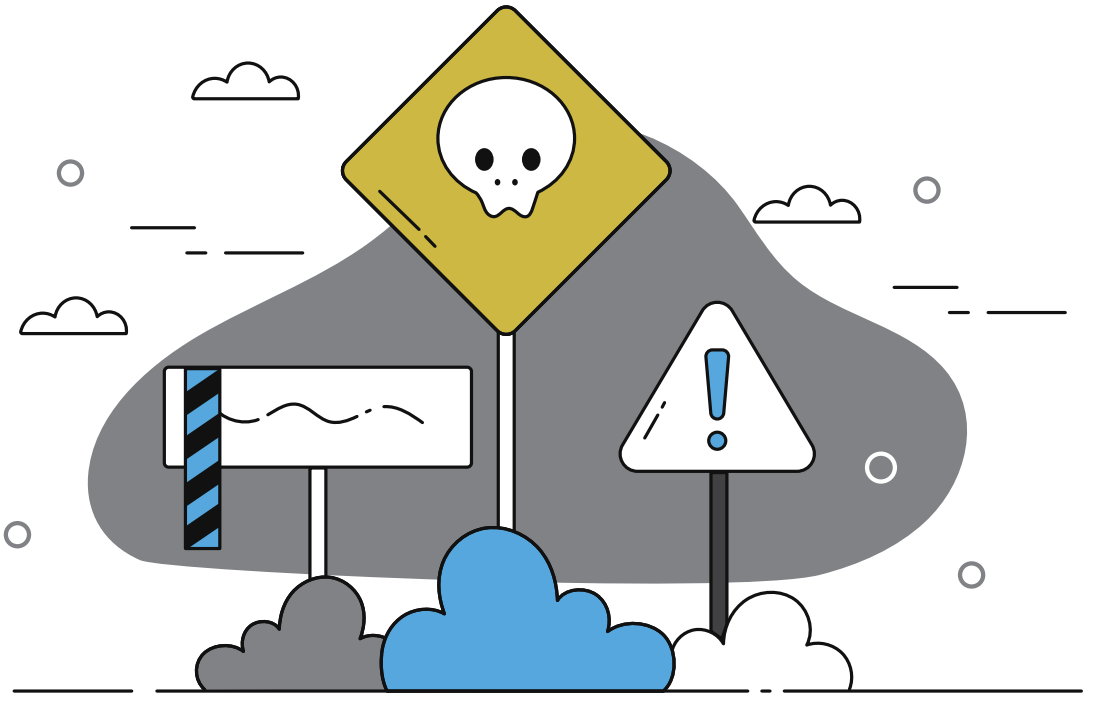
Strengthen strategic optionality through diversified suppliers, resilient energy, food, water, and industrial sourcing and infrastructure, and expand domestic and allied capacity for critical-mineral recycling, stockpiling, and processing.

Agree measurable reliability and minimum standards for food and critical minerals security and regularly assess the security risks associated with infrastructure, including nuclear facilities.

Update legal and normative codification

Revive the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD) by building the ten-state coalition required to convene a review conference or, failing that, requesting a Consultative Committee of Experts under Article V(1).

Pursue recognition of ecocide as a fifth international crime; if this remains politically unattainable, incorporate environmental tipping points into international humanitarian law and lower the thresholds for environmental destruction to constitute a war crime.



Recommendation	Actors	Time frame	Evidence Confidence	Implementation complexity	Key dependencies, trade-offs
Conceptual consolidation	Whitehall, Cabinet Office, MOD, Defra, FCDO, MOD	0–2 yr	MODERATE	MODERATE	Cross-government agreement; Willingness to resolve strategic ambiguity Clearer definitions may reduce kinetic flexibility in warfare, but improve policy coherence and legal clarity
Strategic posture	Defra, Home Office, DESNZ	0-2 yr	HIGH	HIGH	Joined-up risk ownership; Sustained coordination Cost and administrative load versus improvements in readiness for fires, flooding, sabotage, and cascade effects
Supply chain resilience	Cabinet Office, DBT, DESNZ, Defra, FCDO, HMT	0–5 yr	MODERATE-HIGH	HIGH	Data access; Interdepartmental cooperation; International intelligence-sharing; Market incentives; Planning; Public acceptability May entail immediate increased costs for sourcing in supply chains, but in return for greater resilience and flexibility in the long-term
Legal and normative codification	FCDO, Cabinet Office, UK Mission to the UN, Whitehall	2–10 yr	HIGH	HIGH	Domestic political appetite; International coalition-building May entail diplomatic difficulty only to result in weak enforcement, but the effort would close the current legal accountability gap and would support long-term norm change

Uncertainty and Priority Evidence Gaps

What is known

A rich body of historical and contemporary scholarship examines the weaponisation of nature as an enduring method of warfare in international armed conflicts. Across different periods and multiple theatres of war, this literature documents practices such as scorched earth tactics, water weaponisation, deforestation, defoliation and weather modification.

There is a growing evidence base on the deployment of weaponisation of nature in grey zone and subthreshold warfare and under the banner of terrorism in the 21st century by a growing diversity of non-state actors.

The literature is relatively robust in demonstrating that environmental harm can generate cascading ecological, economic, and security consequences.

What is uncertain

Data collection challenges during active conflict hinder the documentation of environmental war crimes, complicating both the assessment of nature weaponisation and the attribution of harm to specific belligerents.

The extent to which emerging dual-use technologies developed primarily for civilian purposes in geoengineering, the life sciences, and other frontier fields may be deployed in future armed conflicts is not yet clear.

The scale, duration, and reversibility of the impacts of nature weaponisation are difficult to establish, particularly where multiple environmental stressors interact. Climate change further complicates these assessments by obscuring the magnitude, timing, and interaction of climate-driven hazards with deliberate environmental harm.

Although evidence of the benefits of strengthening resilience is growing, significant uncertainties remain regarding appetite for international cooperation, implementational feasibility, and the adequacy of existing legal frameworks.

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