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Governing climate risks as national security priority

Call to re-examine Malaysia's reactive approach to environmental hazards

Research note

By

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Foreword by

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ISIS Malaysia

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Foreword

Peace is often understood simply as the absence of conflict. Yet peace, in its fuller sense, rests equally upon the resilience of institutions, the confidence citizens place in them and the capacity of societies to manage change without allowing divisions to deepen. It is sustained not only through security but also through good governance, social cohesion and public trust. Climate change, therefore, presents a challenge that extends well beyond the environmental domain. While discussions have understandably focused on emissions, adaptation and mitigation, their implications for governance, social stability and national resilience deserve equal attention.

This research note makes an important contribution by examining climate change through the lens of non-traditional security. It argues persuasively that climate risks do not affect all communities equally. Their consequences are often felt most acutely by those with the least capacity to adapt, particularly where socio-economic vulnerabilities and governance constraints already exist. Left unaddressed, such disparities may deepen existing inequalities, weaken public confidence in institutions and place additional pressure on the social fabric that underpins long-term stability. Climate change, in this sense, is not merely an environmental challenge. It is also a governance challenge, a development challenge and increasingly, a security challenge.

Recognising climate change as a non-traditional security issue should not be interpreted as an argument for militarising the climate agenda. Rather, it is a recognition that climate-related risks warrant the same degree of strategic attention, policy coordination and institutional commitment that governments devote to other security challenges with significant implications for national stability. Effective responses will depend on strengthening resilience through sound institutions, inclusive governance and coherent public policy.

As Malaysia continues to strengthen its climate resilience and advance its sustainable development agenda, research of this nature serves an important public purpose. By connecting environmental change with questions of governance, social cohesion and national security, it encourages a broader and more integrated policy conversation. It is my hope that the insights and recommendations contained in this research note will contribute meaningfully to that conversation and inform policy deliberations in the years ahead.

Datuk Prof Dr Mohd Faiz Abdullah

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Executive summary

- Climate change is increasingly becoming a driver of instability in Malaysia. Physical stressors, such as flooding, heat, dry spells, coastal erosion and haze, are concentrated most heavily in states affected by poverty and governance burdens.
- However, Malaysia's approach to climate change has remained largely reactive and mitigation-focused. There has not been a corresponding shift towards treating it as a non-traditional security priority. This gap in framing is compounded by governance architecture that lacks the capacity to manage risks, as it remains fragmented across federal and state lines and shaped by environmental justice deficits that disproportionately burden marginalised communities with climate costs.
- An examination of specific risk areas – including forced migration, climate health, and loss and damage – reveals how fragmentation plays out in practice, and how climate risk extends beyond the domestic scale through Malaysia's integration into regional supply chains, decarbonisation and exposure to external climate-linked trade measures.
- Therefore, climate change should be considered through a peace and security lens because its effects erode the stable, cooperative relations within communities as well as between citizens and the state. This is despite climate change remaining classified as a non-traditional security risk. Left unaddressed, these pressures compound existing inequality, cause displacement and fuel institutional distrust.
- Recommendations include formally designating climate change as a non-traditional security priority through a dedicated inter-ministerial climate security council, developing a disaggregated climate vulnerability mapping protocol for the most exposed communities, treating the low-carbon transition as a peace and economic security challenge, establishing a national framework for climate-related displacement and Malaysia taking the lead on assessing ASEAN's climate, peace and security measures.

Abbreviations

AR6	Sixth Assessment Report
CPS	Climate, peace and security
DOSM	Department of Statistics Malaysia
EU	European Union
IPCC	Intergovernmental Panel on Climate Change
MAIN	Malaysia Adaptation Index
MKN	Majlis Keselamatan Negara (National Security Council)
Nadma	National Disaster Management Agency
ND-GAIN	Notre Dame Global Adaptation Initiative
NETR	National Energy Transition Roadmap
NPHAP	National Planetary Health Action Plan
NRES	Natural Resources and Environmental Sustainability Ministry
OECD	Organisation for Economic Cooperation
SME	Small- and medium-sized enterprise
UNDP	UN Development Programme

1.0 Introduction

The world is fast approaching a series of irreversible climate tipping points. According to the Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) – the leading authority on climate science – the effects of human-induced warming have reached unprecedented levels. Its effects include extreme temperatures and weather events, biodiversity loss, sea level rise and ocean acidification. Based on current trajectories, the world is poised to overshoot the limit enshrined in the Paris Agreement, which calls for the increase of global average surface temperature to be limited to 1.5°C above pre-industrial levels, where possible.

The increasing severity of climate-related impacts on natural ecosystems and human lives can no longer be avoided or downplayed. These impacts are not merely ecological. Climate pressures have wide-ranging impacts on the economic, social and political arrangements holding communities together. Indeed, climate change has been recognised as a threat to human security for over a decade, as the IPCC's Fifth Assessment Report concluded in 2014, by causing food insecurity, loss of land, forced displacement and damage to livelihoods.¹ It exacerbates the risk of violent conflict by impacting upon sociocultural resilience and community wellbeing. In these ways, climate change becomes a threat multiplier by compounding existing stress points – for instance, precarity and deprivation, weak infrastructure and institutional capacity – and creating cascading peace and security risks across communities, systems and borders. Therefore, long-term actions and systemic transformations are needed to confront climate change and its interlinked global emergencies of biodiversity loss and pollution.

Malaysia has yet to approach climate impacts as interconnected threats to national resilience and peace but has instead conceptualised them as isolated environmental hazards to be managed reactively. Current climate governance has mostly focused on mitigating emissions (pursued through environmental and energy policies, such as the National Energy Transition Roadmap, NETR) and disaster response (pursued through national disaster management apparatus such as the National Disaster Management Agency, Nadma, and its governing National Risk Reduction Policy 2030). While these approaches are essential, they do not fully address how climate risks increasingly interact with trade, infrastructure, livelihoods and regional stability, where negative impacts are becoming more frequent and interconnected across national borders. In short, climate broadly remains outside the purview of national resilience frameworks and the broader regional mechanisms managing transboundary threats.

This research note maps climate-related risks and asks how recognising climate change as a non-traditional security agenda reshapes nation-building priorities and strengthens regional climate resilience. In doing so, it approaches climate risk through a human security, peace and planetary security lens, rather than as a “hard” security problem to be met militarily. Peace, in this context, describes the stable and cooperative relations within communities as well as between citizens and the state.

Climate risks erode these conditions through disasters, ecological degradation and geographical vulnerabilities. Because they affect human existence and wellbeing directly, current frameworks could lead to the militarisation of climate responses or the securitisation of climate refugees.

Section 2 sets out Malaysia's climate risk profile and governance mechanisms before analysing security risks in the two subsequent sections. Section 3 examines direct and indirect climate-related domestic security risks, while Section 4 turns to the potentially wider impacts on complex and interdependent systems. Section 5 concludes with policy recommendations.

2.0 Malaysia's climate risk profile and governance

2.1 Risk overview at the national and international scales

Before Malaysia's climate security risks can be assessed, the physical stressors driving them need to be identified to determine which states bear the greatest exposure. The domestic climate landscape is defined by its interactions with physical stressors, such as extreme heat, intense rainfall and flooding, sea level rise and coastal change, extreme drought and water stress as well as recurring transboundary haze.²

The states' relative levels of climate exposure are uneven, as gauged by their Malaysia Adaptation Index (MAIN) rankings, which summarise their respective vulnerabilities and readiness to face the impacts of climate change (Table 1). Its methodology draws partly from the Notre Dame Global Adaptation Initiative (ND-GAIN) country index, which assesses vulnerability across key sectors – food, water, health, ecosystem services, human habitat and infrastructure – alongside economic, governance and social readiness.

The sharpest climate pressures are concentrated in Sabah and Sarawak, and along the east coast of the peninsula. Kelantan and Terengganu rank bottom overall, with Sabah, Sarawak and Pahang also classified among the vulnerable states. This pattern of exposure correlates with recent hazard experiences. For example, during the 2024 heatwave, level two alerts were issued in Kelantan and Pahang, while Sabah, Sarawak and Terengganu also recorded heat-risk conditions. By mid-2024, 45 cases of heat-related illness and two deaths were recorded, while drought conditions affected more than 75,000 families, including more than 58,000 in Sabah.³ Even today, more than 40% of Malaysia's outdoor workers report symptoms of heat-related illness.⁴

On the international scale, Malaysia has a mid-tier ND-GAIN profile (ranking 49th), which suggests that its national readiness masks sharper subnational fragilities. Malaysia is comparatively favourably ranked within Southeast Asia, signalling a relatively greater capacity to manage climate pressures than most states, such as Thailand, Indonesia, Vietnam and the Philippines. Yet, it remains exposed to significant sectoral and

Table 1. Sabah, Sarawak, Kedah, Terengganu and Kelantan rank in the bottom five of the MAIN index

State	Ranking		
	MAIN	Vulnerability*	Readiness**
WP Kuala Lumpur	1	2	1
Selangor	2	4	2
Melaka	3	1	4
Johor	4	10	3
Negeri Sembilan	5	5	9
Penang	6	7	4
Perak	7	3	10
Perlis	8	7	8
Pahang	9	13	4
Sabah	10	11	12
Sarawak	11	5	11
Kedah	12	7	12
Terengganu	13	14	4
Kelantan	14	11	14

Source: MAIN. States are ranked 1 (best) to 14 (worst) for each measure. Although Kelantan and Terengganu hold the two lowest overall rankings, Terengganu does have a comparatively strong readiness ranking (4) relative to its high vulnerability. Meanwhile, Kelantan holds the worst readiness ranking (14) and the second-worst vulnerability ranking⁶

Explanatory notes:

* Vulnerability measures a country's exposure, sensitivity and ability to adapt to the negative impacts of climate change. ND-GAIN measures overall vulnerability by considering six life-supporting sectors: food, water, health, ecosystem services, human habitat and infrastructure.

** Readiness measures a country's ability to leverage on investments and convert them to adaptation actions. ND-GAIN measures overall readiness by considering three components: economic readiness, governance readiness and social readiness.

subnational risks, besides remaining behind Singapore and scoring lower than Brunei in terms of readiness (Table 2).

Overall, Malaysia's regional position reflects moderate national readiness alongside substantial exposure to regional climate risks originating from beyond its borders. After all, Southeast Asian economies are closely connected through food imports, manufacturing networks, labour mobility and shared ecosystems. Climate-related reductions in agricultural and fisheries production, infrastructure disruptions and human displacement recognise no borders: they can be experienced in Malaysia in the form of higher food prices, supply chain interruptions, migration pressures and transboundary hazards, for instance.⁶ Similarly, IPCC finds that climate impacts on food systems, infrastructure and displacement are differentiated but interconnected across Southeast Asia.

Table 2. Malaysia ranks second in Southeast Asia, behind Singapore, in terms of national readiness on the ND-GAIN index

Country	Ranking		
	ND-GAIN	Vulnerability	Readiness
Singapore	5	75	1
Malaysia	49	51	54
Brunei	51	80	41
Thailand	70	103	63
Indonesia	97	97	101
Vietnam	101	122	92
Philippines	110	109	122
Laos	131	130	137
Timor-Leste	134	157	105
Cambodia	146	126	157
Myanmar	168	145	179

Source: ND-GAIN country index⁷

Note: 190 countries are ranked, with 1 indicating the highest position for each measure. Malaysia holds the second-highest overall ranking in this group (while ranking 49th globally), well behind Singapore (5) but ahead of Brunei (51), its next-closest regional competitor. Malaysia's three scores are close together (49, 51, 54), suggesting that further improvements to its regional position require progress on its preparedness to reduce vulnerability. This is unlike Singapore, whose strong overall position rests almost entirely on its readiness ranking (1), despite greater vulnerability (75) than Malaysia (51). Myanmar holds the lowest overall ranking, driven mainly by having the worst readiness (179).

Overall, exposure patterns matter just as much for adaptation when it comes to security planning. This regional comparison shows that Malaysia's climate security depends on the resilience of wider Southeast Asian systems. However, the task of strengthening its domestic adaptive capabilities remains just as crucial. The states carrying the heaviest physical burdens are largely the same ones most exposed to displacement, strained healthcare systems and external trade shocks, as discussed below. Climate risk and insufficient governance capacity are, therefore, concentrated in the same places, which convert physical exposure into a peace and security concern.

2.2 Existing climate governance mechanisms

Governance capacity is a key determinant of whether a climate stressor becomes a security risk. Recent assessments suggest that Malaysia's key problem is not an absence of political commitment. The larger problem is that climate governance is currently distributed across institutions which are not necessarily aligned with the risks that they are required to manage.

From the AR6 Working Group II assessment, such fragmentation “locks in existing exposures and vulnerabilities”, where climate stress and state capacity are correlated.⁸ Specifically, the states facing the greatest climate stress are often those with the weakest governance capacity. Two intersecting governance challenges are structural producers of vulnerability: (1) fragmented jurisdiction across federal and state lines; and (2) environmental justice deficits that determine which communities bear climate costs and are able to access adaptation resources. It is necessary to develop a concise understanding of both challenges before analysing how these dynamics play out across specific risk areas.

First, Malaysia’s federal structure means that climate policy coordination involves more parties than a unitary system does. Land, forests, agriculture and riverine resources fall under state jurisdiction, leaving the federal government with only an advisory role.⁹ Sabah and Sarawak’s respective arrangements under the Malaysia Agreement 1963 add complexity, since they retain authority over natural resources and are excluded from national land use councils, unlike other states. Climate-related mandates are split primarily between the Natural Resources and Environmental Sustainability Ministry (NRES, which oversees environmental and natural resource policy) and Energy Transition and Water Transformation Ministry (Petra, which governs the energy and water sectors), alongside other ministries and agencies holding partial climate responsibilities. In fact, Sarawak and Sabah have developed parallel arrangements. Sarawak splits responsibility between its Energy and Environmental Sustainability Ministry and Natural Resources and Urban Development Ministry, while Sabah centralises coordination within the Chief Minister’s Department, supported by the Sabah Climate Change Action Council.

Such fragmentation reflects the absence of a single ministry with overall authority over climate policy, while the window for anticipatory action is closing. Malaysia’s Subnational Climate Change Institutional Assessment found continued gaps in intergovernmental coordination, technical capability and data consolidation, despite growing recognition of climate risks.¹⁰ The result is a resilient status quo where institutions preserve existing administrative arrangements, even when these contribute to vulnerability.¹¹ The federal Climate Change Bill and first National Adaptation Plan do represent a generational opportunity to codify vertical coordination, but their success is contingent upon the resolution of federal-state ambiguities.

Second, governance capacity is also shaped by environmental justice concerns. Kelantan, Terengganu, Sabah and Pahang combine high hazard exposure with elevated poverty levels or weaker coping capacity (Fig. 1). For instance, Kelantan records the highest poverty incidence rate in the peninsula and has the highest flood exposure risks. Evidence from local farming communities indicates that households commonly respond to shocks by reducing consumption, taking out loans or selling limited assets.¹² Marginalisation is thus compounded by the elevated experience of flooding.

Taken together, Malaysia's climate coordination and governance capacity, or the lack thereof, turn physical climate risks into a governance risk that could impact peace and security. How do these play out across different domains of climate risk and in complex and interdependent systems?

Fig. 1. Poverty and flood exposure overlap most heavily in Kelantan, one of Malaysia's poorest states



Legend

- High vulnerability (poverty >10%, exposure >70)
- Medium vulnerability
- Lower vulnerability

Source: authors' analysis of the national poverty rate and flood exposure index data from the Department of Statistics Malaysia (DOSM)¹³

Note: selected states are plotted by poverty rate (x-axis) against the flood exposure index (0-100) (y-axis) and are classified as 'high vulnerability' states if they meet a set threshold for poverty and exposure (poverty >10%, exposure >70). Therefore, Kelantan and Sabah, which have Malaysia's highest poverty rates, are classified differently. Sabah's flood exposure index (65) falls below the flood exposure index threshold (70). Consequently, it does not experience the same 'high vulnerability' of Kelantan. However, Terengganu (poverty rate 14.1%, exposure 82) meets both the poverty and exposure thresholds and may warrant inclusion in the 'high vulnerability' category.

3.0 Direct and indirect climate-related domestic security risks

Climate change is increasingly recognised as a threat multiplier that exposes and accelerates present challenges within national systems. For a federation navigating asymmetric constitutional arrangements, unequally distributed federal mandates and significant subnational variation in adaptive capacity, this reality carries weight.

The authors engaged in a roundtable exercise with policymakers, government agencies and civil society actors to identify the domains where physical exposure, socioeconomic vulnerability and governance capacity intersected most sharply with Malaysia's climate landscape. The Climate, Peace and Security (CPS) Toolbox was applied to each risk area in turn. Developed by the United Nations' Climate Security Mechanism, the toolbox structures analyses around three questions: (1) which climate stressors or shocks are most relevant; (2) who or what is exposed, and where and when; and (3) what governance capacity exists to manage the risk, and where does it fall short?

Fig. 2. The CPS Toolbox framework¹⁴

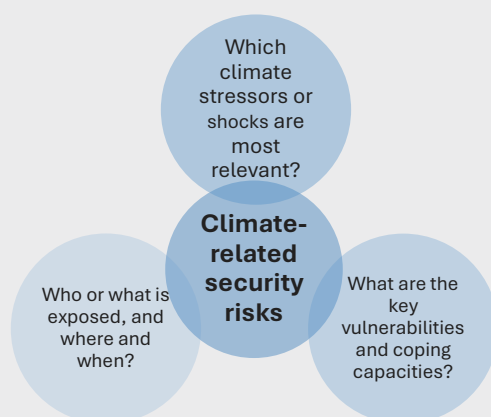


Table 3. Question structure for each risk identified through the CPS Toolbox¹⁵

Section	CPS Toolbox framing
Environmental stressors	Which climate stressors or shocks are most relevant?
Socioeconomic vulnerabilities	Who or what is exposed, and where and when?
Governance and political capacity	What are the key vulnerabilities and coping capacities?

Note: these three questions apply to risks arising from the direct and indirect effects of climate change, and are examined in Subsections 3.1 and 3.3.

Three domains where this analysis is most pressing are: (1) forced migration and displacement; (2) climate health and security; and (3) loss and damage. Across these domains, climate change interacts with existing national vulnerabilities to produce conditions of instability, each characterised by compounding risks. Combined, they make a case that recognising climate change as a non-traditional security priority is a prerequisite for nation-building in Malaysia.

3.1 Forced migration and displacement

Climate-induced displacement removes people from the legal, social and economic protections that otherwise prevent resource competition and social tensions from escalating.¹⁶ It also unevenly displaces vulnerable groups such as children, women and elders, who face the highest risk exposure due to the lack of displacement governance mechanisms specifically addressing these groups.

3.1.1 Environmental stressors

Flooding, coastal erosion and prolonged drought drive most climate-related displacement in Malaysia (most apparent in the states carrying the heaviest poverty burdens) and across the region. Stakeholders repeatedly identified Malaysia's sharp increase in extreme rainfall, which led to a higher frequency of flooding, as the main stressor of concern. Floods displaced 129,000 people in 2021 and 156,000 in 2022, concentrated in Kelantan, Terengganu, Sabah, Sarawak and Pahang, and climate change could displace an estimated quarter of the population by 2030.¹⁷

Apart from flooding, slow coastal erosion is also an increasingly apparent climate risk. Erosion pushes fishing communities further inland over time, such as seen in Selangor and Batu Pahat, where relocations of villages, plantations and infrastructure have occurred.¹⁸ Meanwhile, drought and saltwater intrusion reduce agricultural livelihoods, pushing rural households towards towns or across borders. This dynamic, already visible among farmers in Vietnam's Mekong Delta, is emerging among padi farmers in Kedah and Perlis experiencing salinisation.¹⁹

Malaysia's neighbours experience similar stressors, albeit at greater scale. In 2023, storms and floods caused 81% of the 2.6 million disaster-related displacements recorded in the Philippines, which is in one of the world's most active typhoon belts.²⁰ In Indonesia, Jakarta is sinking by up to 10cm a year as sea levels rise regionally.

3.1.2 Socioeconomic vulnerabilities

Domestically, the Internal Displacement Monitoring Centre recorded 354,000 climate-related internal displacements between 2016 and 2021.²¹ Housing damage was concentrated in Sarawak, Sabah and Johor. For flood-prone communities in the Klang Valley, household income was the primary determinant of migration intention in response to flood risk.²² Lower-income households are the most exposed to

displacement but also the least able to relocate permanently, thus cycling through repeated evacuations without durable resolution.

For comparison, Cyclone Senyar in Indonesia coincided with monsoon rains that killed more than 1,100 people, damaged more than 166,000 homes and displaced more than a million residents in November 2025. The situation was worsened by decades of deforestation, which stripped hillsides of the forest cover once able to absorb rainfall. The aftermath showed how climate disasters could bring about security risks. Many displaced households were classified as “not meeting the criteria” for housing assistance, despite the extensive damage to their homes, leaving them without income for months while being dependent on government aid.²³ If a similar disaster were to befall Malaysia, many would be trapped in similar income-based patterns of marginalisation, where the most vulnerable would face cycles of displacement.

Among displaced and flood-affected populations specifically, harm concentrates unevenly by age and gender. These are factors which current relief planning does not consistently account for. Children face the most direct exposure to secondary harm. Many of Malaysia’s evacuation centres lack adequate sanitation, potable water and waste management, conditions linked to an elevated risk of waterborne illnesses, including cholera, leptospirosis and diarrhoea, specifically among children.²⁴ Displacement also interrupts schooling and regionally, economic pressure on displaced families pushed some households towards harmful coping strategies.²⁵ Older demographics are also vulnerable since they face the highest mortality and health risks once evacuations begin. In Malaysia, nursing home residents and those requiring continuous medication face the same kinds of evacuation and shelter-in-place challenges as those observed during Hurricane Katrina in the United States, where 71% of fatalities were aged above 60.²⁶

As for women and girls, they face heightened risks of gender-based violence during evacuations and sheltering. Across multiple disaster contexts, including within Southeast Asia, they face greater risk of sexual violence and exploitation in evacuation shelters, driven by the loss of housing and support structures, disrupted access to services and inadequate separation of shared facilities.²⁷ During Malaysia’s 2024 floods, which displaced more than 52,000 people across 25 districts in seven states and activated 385 evacuation centres, similar structural gaps existed – crowded facilities and lack of privacy – even though risks did not reach the same degree of severity documented in comparable regional disasters.²⁸

3.1.3 Governance and political capacity

The National Policy on Climate Change 2.0 acknowledges displacement as a risk, yet legal mechanisms to cushion its impacts remain absent. This is one of the most significant operational failures in Malaysia’s current climate governance framework.

Further, Malaysia already hosts one of Southeast Asia’s largest populations of refugees and undocumented migrants, despite lacking a coherent legal framework to offer

protection. Given heightened regional climate vulnerabilities, Malaysia could see future climate refugees, who would likely face the same administrative uncertainties as existing refugee communities, such as the Rohingya.* Although the regional dimension of climate-induced displacement carries great long-term security weight, Malaysia is neither a signatory to the 1951 Refugee Convention nor its 1967 Protocol. The absence of domestic refugee legislation means that regional climate refugees would have no legal recognition and, by extension, lack rights to a livelihood and formal access to services. The core of this risk is Malaysia's continued treatment of displacement as a temporary event, rather than as a structural governance challenge, which causes resource competition and tensions between refugees, host communities and the state.

3.2 Climate health and security

Although the box article below does not apply the toolbox directly, it engages with the third framing – governance and political capacity. By mapping governance structures and the arising key structural weaknesses, it makes a case for classifying climate health as a non-traditional security concern. This refers to the direct and indirect effects of climate change and environmental degradation on physical and mental health, the functioning of health systems and wider conditions shaping wellbeing, including access to food, water, housing and livelihoods. In doing so, we allow for a more comprehensive framework to address climate stressors and their impacts upon vulnerable populations.

The systemic character of climate health was emphasised by Prof Tan Sri Jemilah Mahmood, who represented the Sunway Centre for Planetary Health at PRAXIS 2025. After all, climate change presents an interconnected security threat to health, food systems, infrastructure and regional stability. Treating climate health as a security priority, therefore, provides a more comprehensive basis for coordinating responses to climate stressors and protecting populations with the greatest exposure, yet also the fewest resources.

* The Rohingya crisis led to Malaysia hosting more than 120,000 refugees and asylum seekers. The 2017 exodus of an estimated 700,000 Rohingya, the lack of formal means to address their arrival, and the resulting social tensions, legal uncertainties and social marginalisation are indicative of the scale of the crisis. See: Muzliza Mustafa. (2026). Rohingya refugees and anti-Rohingya sentiment in Malaysia. *The Straits Times*.

Box article: Case for climate health as a security priority

By the Sunway Centre for Planetary Health

Whether or not climate change should be considered a national security issue is fundamentally a question about governance design. Non-traditional security frameworks, long established in ASEAN scholarship, define security in relation to human wellbeing and societal stability, rather than territorial integrity. Under this definition, climate change qualifies, being transnational in origin, non-military in mechanism and systemic in its consequences. Here, the key question is what changes structurally when Malaysia applies a non-traditional security framework.

Climate change does not generate insecurity by itself but rather, systemically degrades the institutional and social buffers otherwise able to absorb its effects. Take the vulnerabilities exposed by the 2024 Southeast Asian heatwave, for instance.²⁹ Heat related illness disproportionately impacted upon outdoor and manual workers in construction, agriculture and manufacturing, thus compounding income losses, food security risks and existing pressures on social protection systems. Meanwhile, the ASEAN Agreement on Transboundary Haze Pollution was meant to address a similar regional threat by addressing the political economy of peatland drainage. However, its persistent inadequacy in terms of enforcement and subnational reach is a standing reminder that climate-driven health threats can outpace the multilateral frameworks meant to contain them. At the same time, documented psychological distress among flood-displaced communities carries other security implications.³⁰ Communities with diminished social cohesion and eroded institutional trust are more likely to suffer reduced capacity to absorb subsequent crises and have reduced confidence in the state's willingness to protect them.

Malaysia's climate governance is primarily NRES's responsibility, with disaster response managed reactively by Nadma. There is no standing mechanism to integrate climate risk projections into national security planning, no live surveillance system connecting meteorological hazard data to disease outbreak intelligence and no public infrastructure investment standard incorporating forward-looking climate resilience. These are significant structural weaknesses in a country already absorbing serious climate costs.

These gaps are not unacknowledged. Malaysia's National Planetary Health Action Plan (NPHAP) – the first formal document of its kind globally – was launched in November 2025 and is explicitly designed to integrate ecological stability with human health and economic resilience government-wide through a whole-of-nation approach. Malaysia's third Nationally Determined Contributions plan, submitted in October 2025, is committed to an economy-

wide peak in carbon emissions by 2030 and anchors the National Adaptation Plan through 2035.³¹ Malaysia's engagement at the 30th Conference of Parties in Belém included leading discussions on climate security and planetary health, thus demonstrating its standing as a credible regional voice on climate governance.³²

In short, Malaysia has the frameworks, regional standing and evidence base to lead this agenda. However, the authority of a formal security designation remains lacking, without which climate health governance remains beyond the National Security Council's (Majlis Keselamatan Negara, MKN) mandate. Resolving this single structural gap would enable coordination, long-term planning and dedicated resourcing for genuine security priorities. Crucially, this action must be treated as genuine reorientation and not just administrative relabelling.

The argument for treating climate change as a non-traditional security issue no longer requires elaboration. The evidence is extensive, the institutional architecture largely exists and the pathway is clear. What remains lacking is political will. Formally designating climate security within the MKN's mandate, backed by NPHAP's crossministerial structure, means that climate health is no longer limited to sustainability programming but is incorporated into security planning. This shift in framing carries real consequences for resourcing, coordination and the communities already absorbing costs that policy has yet to address. The case for acting is compelling. The case for delay is not.

3.3 Loss and damage

The concept of "loss and damage" is closely tied to climate security. AR6's "Summary for policymakers" defines it as "adverse observed impacts and/or projected risks and can be economic and/or non-economic", indicating impacts that actors can no longer recover from.³³ Non-economic losses and damages, in particular, refer to the social impacts of climate change, which affect biodiversity and cultural preservation, while causing human displacement and loss of livelihoods.³⁴

Two interlinked questions raised during the roundtable discussion were what happens: (1) once adaptation stops working for Malaysia; and (2) if Malaysia can no longer keep pace with worsening climate impacts? Malaysia has yet to reach the "hard" adaptation limits currently witnessed by low-lying island states. There, physical environmental changes have become so severe that no feasible adaptation measure can prevent intolerable losses, even with sufficient finance, technology and institutional capacity. For Malaysia, the more immediate challenge is addressing "soft" limits, where available technical measures remain inaccessible because of inadequate financing,

fragmented governance, limited data and weak implementation. Unlike hard limits, soft limits may still be overcome.

3.3.1 Environmental stressors

The key point is not simply that Malaysia is warming but that heavier rainfall, warmer baseline conditions and more volatile hydro-climatic behaviours increase the frequency by which “ordinary” adaptation systems are overwhelmed.

Recurrent flooding provides the clearest evidence of how residual losses accumulate. Floods cost Malaysia RM6.1 billion in recorded losses in 2021, while annual losses reached RM933.4 million in 2024.³⁵ These events damaged homes, agricultural land, businesses, vehicles and public infrastructure. Although loss figures can appear manageable if viewed as separate annual shocks, their security significance becomes clear if we consider how repeated events erode savings and assets, which then limit governmental capacity to prepare for subsequent disasters.

These impacts also produce losses through slower processes that ordinary disaster accounting often fails to capture. As identified in Section 3.1, risks like coastal erosion, sea level rise and saltwater intrusion can gradually reduce land value, damage ecosystems and render existing livelihoods less viable. Loss extends beyond property damage among communities which depend upon customary territories, fisheries or local ecological knowledge. Repeated flooding or coastal retreat can disrupt cultural practices, weaken community governance and sever human relationships with land and water bodies: none of which can be financially compensated.

Therefore, the distinction between economic and non-economic losses needs to be foregrounded. The authorities can calculate the cost of rebuilding roads or repairing homes but cannot fully account for the loss of customary territory, burial sites, community networks or ecological knowledge. Indeed, IPCC identifies the loss of cultural heritage, biodiversity, ecosystem services and social values as forms of non-economic loss that are often neglected by conventional damage assessments.³⁶

Tuvalu’s predicament demonstrates what happens when these losses converge. Under worst-case predictions of sea level rise, nearly half of the land area of its capital, Funafuti, could be routinely inundated during normal monthly high tides by 2050-60, and less than 10% may remain above annual high spring tide levels by 2100.³⁷ Here, the stressor itself (rising sea levels) is pushing the country towards the hard limits of in-place habitability. Although similar existential risks do not exist for Malaysia, this stressor is still capable of producing a decline in localised habitability and irreversible land use change in low-lying coastal and estuarine zones.

3.3.2 Socioeconomic vulnerabilities

Loss and damage is most severe when climate change erodes the land and ecosystems upon which communities sustain both their livelihoods and cultures.

The roundtable identified indigenous communities, farmers, small enterprises and marginalised households as groups whose risks remain poorly captured by formal data and financing systems. The same hazard may cause temporary disruptions for well-insured and well-resourced households but permanent cultural or livelihood losses for less-protected communities.

One salient example concerning indigenous communities comes from the Sa'ban community of Long Banga, in the Sarawak interior. Its members face major threats – droughts, wildfires and increasingly unpredictable seasons – while relying on traditional ecological knowledge to guide resource use and adaptation.³⁸ However, less predictable environmental patterns can weaken the practical value and intergenerational transmission of knowledge tied to natural ecosystems and seasonal cycles. Consequently, indigenous communities are at risk of losing customary practices and collective identities, even if tangible financial losses due to damaged land can be compensated.

Elsewhere, small farmers and low-income coastal or riverine households face related dangers, where repeated losses can eliminate the material bases of their livelihoods. Damaged boats, increased water salinity in padi fields and repeatedly flooded homes may result in permanent losses when households cannot finance recovery or generate income through different means. This results in escalating peace and security factors where unequal recovery reinforces regional and social disparities. Communities which suffer from repeated climate-related losses, yet only receive limited protection, may conclude that public institutions value other places and populations more highly. Such perceptions could deepen grievances among already marginalised rural and indigenous communities, by extension weakening trust in federal and state authorities as well as intensifying tensions over land and development priorities.

3.3.3 Governance and political capacity

The roundtable identified weak inter-ministerial coordination, the absence of dedicated preventive financing and poor data on marginalised groups as barriers to equitable recovery.

One key failure in governance is the lack of a clear assignation of responsibility for residual climate losses, despite the existence of supporting and complementary policies such as the National Disaster Risk Reduction Policy 2030.³⁹ Malaysia still manages climate impacts through separate systems for disaster response, adaptation, public finance and social protection. Such fragmentation weakens implementation capacity and prevents institutions from managing climate risk as an interconnected problem.⁴⁰ As a result, repairs to physical damage and the distribution of immediate relief occur without determining who absorbs uninsured losses or accounting for a future in which recovery has become economically and socially unsustainable. These institutional gaps then transfer residual risks to households, small businesses and state governments.

Using the 2021 flood as a case study, insured losses amounted to RM1.5-2 billion against total economic losses of RM5.3-6.5 billion.⁴¹ This represents roughly 20-30% coverage – a high ratio by Malaysian standards – where historically, only around 10% of flood losses were insured. The concentration of insured losses in manufacturing, semiconductor facilities and commercial properties in Kuala Lumpur and Selangor illustrates how formal risk-transfer systems protect commercial assets more effectively than vulnerable households.⁴² Further, Malaysia's limited flood data, fragmented responsibilities and policy uncertainty make it difficult for insurers and financial institutions to price and distribute risk. Consequently, businesses with limited access to financial resources for flood preparedness reported flood-related revenue losses three times greater than businesses without this constraint, while SMEs were 50% likelier than large businesses to report financial damage.⁴³ These figures expose a political choice embedded in the current system. Here, the state responds only after losses occur, while those with the least capacity to respond or recover continue absorbing the largest share of loss and damage burdens.

4.0 Climate-related security risks for complex and interdependent systems

The UN's New Agenda for Peace recognises that climate risks transcend national borders.⁴⁴ They become security risks at the international scale when disruptions spread beyond the economic sectors or location where it physically begins. Malaysia illustrates this dynamic because external climate shocks can rapidly propagate along its highly integrated supply chains, resulting in economic and social vulnerabilities across multiple domestic geographies.⁴⁵ Its economy depends on broader systems whose stability rests on the continuous physical movement of energy, goods, capital and labour, which are sensitive to climate-related disruptions.

This analysis, which uses international supply chains, decarbonisation and trade measures as analytical lenses, departs from the CPS Toolbox because the risks discussed are non-linear. Instead, they emerge through feedback loops between physical hazards, trade dependencies, infrastructural failures and ultimately, policy responses. It draws primarily from the roundtable findings, which highlighted risks, such as supply chain exposure, transition pressures and unequal trade-related costs. Security risks emerge as the cumulative consequences of disruption.

4.1 Supply chains and industrial corridors

Climate change is changing the conditions under which Malaysian supply chains operate. As a trade-dependent economy deriving around 70% of its gross domestic product from exports, Malaysia's prosperity depends not just on competitive markets but also the uninterrupted movement of goods through regional and global supply chains.

Consequently, climate disruptions threaten economic stability by interrupting production, increasing prices, reducing employment opportunities and ultimately, placing greater pressure on the state's capacity to protect livelihoods and maintain economic resilience. Malaysia's integration into regional markets also means that domestic disruptions elsewhere in Southeast Asia and Asia at large are not contained within national borders. Instead, they travel outwards through supply chains, meaning that foreign climate and regulatory shocks are transmitted domestically, and vice versa.

Malaysia's manufacturing sector represents the clearest source of systemic exposure. Electronics and electrical products account for about 40% of national exports, with Malaysia located at the centre of the global semiconductor value chain. Although chip fabrication occurs elsewhere, Malaysia performs critical assembly, testing and packaging functions, connecting producers in Taiwan with manufacturers and consumers in other advanced economies like the US. The 2021 flood exposed how dependent this system had become on Malaysian industrial corridors. Flooding around Port Klang disrupted transport links and manufacturing operations, severing a critical packaging and testing node from its supply chain.⁴⁶ A seemingly domestic disruption intensified the already constrained and vulnerable global chip supply, contributing to the suspension of production across the American automotive industry.⁴⁷

Critically, flood-related vulnerabilities are still evident today, as experienced by industrial facilities in Johor, Sabah and Sarawak through 2025.⁴⁸ Such climate-related disruptions are a recurring feature of Malaysia's industrial landscape and observe a distinct pattern. They first damage factories and industrial assets directly and then interrupt the infrastructure upon which production depends, including electricity, the water supply, transport and logistics. Even if factories remain intact, this second disruption determines whether production can continue. As the roundtable found, supply chain resilience depends on institutional coordination as much as it does on physical infrastructure. Participants identified fragmented governance as the main constraint to anticipating and managing cascading economic risks.

This pattern has important security implications. Repeated disruptions reduce industrial output, weaken employment and constrain government, at a time when households and businesses require greater state support. As a result, climate risks extend beyond business continuity but also test the state's general ability to stabilise the economy, sustain public confidence and manage the unequal distribution of economic losses. Malaysia's industrial corridors should, therefore, be understood as strategic infrastructure whose resilience amid climate change strengthens both national and regional security.

4.2 Economic security and the energy transition

As Malaysia actively decarbonises, a major transition risk is the absence of a governance framework that distributes costs fairly. IPCC defines a just transition as a set of principles and practices designed to ensure that “no people, workers, places,

sectors, countries or regions” are left behind in the shift from a high-carbon to a low-carbon economy. Where this condition goes unmet, the transition itself becomes a source of structural insecurity.⁴⁹

For Malaysia, managing the pressures of decarbonisation and fiscal reform requires significant attention. One vulnerability is the distribution of transition costs across sectors and communities that lack institutional buffers. Presently, federal revenue remains significantly tied to petroleum receipts from government-linked oil and gas companies.⁵⁰ In 2025, the power sector relied on coal for about 43-45% of generation needs, with full retirement deferred to 2044 under NETR.⁵¹ Roundtable stakeholders identified a consistent pattern in which short-term economic priorities or immediate economic returns override long-term climate resilience and security considerations in national planning. Consequently, the deferral of fossil fuel retirement is prioritised, narrowing Malaysia’s window for a managed and equitable transition with each successive budget cycle. However, delays create a different form of insecurity by increasing exposure to stranded assets, carbon-related trade measures and declining industrial competitiveness.

Meanwhile, fragmented governance leaves transition planning disconnected from financing, labour policies and regional development. As a result, communities with the weakest institutional protections risk absorbing the costs of transition by default, rather than the costs being managed through deliberate public policy. Rooftop solar and electric vehicle incentives, for example, are more accessible to higher-income households with property, savings and credit, while lower-income households may see few immediate benefits of adoption. Workers and communities dependent on fossil fuel industries could also face job and income losses without sufficient reskilling, social protection and economic diversification. Hence, the security risk lies in how well the transition is governed. A poorly managed transition can reinforce regional inequalities and erode confidence in public institutions, even as Malaysia advances its decarbonisation goals. Conversely, a transition that invests in vulnerable communities and coordinates economic reform across government can strengthen both economic resilience and regional stability.

4.3 Climate-linked trade measures

Climate ambitions and restrictions from abroad, if imposed upon trading partners, generate economic insecurity domestically. For many developing states, including Malaysia, the challenge lies in the cost of complying with new standards, which distributes effects unevenly across the economy. Increased trade openness can reduce the impact of climate shocks by allowing commodities to move from regions with surpluses to deficits, particularly during disruptions. But where regulatory barriers constrain market access, both the mitigation of shocks and the burdens of adjustment fall unevenly on the least capable actors.⁵²

Take for example the EU’s Deforestation Regulation – one of its climate-linked trade measures – which requires full supply chain traceability to the plantation level

for palm oil, rubber and timber products entering the bloc. Malaysia is classified as a “standard risk” despite seeing a 65% reduction in primary forest loss in 2014–23.⁵³ The burden of compliance falls most heavily on nearly 500,000 smallholders who produce 40% of national palm oil output but lack the technical and financial resources to map their plots and provide the required geolocation and traceability data compared with larger corporations. For smallholder communities in Sabah, Sarawak, Kelantan and Kedah, exclusion from EU markets compounds pre-existing vulnerabilities.

This uneven distribution of adjustment costs carries wider implications for climate security. Where regulatory barriers restrict market access, they also reduce the capacity of smaller producers to benefit from international trade. The roundtable identified transition finance and institutional support as critical gaps in Malaysia’s climate governance frameworks. Roundtable participants argued that smallholders and SMEs cannot be expected to meet increasingly stringent climate standards without coordinated technical assistance, accessible financing and clearer policy directions from the government. Therefore, the security challenge lies in whether Malaysia is preventing external climate policies from transferring disproportionate adjustment costs onto vulnerable communities.

5.0 Policy recommendations

These recommendations aim to prepare Malaysia to operationalise a CPS framework. In addition to (1) recognising climate change as a non-traditional security threat, Malaysia must also (2) develop the institutional capacity to identify how environmental stressors interact with inequality, displacement, livelihood insecurity and governance weaknesses, and (3) intervene before these pressures escalate into social tension, institutional distrust or regional instability.

5.1 Anchoring climate change within a non-traditional security framework

Malaysia’s governance response to climate security remains fragmented across agencies. A unified mandate remains absent, with no statutory obligation to treat climate change as a national security concern. MKN should formally designate climate change as a non-traditional security priority within its strategic framework, in tandem with the establishment of a dedicated inter-ministerial climate security council, which can be modelled on the United Kingdom’s Climate Security Taskforce or Australia’s National Emergency Management Agency.⁵⁴ Separately, the incoming Climate Change Bill should include an explicit climate security mandate binding all federal agencies to a common risk assessment framework, and be tabled without further deferral. Consequently, the full extent of climate impacts on national security and the mandate of the climate security council can be fully understood.

Alongside institutional reform, the evidence base for climate security planning should be strengthened. Malaysia's small research ecosystem and data accessibility challenges – two concerns consistently raised during the roundtable – mean that governance reforms risk being poorly calibrated without better modelling capacity. NRES and research institutions, such as Akademi Sains Malaysia or Universiti Kebangsaan Malaysia's Institute of Climate Change, should establish a national climate risk modelling unit, with dedicated funding for the subnational disaggregation of climate security data by state, economic sector and vulnerable group. This can be modelled on the Philippines' Climate Change Commission, which offers a regional example of a cabinet-level body with its own statutory technical research unit.⁵⁵

5.2 Strengthening protections for the most vulnerable

The communities bearing the heaviest climate burdens are also among the least represented in governance. Although climate change adaptation resources have been allocated, existing policy frameworks have yet to address this distributional gap. An integrated system capable of identifying where climate-induced impacts overlap with poverty, displacement or unresolved grievances remains lacking.

Here, NRES and relevant ministries can only progress once a climate vulnerability mapping protocol – disaggregated by sex, age, legal status and income level – is developed. This protocol can be modelled on the traditional knowledge integration model piloted by the UN Development Programme's community-based adaptation programme in Bangladesh.⁵⁶ By doing so, adaptation financing can reach the most exposed communities.

For indigenous communities, nature-based solutions and indigenous traditional ecological knowledge should be formally integrated as instruments of the National Adaptation Plan. Sabah and Sarawak's autonomy over forest governance makes them natural sites for piloting community-based early warning systems and ecosystem-based flood mitigation efforts: measures which the roundtable participants identified as underleveraged security assets.

5.3 Treating low-carbon transition as a peace and economic security challenge

Malaysia lacks a comprehensive framework for anticipating how decarbonisation redistributes employment, revenue, energy costs and development opportunities across economic sectors and states. Peace and stability depend significantly on how such structural economic change is governed. Transition planning should, therefore, be integrated into national development and fiscal policies to ensure that climate is not treated as a standalone problem. After all, a poorly managed transition could result in job losses, reduced local revenue, higher household costs and resistance among communities who feel that they are bearing the costs of national climate policy. Further, a delayed transition results in other insecurities, as discussed in Subsection 4.2.

Ministries should undertake regional and sectoral transition security assessments to identify gaps in NETR, which lacks key safeguards. Assessments should specifically identify the workers, communities, industries and sources of state revenue exposed to the negative impacts of decarbonisation, including the retirement of coal power plants, subsidy reforms and carbon-intensive sectoral restructuring. They should also examine how these effects overlap with existing poverty, infrastructure gaps and regional inequality.

5.4 Framing climate displacement as a peace, protection and governance issue

Malaysia's disaster preparedness arrangements are poorly suited for displacement extending beyond temporary evacuations. This shortcoming requires urgent resolution, considering how climate change is likely to lead to repeated internal movement, loss of habitable land and increased pressure for relocation planning.

Malaysia could adopt a national framework for climate-related displacement and planned relocations, which establishes key standards like prior consultation, compensation, housing, livelihood restoration, continued access to education and healthcare, documentation and the protection of customary rights while assessing host communities' capacities to prevent subsequent competition for resources. The framework's objective should be preventing temporary climate-induced emergencies from hardening into prolonged exclusion by treating displaced people as rights-holders requiring protection. Independent bodies, such as the Human Rights Commission of Malaysia (Suhakam), could monitor whether or not relocation decisions meet basic human rights and non-discrimination standards.

Here, mobility arrangements can define procedures and responsibilities before crisis-driven displacement occurs. Domestically, Malaysia should begin by establishing standards for relocation across districts and states. Regionally, it should promote arrangements for temporary entry, documentation, access to essential services and voluntary return following major climate disasters across ASEAN, thus reducing the likelihood that unmanaged cross-border movements produce humanitarian exclusions or diplomatic tensions. Here, the Australia-Tuvalu Falepili Union illustrates the value of proactively planning mobility, since it establishes a special mobility pathway for Tuvaluan citizens alongside commitments to provide climate adaptation and disaster assistance. Neither Malaysia nor ASEAN are required to reproduce this treaty but there are transferable lessons available.

5.5 Instituting ASEAN climate-security agenda

As apparent from the roundtable discussion, a broader conversation on systemic integration should consider ASEAN's leading role. However, ASEAN currently lacks a consolidated mechanism to assess how climate pressures may affect displacement, food security, social stability and interstate relations across the shared ecosystems of its member states, despite its institutional capacity for disaster response and environmental cooperation.

Malaysia should, therefore, push for an ASEAN CPS assessment covering shared regional risks. Specifically, this assessment should consider how climate impacts in one member state spill across borders into others and how established national responses, such as export restrictions or tighter border controls, can intensify regional instability. Looking ahead, both ASEAN and Malaysia could champion nature-based solutions and bridge policy with practice to achieve lasting climate resilience.

The ASEAN Coordinating Centre for Humanitarian Assistance on disaster management and the wider disaster management framework already provide a working operational basis for humanitarian coordination. Therefore, Malaysia should push to extend its existing mandate to incorporate anticipatory planning. By folding climate projections, supply chain data, displacement scenarios and vulnerability indicators into existing machinery, ASEAN can institute preparedness frameworks to anticipate and prepare for potential climate risks.

Endnotes

¹ Adger, W. N., et al. (2014). Human security. In C. B. Field et al. (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 755–791). Cambridge University Press. <https://www.ipcc.ch/report/ar5/wg2/human-security/>

² H.-O. Pörtner et al. (Eds.), *Climate change 2022: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. <https://doi.org/10.1017/9781009325844.012>

³ Bernama. (2024, April 14). 45 cases of heat-related illnesses, two deaths recorded to date. *The Star*. <https://www.thestar.com.my/news/nation/2024/04/14/45-cases-of-heat-related-illnesses-two-deaths-recorded-to-date>

⁴ *Borneo Post*. (2026). Too hot to ignore: Malaysia's quiet heat health crisis. <https://www.theborneopost.com/2026/03/30/too-hot-to-ignore-malysias-quiet-heat-health-crisis/>

⁵ National Water Research Institute of Malaysia. (n.d.). *Malaysia Adaptation Index (MAIN)*. <https://main.nahrim.gov.my/>

⁶ Hijioka, Y., et al. (2022). Asia. In H.-O. Pörtner et al. (Eds.), *Climate change 2022* (pp. 1457–1579). Cambridge University Press.

⁷ Notre Dame Global Adaptation Initiative. (2026). *ND-GAIN Country Index*. University of Notre Dame.

⁸ Hijioka et al. (2022).

⁹ Water is not solely a state matter. A 2005 constitutional amendment moved “water supply and services” from the State List to the Concurrent List of the Ninth Schedule, thus giving the federal government a regulatory role over the water services industry. This was later formalised through the National Water Services Commission Act 2006. However, rivers, catchments and raw water resources remain primarily under state jurisdiction. This split adds a further layer of complexity, since federal and state authorities must coordinate over water’s treatment, distribution and pricing even as upstream land and river management remain state-controlled.

¹⁰ World Bank. (2026, March 3). *Balancing innovation and coordination: Institutional solutions for effective climate action in Malaysia's Borneo states* (Malaysia Subnational Climate Change Institutional Assessment). <https://www.worldbank.org/en/country/malaysia/publication/balancing-innovation-and-coordination-institutional-solutions-for-effective-climate-action-in-malaysia-s-borneo-states>

¹¹ Birchall, J., Bonnett, N., & Kehler, S. (2022). The influence of governance structure on local resilience: Enabling and constraining factors for climate change adaptation in practice. *Urban Climate*, 47. <https://doi.org/10.1016/j.uclim.2022.101348>

¹² Abdelhak, S., Sulaiman, J., & Mohd, S. (2012). Poverty among rural communities in Kelantan and Terengganu: The role of institutions, farmers' risk management and coping strategies. *Journal of Applied Sciences*, 12(2), 125–135.

¹³ DOSM. (2025). *Poverty in Malaysia, 2024*. Economy Ministry.

¹⁴ UN. (2021). *Toolbox: Conceptual Approach | Climate Security Mechanism*. <https://www.un.org/climatesecuritymechanism/en/media/38>

¹⁵ Ibid.

¹⁶ Singer, L. (2020). *Climate-induced migration: A threat to peace and security? A regional analysis of the West African Sahel* (Master's thesis, University of Seville). <https://repository.gchumanrights.org/server/api/core/bitstreams/207decddc-da8b-46e7-b1e1-d7b4cf734266/content>

- ¹⁷ UNICEF Malaysia, Universiti Kebangsaan Malaysia, & Universiti Malaysia Sabah. (2021). *Impact of climate change on children: A Malaysian perspective*. UNICEF Malaysia. <https://www.unicef.org/malaysia/reports/impact-climate-change-children>
- ¹⁸ Rosmadi, H. S., et al. (2023). Current and potential impacts of sea level rise in the coastal areas of Malaysia. *IOP Conference Series: Earth and Environmental Science*, 228(1), Art. 012023. <https://doi.org/10.1088/1755-1315/228/1/012023>
- ¹⁹ Wang, Q., et al. (2025). Quantifying salinity and drought drive forces on paddy field loss in the Mekong Delta, Vietnam. *Communications Earth & Environment*, 6, Art. 503. <https://doi.org/10.1038/s43247-025-02490-z>; and UNDP. (2024). *A food fight against climate and costs*. <https://www.undp.org/malaysia/blog/food-fight-against-climate-and-costs>
- ²⁰ World Bank. (2025). *World Bank supports efforts to strengthen community resilience for 18 million households in the Philippines* [press release]. <https://www.worldbank.org/en/news/press-release/2025/07/31/wb-supports-efforts-to-strengthen-community-resilience-for-18-million-households-in-ph>
- ²¹ UNICEF Malaysia. (2023) *Weather-related disasters led to 43.1 million displacements of children over six years*, <https://www.unicef.org/malaysia/press-releases/weather-related-disasters-led-431-million-displacements-children-over-six-years>
- ²² Al Mamun, A., et al. (2025). Perceived flood risk severity and response efficacy affect migration intentions in flood-prone regions of Klang Valley in Malaysia. *Communications Earth & Environment*, 6, Article 597. <https://doi.org/10.1038/s43247-025-02602-9>
- ²³ Discover Sumatra. (2026). *Flood in Sumatra 2025 – Everything you need to know*. <https://www.discover-sumatra.com/flood-in-sumatra-2025/>
- ²⁴ Jamalludin, F. H. B., et al. (2025). Waterborne diseases in flood compromised WASH conditions in Malaysia: A planetary health perspective. *Frontiers in Climate*, 7, Art. 1646753. <https://doi.org/10.3389/fclim.2025.1646753>
- ²⁵ Plan International. (2025, December 1). *Indonesia launches emergency response as devastating floods claim over 1,000 lives*. <https://plan-international.org/news/2025/12/01/indonesia-launches-emergency-response-as-devastating-floods-claim-over-1000-lives/>
- ²⁶ Radzuan, M. D. A., & Abdul Latib, M. F. (2025). Identifying operational management practices in temporary evacuation centres (PPS) for flood victims in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 15(7), 257–269. <https://doi.org/10.6007/IJARBSS/v15-i7/25700>
- ²⁷ World Bank. (2023). *Women's and girls' vulnerability to gender-based violence in the aftermath of disasters*. <https://reliefweb.int/report/world/womens-and-girls-vulnerability-gender-based-violence-aftermath-disasters>
- ²⁸ Center for Disaster Philanthropy. (2025, January 23). *2024 Southeast Asia floods*. <https://disasterphilanthropy.org/disasters/2024-southeast-asia-floods/>
- ²⁹ Mahaseth, H. (2024). *Climate Change in ASEAN: Challenges, Initiatives, and the Road Ahead*. Modern Diplomacy. <https://moderndiplomacy.eu/2024/10/21/climate-change-in-asean-challenges-initiatives-and-the-road-ahead/>
- ³⁰ Ameruddin, N. F. L., Berezina, E., & Yap, C. C. (2025). Exploring predictors of psychological preparedness for flood victims: A conceptual framework for Malaysia. *F1000Research*, 14, 195. <https://doi.org/10.12688/f1000research.160231.3>

- ³¹ UNDP. (2023). *Malaysia*. UNDP Climate Promise. <https://climatepromise.undp.org/what-we-do/where-we-work/malaysia>
- ³² NRES. (2025, November 20). *Malaysia Steers ASEAN's Climate Agenda Into Week Two Of Cop30, Translating Aspirations Into Action*. PRNewswire. <https://www.prnewswire.com/news-releases/malaysia-steers-aseans-climate-agenda-into-week-two-of-cop30-translating-aspirations-into-action-302622556.html>
- ³³ IPCC. (2021). *Climate Change 2021 Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf
- ³⁴ weADAPT. (2024). *Non-Economic Loss and Damage (NELD): policy gaps and recommendations*. <https://weadapt.org/knowledge-base/vulnerability/non-economic-loss-and-damage-policy-brief/>
- ³⁵ DOSM. (2025). *Special Report on Impact of Floods in Malaysia 2024*. https://www.dosm.gov.my/uploads/release-content/file_20250319122430.pdf
- ³⁶ Ara Begum, R., et al. (2022). Point of Departure and Key Concepts. In H.-O. Pörtner et al. (Eds.), *Climate change 2022* (pp. 121–196). Cambridge University Press.
- ³⁷ UNDP. (2025, August 18). *Tuvalu convenes high-level donor roundtable to accelerate climate adaptation amid rising sea threats*. UNDP Pacific. <https://www.undp.org/pacific/press-releases/tuvalu-convenes-high-level-donor-roundtable-accelerate-climate-adaptation-amid-rising-sea-threats>
- ³⁸ Hosen, N., Nakamura, H., & Hamzah, A. (2019). Using Traditional Ecological Knowledge to Adapt to Climate Change in Interior Sarawak. *Environment-Behaviour Proceedings Journal*, 4(11), 185. <https://doi.org/10.21834/e-bpj.v4i11.1716>
- ³⁹ Nadma. (2024). *National Disaster Risk Reduction Policy 2030 for a safer Malaysia*. <https://www.nadma.gov.my/bi/media-en/news/1359-nadma-national-disaster-risk-reduction-policy-2030-for-a-safer-malaysia>
- ⁴⁰ Organisation for Economic Co-operation and Development (OECD). (2024). *OECD Economic Surveys: Malaysia 2024*. OECD Publishing. <https://doi.org/10.1787/e45ca31a-en>
- ⁴¹ DOSM. (2022, January 28). *Special Report on Impact of Floods in Malaysia 2021*. <https://www.dosm.gov.my/portal-main/release-content/special-report-on-impact-of-floods-in-malaysia-2021>
- ⁴² Malaysian Reinsurance Berhad & Faber Consulting AG. (2022). *Malaysian Insurance Highlights 2021*. Malaysian Reinsurance Berhad. https://www.malaysian-re.com.my/api/uploads/MIH_22_final_a6da7cf755.pdf
- ⁴³ World Bank, & Bank Negara Malaysia. (2024). *Managing flood risks: Leveraging finance for business resilience in Malaysia*. World Bank.
- ⁴⁴ UN. (2023). *A New Agenda for Peace*. <https://www.un.org/sites/un2.un.org/files/our-common-agenda-policy-brief-new-agenda-for-peace-en.pdf>
- ⁴⁵ Araujo, B., Linardi, S., & Vissotto, S. (2025). *Supply chain transmission of climate-related physical risks* (BIS Working Paper No. 1260). Bank for International Settlements. <https://www.bis.org/publ/work1260.pdf>
- ⁴⁶ Lim, J. (2021). *Malaysian floods disrupts semiconductor supply chain; devastates workers*. In Tech Wire Asia. <https://techwireasia.com/2021/12/malaysian-floods-devastate-workers-disrupts-semiconductor-supply-chain/>
- ⁴⁷ Prevention Web. (n.d.). *How climate change is disrupting the global supply chain*. Retrieved July 24, 2026, from <https://www.preventionweb.net/news/how-climate-change-disrupting-global-supply-chain>

⁴⁸ Selan, S. (2026). *Malaysia's flood losses ease 32 per cent in 2025, but with higher infrastructure damage*. In Eco-Business. <https://www.eco-business.com/news/malysias-flood-losses-ease-32-per-cent-in-2025-but-with-higher-infrastructure-damage/>

⁴⁹ Pathak, M., et al. (Eds.). (2022). Technical Summary. In P.R. Shukla et al. (Eds.). *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. <https://doi.org/10.1017/9781009157926.002>

⁵⁰ Finance Ministry (Malaysia). (2024). *Fiscal Outlook and Federal Government Revenue Estimates 2025*. Putrajaya. <https://www.mof.gov.my/portal/en/resources/treasury-publications/fiscal-outlook/fiscal-outlook-2025>

⁵¹ Ember (2024), *Solar and grid flexibility critical for Malaysia's future electricity affordability and security*, <https://ember-energy.org/latest-insights/solar-and-grid-flexibility-critical-for-malaysia/>

⁵² Zimmermann, A., et al. (2018). *Trade, food security and climate change: conceptual linkages and policy implications* (background paper for The State of Agricultural Commodity Markets [SOCO] 2018.) Rome: Food and Agriculture Organization of the UN. <https://openknowledge.fao.org/server/api/core/bitstreams/d6c8af41-565b-4292-a731-8000574476de/content>

⁵³ European Commission. (2023). *Regulation on Deforestation-free Products*. https://environment.ec.europa.eu/topics/forests/deforestation/regulation-deforestation-free-products_en

⁵⁴ UK Government. (2026, June 26). *UK launches first ever taskforce to strengthen climate security*. GOV. UK. <https://www.gov.uk/government/news/uk-launches-first-ever-taskforce-to-strengthen-climate-security>

⁵⁵ Climate Change Commission, Republic of the Philippines. (n.d.). *About the Climate Change Commission*. <https://climate.gov.ph>

⁵⁶ UNDP. (2023). *Community-led initiative in climate resilience: lessons from Bangladesh*. <https://www.undp.org/bangladesh/blog/community-led-initiative-climate-resilience-lessons-bangladesh>



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