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ECOLOGICAL RISK IN A FUTURE SOUTHEAST ASIA

AN ECOLOGICAL SECURITY POLICY GAME

Robert Bentley, Lily Boland, Michael R. Zarfos, and Andrea Rezzonico

Edited by Erin Sikorsky and Francesco Femia
Ecological Risk in a Future Southeast Asia: An Ecological Security Policy Game

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Cover photo: A satellite-based composition showing shifting cultivation in Laos over three decades. Areas are colored based on when the land was first cleared for the agricultural practice, with yellows and oranges representing earlier years in the study period and shades of purple indicating later. (NASA Earth Observatory image by Lauren Dauphin, using data from Chen, Shijuan, et al., 2023.)

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This report is part of the Ecological Security Program of the Council on Strategic Risks (CSR). The goal of CSR’s Ecological Security Program is to understand and address the security implications of global ecological disruption. Global ecological disruption is already underway: the biosphere is rapidly destabilizing; many ecosystems are shifting to new baselines; ecological benefits to people are degrading; and new ecological harms are emerging.

These ecological stresses add pressure on people, communities, institutions, governments, and norms that have not evolved to adequately match the changing threat landscape. Without substantial and transformative mitigation policies, dangerous fallout is increasingly likely.

Adverse security outcomes are likely to follow. Some security implications include: direct harm to people, political instability, geopolitical clashes, human insecurity, intensified violence and crime, and altered patterns of disease.
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A satellite–based composition showing shifting cultivation in Laos over three decades. Areas are colored based on when the land was first cleared for the agricultural practice, with yellows and oranges representing earlier years in the study period and shades of purple indicating later.

Executive Summary

This scenario exercise explored how security risks may be heightened by ecological degradation due to anthropogenic stressors. The scenario was set in a fictional country, Khomland, with a number of geographic, social, economic, and political features characteristic of actual Southeast Asian states. During the game, three teams representing domestic civil society, the international community, and the governing elite, faced three stages of deteriorating ecological conditions. Teams were given the opportunity to respond directly to these ecological changes and to interact with one another. The game was structured to facilitate negotiations between various actors and to explore emerging conflicts among teams, illuminating the evolution of player decision-making and how those decisions may interact with a pressing ecological crisis.

Key takeaways from the exercise include:

- **Human-driven ecological disruption initiated a domestic security crisis.** Mismanagement of Khom’s ecosystems and external pressures from climate change, led to the collapse of fisheries and coastal agriculture—the resulting food and job insecurity prompted large scale migration into cities.

- **Climate change and other forms of ecological degradation catalyzed internal conflict.** Increasingly intense episodes of precipitation combined with upland deforestation made much of the country’s population centers and agricultural lands vulnerable to severe flooding. At the same time, extreme wet bulb temperatures proved fatal. These extreme events led to a spiraling conflict of extreme actions and responses.

- **Society was not able to cope with the opening ecological crisis or its evolution.** Players accepted the fate of Khom’s ecosystems and made pivots from actions intended to restore ecosystem services and solve the crisis toward ones intended only to manage it.
Ecological mitigation, not restoration, was a more achievable goal given the lack of adaptation measures in place.

- **It would have been more efficient and effective to avoid ecological degradation than it was to restore ecosystems.** Ecosystem restoration takes years of community cooperation, funding, and a commitment to monitoring and upkeep. These capacities were largely absent from a society experiencing an internal security and political crisis.

- **Player decisions often exacerbated rather than resolved the ecological crisis.** The ecological situation forcibly shaped player decisions. Although play began with specific stressors and tipping points, followed by human action, this sequence was often obfuscated. As play progressed it became more difficult to distinguish between when human actions drove the ecological situation and when the ecological situation drove humans to act. Factional politics and unrest, catalyzed by job losses, food insecurity, and migration, largely distracted players from opportunities to restore ecosystems. Instead, ecological degradation was allowed to continue. This feedback loop between ecological degradation and insecurity and unrest only exacerbated the political crisis.

- **Competing actions driven by socio-economic and political aims also contributed to ecological disruption.** International funds reached the pockets of elites instead of the ecosystems that desperately needed attention. Civil disobedience in response to corruption resulted in the death of thousands and created a hotspot for disease spillover. Disruptive agricultural practices also continued as people migrated from cities to rural areas in search of better livelihoods threatened by both the country’s security services and the crisis.

- **Rather than join forces to address the immediate impacts of ecological degradation, actors turned on one another.** The government militarized its response to both the crisis and opposition from domestic political groups and civil society. As domestic actors turned against one another and vied for power, the international
community became less incentivized to seek out financial support. Providing humanitarian aid became too precarious for risk-averse international nongovernmental organizations (NGOs).

- **The political system turned from semi-democratic to a concentrated authoritarian state.** The ruling elites amassed more power as the country’s situation worsened, in the name of preserving state stability. Ultimately, the crisis led to the end of the existing semi-democratic political system and the establishment of a more authoritarian state.

The results of this exercise show that loss of ecosystem functions and services, and the acceleration of climate change, may contribute to resource scarcity, food insecurity, economic fragility, community displacement, societal unrest, political instability, civil conflict and increased authoritarianism. Since this scenario exercise explicitly eschewed involvement of external powers, such a possibility cannot be ruled out. The scenario demonstrated that where social imperatives meet ecological degradation, the resultant cascade of risk pathways will be unpredictable and hazardous.

This report concludes with a series of recommendations inspired by participant discussions. Some of these include:

- **Fund research, education programs, and scenario exercises focused on translating the security risks posed by ecological degradation and collapse.** Governments and IGOs—particularly their security agencies—need data, resources, and expertise to begin to understand and successfully mitigate the complexities of ecological security issues. The private sector can fiscally support these initiatives.

- **Direct early and upstream investments in governance and stability to ensure local organizations and state entities have the foundation to respond to complex crises when they emerge.** This preparation prevents catastrophic impacts from completely overwhelming government capacities.
• Prioritize conservation and disincentivize environmental damage from the outset - it is easier to prevent ecological disruption than it is to respond to it. Governments and intergovernmental organizations (IGOs) must address this initiative in partnership with local civil society organizations (CSOs) and the private sector to ensure communities are considered, supported, and involved in these efforts. Communicating the economic value provided by these integral ecosystem services will help reluctant actors recognize their benefits and the costs of their degradation and loss.

• Increase aid for, and investment in, adaptation and resilience. Local communities, CSOs, and governments need support to adapt to ecological degradation and build more resilient societies. Nature-based solutions (e.g. restoration of upland forests, wetlands, and mangroves to protect against flooding) are an essential part of this approach.

• Build the capacity to quickly deploy hybrid responses to ecological emergencies. There is a clear need to augment global institutional capabilities to be able to deliver complex humanitarian, developmental, reparative, and structural responses during complex ecological crises. IGOs should prepare to respond to issues such as mass displacement and food insecurity, and governments should consider more flexible policies for absorbing and hosting displaced peoples. At the same time, organizations must be able to rapidly deploy solutions aimed at strengthening communities through climate adaptation and ecosystem restoration.

• Invest in and deploy technology to make agriculture more resilient and regenerative; Subsidize and promote agricultural practices that rebuild and protect ecosystem function, biodiversity, and reduce emissions while maintaining yields.

• Combat or circumvent corrupt networks and actors. Corruption thwarts the efficacy of external aid, investment, and influence campaigns. This can be mitigated through improved transparency by proactive governments and direct support for civil society from the international community.
A February 2018 satellite image captures the newly formed reservoir along the Srepok River created by the completion of the Lower Sesan II dam in Stung Treng province, Cambodia.

Source: Joshua Stevens / NASA Earth Observatory; data from Landsat and USGS.
Introduction

The intertwining effects of climate change and ecological disruption are poised to introduce new patterns of disturbance and amplify instability for people and societies worldwide, straining and sometimes overwhelming countries’ response capacities and challenging international security. Policy efforts to understand and mitigate these multifaceted and complex crises are oftentimes characterized by a poor understanding of converging risks and low prioritization of ecological issues. To begin addressing this growing nexus, the Council on Strategic Risks (CSR) hosted an exercise scenario rooted in an ecological crisis for a group of multidisciplinary experts.

During the two-day workshop, players were thrust into a simulated future in which large-scale ecological disruption precipitated societal chaos and eroded humanitarian conditions in a fictional Southeast Asian country. The scenario exercise, set in 2040, served several purposes: 1) familiarizing current and future decision makers, responders, and leaders for the types of ecological breakdowns they may well have to navigate in the years and decades ahead and 2) immersing and exposing participants to the distress of being unprepared for systemic vulnerabilities.

The results, outlined in this report, include key takeaways from player decisions as well as high-level recommendations that can be used to begin to frame these existential threats. CSR’s ultimate aim is to encourage policies that can adequately mitigate ecological disruption and strengthen cooperative efforts to address ecological security.
Method Background: Principles of Scenarios

Scenario planning is both a practice and a process within the discipline of futures thinking, known more broadly as strategic foresight. From their use in crisis management planning to detailed educational and analytic wargames, scenarios are informed narratives which simulate hypothetical futures. Scenarios are intended to inspire new and variable perspectives on past, current, and future developments.

A policy scenario or game is a drastically simplified model of a real-world situation, in which the players interact with each other and the elements of the simulated reality, usually taking the form of a detailed, “what-if” scenario. The players must respond to a scenario usually characterized by incomplete information, uncertainty regarding the outcome, other players with competing or contrasting interests, with limited resources, and difficult time constraints. Policy scenarios can thus capture many of the human dynamics at play in a real-world situation, where actors usually have only an incomplete picture, face real time and resource constraints, must coordinate their policies within their own group or organization, and must deal with other groups or organizations.

Scenarios can be used to test policy ideas and initiatives, illustrate “what-if” questions about possible futures, and educate participants on how to navigate the challenges of complex situations. They are open-ended, in that the outcomes are not predetermined, and they are free-play, in that the participants are free to devise their moves in any way that meets basic tests of human and scientific plausibility. The outcomes are the product of the interactions among all the participants within and between their groups, allowing policy games to simulate the complexity and unpredictability of the real world.
Road to Developing the Scenario

The Problem

Every policy game begins with a problem or question the game is intended to address. The core issue in question for this game was how would states in a particular region (Southeast Asia) respond to the possible future stresses of widespread ecosystem loss. Southeast Asia faces serious challenges as over-exploitation damages natural resources such as fisheries, tropical reefs, and forests. In addition to the human-driven ecosystem losses, the region faces increasing climate-induced stresses, such as extreme heat events, reduced rice production, and rising sea levels.

Over the coming decades, these problems are likely to significantly worsen, imposing severe, even extreme, stresses on societies in the region. Thus, it was decided that an open-ended, free-play policy game would be the most suitable method to explore how such stresses would test these societies’ ability to cope.

The Scenario

For the scenario, the project began by creating a fictitious semi-democratic country, Khomland, with general geographic, social, economic, and political features characteristic of real Southeast Asian states. Using a fictional country avoided the appearance that any current state was being singled out, and allowed for a hybrid entity that included important features to be addressed in the game, such as a heavy reliance on both fisheries and rice production for food.

The scenario was set in the decade 2040-2050, and initial hypotheses suggested that efforts to limit ecosystem loss and climate change will prove inadequate and by that time the combined effects will be quite serious. The scenario postulated that the fictitious country would be facing these consequences with a political-economic system that similarly reflected a hybrid of Southeast Asian regimes—a ruling elite that used its control over the political and economic system to limit and marginalize opposition. Some scope for civil society,
opposition activism, and independent media were included in a somewhat corrupt and semi-authoritarian “managed democracy,” in which elections take place but the ruling party always wins. The scenario opened with this society facing a rapidly escalating food crisis as fisheries crashed, rice production fell, and rural livelihoods were imperiled.

The Teams

The game was designed to broadly model the interaction of basic social forces in a situation of extreme stress, with a focus primarily on domestic actors. Careful consideration was given to include an international element while ensuring that major powers, particularly the United States or China, did not dominate the play. One team was arranged to comprise the fictional Khomland government/establishment elements, to reflect the “pro-status quo” forces in the society. A second team represented domestic civil society and opposition elements, to reflect “pro-change, anti-status quo” forces. The third team comprised international NGOs and financial institutions, as a potential source of assistance for coping with the crises but with less stake in the outcomes and only a limited ability to influence the domestic forces.
**Game Purpose**

The scenario exercise’s aim was to enhance capacities for thinking through the policy implications of serious ecological degradation, loss of ecosystem services, tipping points, and the collapse of natural and managed ecosystems. Another core element considered is how societies might cope with these real-world possibilities. Three guiding questions identified during the initial phase of designing the scenario helped to shape the scenario’s development and focus its purpose:

**What should governments and societies be doing today to prepare for potential adverse impacts of these ecological disruptions? How can governments and societies be more resilient?**

In the scenario, participants navigated an environment increasingly shaped by the collapse of natural and managed ecosystems (e.g., forests, fisheries, agriculture). The three teams (government/security, international organizations, and domestic civil society) were structured to foster a variety of perspectives on how governments, private sector actors, and non-governmental organizations could enhance the resilience of their fictional society, help local communities protect and restore degraded ecosystems, and enable adaptation efforts to irreversible changes.

**What interactions or dynamics appear to facilitate or hinder adaptation and resilience efforts in the face of severe ecological stress?**

Introducing ecological degradation as a shaping factor helped identify mechanisms for addressing such crises—whether through positively adaptive reactions, resistance efforts, innovative solutions, or even counterproductive behaviors. The game was structured to facilitate challenging negotiations between various actors and explore emerging conflicts among teams, illuminating the evolution of player decision-making and how those decisions interact with the pressing ecological crisis.
Simulating real-world ecological crises created a space for expert participants to zoom out of the fictitious scenario and formulate real-world recommendations in a more innovative setting. This concept was embedded into the game’s setup: moves began with detailed worksheets that forced players to clearly articulate their goals and actions, followed by rounds of negotiations to foster cooperation or conflict, and finally plenary sessions that expanded into a collaborative space for producing unique ideas informed by the scenario’s dynamics.

**Bottom Line**

Ecological degradation threw Khomland, the fictional country of the opening scenario, into a state of extreme ecosystem and climate vulnerability. Ultimately, the participants’ coping strategies did not involve sincerely trying to arrest and reverse the ecological collapse that was underway. Some actions taken resulted in a worsening of the situation rather than its betterment. Teams did not necessarily exacerbate the crisis at every stage, but they failed to stop what was already a cascade of degrading and collapsing systems.

Despite the accelerating ecological and climate issues early on, teams diverted their attention toward infighting and Khomland was unable to cope. Rather than prioritizing protecting the environment as a step-zero for ensuring national security, societal breakdown emerged as the dominant issue. While the climate continued to change, and ecosystem services declined, life in Khomland grew rapidly worse without sufficient international support. The evolving ecosystem stresses, along with unchanging behaviors such as deforestation and corruption, further degraded the country’s resilience and stability. At the same time, governance structures protecting elites remained intact even as existential societal issues continued to undermine national conditions, and the government became increasingly authoritarian.
A November 2019 satellite image captures rapid deforestation along the Digul River on Papua, Indonesia.

Source: Lauren Dauphin / NASA Earth Observatory; data from Landsat and USGS.
Security Implications of Ecosystem Degradation and Collapse

Game Setting: Fictional Country in Southeast Asia

Southeast Asia, like many regions in the world, is facing a multitude of complex existential risks. Higher populations, growing economies, governance challenges and subsequent skyrocketing energy needs will be increasingly layered over ecological disruption. These include severe climate change impacts such as sea level rise, hotter temperatures, and extreme weather events as well as local ecological degradation via land use change, natural resource extraction due to both local and global demands, deforestation, biodiversity loss and much more. This web can lead to instability through a multitude of pathways including food insecurity, strains on local economies, geopolitical tensions, disease, and large-scale migration. This scenario exercise aimed to center a multi-year crisis in this region due to its unique geography, ecological importance— it holds some of the richest biodiversity in the world, rapid economic growth, and geopolitical implications.

Ecological Stressors

An important driver and feature of this game was the ecological tipping point. As ecosystems are degraded, they sometimes reach a threshold where the system suddenly shifts from one regime or stable state to another. For example, a productive coastal fishery, exposed to nutrient pollution, might experience
a series of harmful algal blooms. If these deplete dissolved oxygen, they may leave the system inhospitable to the fish it originally supported.¹

Biodiversity loss is likely to move ecosystems closer to these tipping points by decreasing their resilience to anthropogenic disruptions.²,³,⁴ Before and during the game, the fictional country of Khomland, the centerpiece of the exercise, experienced widespread biodiversity loss. The country had crossed at least two important ecological tipping points when the game commenced.

Land Use and Climate Change, Pollution, and Overfishing, Led to Aquatic Ecosystem Collapse

A number of anthropogenic activities and human-driven environmental changes in this game were examples of those that can lead to biodiversity loss and the collapse of freshwater and marine ecosystems. Deforestation and replacement with fertilizer-hungry agriculture can lead to nutrient and sediment runoff into streams and rivers. Nutrient pollution can lead to harmful algal blooms (HABs), which can release toxins that kill fish, make them unsafe for human consumption, and which can ultimately lead to oxygen depleted dead zones.⁵ Sediment pollution can physically interfere with benthic organ-

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isms and undermine photosynthesis, further damaging aquatic food webs. Poorly managed mining operations can leach heavy metals into waterways, which can accumulate in fish tissues, making them unsafe for consumption. Coal-fired power plants can deposit acidifying ions and leach toxic aluminum from soils into waterways. These pollutants can kill sensitive species. The increasing CO₂ concentrations causing climate change acidify ocean waters, undermining shellfish and corals. Increasing temperatures cause some fish species to shift their distributions out of national Exclusive Economic Zones, lead to coral bleaching and die offs, and decrease dissolved oxygen levels. Coral communities are nurseries for some species of fish and attractions for tourists. The same is true of mangrove forests, many of which are removed to make way for coastal development. All these stressors in combination with overexploitation, can lead to the collapse of aquatic ecosystems, including their food webs, and fisheries. This kind of collapse can lead to loss of livelihoods for those working in fisheries and tourism, leading to internal migration, and contributing to food insecurity and rising food prices.

Land Use and Climate Change Led to a Food Self-Sufficiency Deficit

This game presented a scenario where climate change interacted with land use change to undermine agricultural productivity. Diversity in the species and varieties of crops used in an agricultural system may increase the resilience of

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that system. Rice and other crop production concentrated in low-lying coastal and tidal zones is vulnerable to the effects of sea level rise as storm surges, high tides, and saltwater intrusion increasingly impact fields and soils. These effects may be exacerbated by the destruction of natural coastal “infrastructure” such as barrier reefs and mangrove forests. In the uplands, conversion of forests to alternative use may increase flooding of agricultural fields during extreme precipitation events. Extreme heat, and increasingly frequent and extreme wet and dry periods, may undermine crop growth and survival and the time farmers can spend tending fields. Combined, these impacts are likely to reduce yields where adaptive measures are not implemented. This disruption of agriculture may reduce food security, undermine livelihoods, and increase migration in search of new opportunities and social services. Due to reduced domestic production (food self-sufficiency) more food must be imported and food prices rise.

Land Use and Climate Change Dramatically Increased Flood Risk in Cities

While climate modeling can predict the changes in precipitation averages and variation that a region may experience in the future, the speed with which those changes occur, and the extremes they reach, could vary considerably. In this game, Khom experienced precipitation changes on the more rapid and extreme end of what is plausible by mid-century. The negative effects of increasing variability and extremes in precipitation on settlements, are likely to be greater in areas that have been heavily deforested. Forests hold soil and water. Without them, some regions will become more vulnerable to flooding and landslides. Where these events impact settlements, lives will be lost, livelihoods and food production disrupted, and property damaged or destroyed. Such communities are less secure and their populations may be displaced.

Scenario Exercise Results

Drawing on assumptions derived from prior research and efforts under the Council on Strategic Risks’ Ecological Security Program, the scenario simulated some of the social dynamics expected to be seen in such a crisis situation. Factions developed rather quickly within the groups and the basic antipathy between establishment forces and civil society/political opposition widened to the point of open conflict. International elements lacked leverage over the domestic forces at play, but felt themselves compelled to abide by restrictions imposed by the government team. Although the crises posited in this scenario were primarily driven by ecological and climate-related disruptions, by the second move the situation had devolved into an unrestrained political struggle devoid of cooperation for addressing the evolving ecological crisis-turned-civil conflict.

Key Takeaways

**Human-driven ecological disruption initiated a domestic security crisis.** Mismanagement of Khom’s ecosystems, and external pressures from climate change, led to the collapse of fisheries and coastal agriculture. The resultant food and job insecurity prompted large scale migration into cities.

**Climate change and other forms of ecological degradation catalyzed internal conflict.** Increasingly intense episodes of precipitation combined with upland deforestation made much of the country’s population centers and agricultural lands vulnerable to severe flooding. At the same time, extreme wet bulb temperatures during a mass demonstration killed thousands. These extreme events led to a spiraling conflict of extreme actions and responses between opposition groups and the government.
Society was not able to cope with the opening ecological crisis or its evolution. By the second move, players accepted the fate of Khom’s ecosystems and made pivots from actions intended to restore ecosystem services and solve the crisis toward ones intended only to manage it. Ecological mitigation, not restoration, was a more achievable goal given the lack of adaptation measures in place.

It would have been more efficient and effective to avoid ecological degradation than it was to restore ecosystems. Ecosystem restoration takes years of community cooperation, funding, and a commitment to monitoring and upkeep. These capacities were largely absent from a society experiencing an internal security and political crisis.

Player decisions often exacerbated rather than resolved the ecological crisis. The ecological situation forcibly shaped player decisions. Although play began with specific stressors and tipping points, followed by human action, this sequence was often obfuscated. As play progressed it became more difficult to distinguish between when human actions drove the ecological situation and when the ecological situation drove humans to act. Factional politics and unrest, catalyzed by job losses, food insecurity, and migration, largely distracted players from opportunities to restore ecosystems. Instead, ecological degradation was allowed to continue. This feedback loop between ecological degradation and insecurity and unrest only exacerbated the political crisis.

Competing actions driven by socio-economic and political aims also contributed to ecological disruption. International funds reached the pockets of elites instead of the ecosystems that desperately needed attention. Civil disobedience in response to corruption resulted in the death of thousands and created a hotspot for disease spillover. Disruptive agricultural practices also continued as people migrated from cities to rural areas in search of better livelihoods threatened by both the country’s security services and the crisis.

Rather than join forces to address the immediate impacts of ecological degradation, actors turned on one another. The government militarized its response to both the crisis and opposition from domestic political groups.
and civil society. As domestic actors turned against one another and vied for power, the international community became less incentivized to seek out financial support. Providing humanitarian aid became too precarious for risk-averse international NGOs.

**The political system turned from semi-democratic to a more authoritarian state.** The ruling elites amassed more power as the country’s situation worsened, in the name of preserving state stability. Ultimately, the crisis led to the end of the existing semi-democratic political system and the establishment of a more authoritarian state.

**Societal Dynamics During an Ecological Crisis**

**Government/Security Team**

The Government devolved into a concentrated authoritarian regime, exercising its power through the deployment of a paramilitary force, the “Conservation Corps,” created under the guise of a state-run ecological restoration and job creation program. From the onset, the Government team sought political stability and this desired end state did not shift throughout the game. Despite being met with fierce opposition from domestic political groups, civil society organizations (CSOs), and international criticism for its oppressive tactics, the Government managed to subvert resources and funds intended for ecological crisis management programs to support its elites.

The Government managed to maintain order through the invocation of a State of Emergency early on in the game. This allowed it to control the political opposition, which sought snap elections and power-sharing agreements throughout. Even when the severity of the crisis appeared to overwhelm the country’s resources, the team successfully negotiated increased international funding that it controlled and “dispersed” through its various militarized
adaptation response options. Anticipating civil unrest regardless of any policy it pursued, the Government positioned itself to either escalate its crackdown or flee at any time. Disaster relief and ecological restoration efforts were promoted as facades to elicit international aid to support this elite escape option.

At one point, the team publicly stated that the ecological crisis Khomland faced was the direct result of the failure of global powers to curb emissions, leaving the country to bear the burden of responsibility alone. This perspective shaped the Government’s conceptualization of its role in mitigating the situation. It adapted its actions to focus on addressing more immediate crises arising from the injects (specific events within the game that prompt players to explore different pivots and elicit unique reactions as players attempt to manage the unexpected), political opposition, and a lack of international support. The team ultimately committed to self-preservation from start to finish: the country’s ecological crisis stemmed from issues much larger than itself, meaning that solutions lie far beyond the scope of Khom’s Government as well.

**Domestic Civil Society Organizations (CSOs) / Political Groups Team**

The Domestic CSOs/Political Groups team began the game with immense distrust of the Government and its policies. Seeking to level the playing field politically, the team attempted to hold snap elections, build coalitions, and garner international aid without Government involvement in its distribution. Decentralizing national ecological adaptation planning and removing the militarized nature of the Government’s response quickly became priorities as the team navigated increasing restrictions on its ability to operate. As the crisis worsened following the first inject and the Government imposed its State of Emergency, Domestic CSOs/Political Groups struggled to both effectively address the situation and remain safe. Government crackdowns increased even with international criticism, but this outcry did not extend to direct support for the team as it faced the precarious implications of martial law.
Direct funding became a focal goal of the team as it encountered constant establishment bottlenecks and pushback from the international community. At every negotiation, international organizations refused to commit public support for the political opposition and would not agree to work around the Government to provide direct funding for domestic groups. Domestic CSOs/Political Groups instead began to follow through on their commitment to a long-term civil disobedience strategy by holding a mass general strike. The team sought a backchannel for communicating with moderates within the Government in hope of replacing elites in key ministries. Yet, this was largely unsuccessful, and only discouraged international aid as NGOs began to perceive the opposition as the main source of civil violence due to targeted Government propaganda.

In an attempt to increase the influence of the political opposition, the team began to sabotage elite infrastructure and spread disinformation. It also sought illicit capital flows to supplement the lack of international funding for its localized ecological restoration efforts, such as indigenous-led nature-based solutions to combat food insecurity. Domestic CSOs/Political Groups concluded by working to centralize their efforts at the local level. Faced with the severity of ecological collapse and lack of economic and political capital, some radical elements among the various groups began moving in the direction of a rebellion.

International Organizations/Non Governmental Organizations (NGOs) Team

The International Organizations/NGOs team represented a variety of actors in the international community which both the Government and Domestic CSOs/Political Groups looked to for financial support, investments in ecological restoration programs, and disaster relief aid. The team initially developed a conservative strategy centered on understanding the situation on the ground to inform the right diagnosis for how International Organizations (IOs) and NGOs could support both Khomland’s Government and domestic groups’ emerging responses. Team negotiators attempted to identify the immediate
needs of the other groups with a focus on promoting long-term planning and solutions for the rising threat of food insecurity.

In place of official commitments for sending aid directly to the increasingly corrupt Government, International Organizations/NGOs made promises to encourage the public and private sectors to invest in ecological restoration technology (e.g., geoengineering) and alternative energy sources to ensure the country’s prosperity. Meanwhile, the Domestic CSOs/Political Groups team began to put pressure on the international community to condemn the militarized crackdown on civil society, send international observers, and funnel aid directly to local groups without Government involvement. Hesitant to subvert the legitimacy of Khom’s Government, the team refused to make such commitments and endorsements requested at the negotiating table.

Following the rise in civil unrest after the tragic strike in 2041 and rumors of the Conservation Corps-led genocide, the team began a strategic shift by removing itself from the competition between the Government and political opposition. Progress during the final rounds of negotiations stagnated further as the team looked for investment activities and aid pathways that would not involve the two. These ranged from proposals for regional ecological development and donor conferences to programs for humanitarian aid and ecological intervention launched with smaller domestic CSOs and NGOs. The infighting within Khom ultimately dissuaded International Organizations/NGOs from supporting ecological restoration efforts that were unlikely to succeed in such a climate of unrest.
Recommendations

During the concluding plenary, participants were asked to provide recommendations to help guide policymakers, advocates, and experts in the field to prevent and prepare for the range of security-related breakdowns encountered during the game.

International

Translate the security risks posed by ecological degradation and collapse. Participants recognized the inherent risk of ecological degradation and how local ecological collapse can eventually scale up to impact regional security. They noted that governments and IGOs—specifically their corresponding security agencies—had not internalized this risk. Targeted outreach, education initiatives (e.g. scenario exercises), and ongoing collaboration are essential in order to elucidate the catastrophic risks posed by multifaceted ecological emergencies. Security communities must prepare responses and prevention strategies to address ecological insecurity. Along these lines, the United Nations Security Council (UNSC) should engage ecological security at the same level as climate security.

Direct early and upstream investments in governance and stability. Participants also stressed the importance of early and upstream investments in strengthening governance and stability. This will ensure local organizations and state entities have the foundation to respond to complex crises when they emerge. As noted during the exercise, well-governed societies are able to cope better. As such, governments must take the lead on immediate ecological action and establish clear commitments. Another example centers on boosting wealth for local communities today in order to establish a more stable baseline during emergencies. In places where population displacement is inevitable due to forecasted ecological conditions, governments should earmark resources for future response efforts to ensure states can responsibly navigate impending
displacement. Other examples include incentivizing societal solutions and incorporating ecological emergency management in disaster planning. Early and targeted preparation prevents catastrophic impacts from completely overwhelming government capacities, as was experienced during the game.

**Prioritize conservation and disincentivize environmental damage.** Participants noted that ecological destruction should not be “free.” All sectors of global society (IGOs, NGOs, governments, and the private sector) should work to support an economic reform to “price” ecosystem services and environmental damage. Communicating the economic value provided by these integral ecosystem services will help reluctant actors recognize their benefits and the costs of their degradation and loss. Such efforts should integrate natural capital accounting, payments for ecosystem services, and other mechanisms for valuing nature in economies and markets. Local CSOs should be consulted to ensure communities are considered, supported, and involved in these efforts.

**Increase aid for and investment in adaptation and resilience.** Local communities, governments, and NGOs need support to adapt to ecological degradation and build more resilient societies. For example, some participants noted the explicit need for ecological financing for the public sector, fisheries reform, and more. Applying nature based solutions is a critical component to bolstering societal resilience during ecological emergencies; e.g. resilience to increased flooding could be strengthened by restoring upland forests, wetlands, and coastal ecosystems like mangroves. These investments should be designed to withstand worst case ecological scenarios.

**Enhance cooperation between international financial institutions (IFIs) and provide flexible ecological and climate finance.** Incumbent IFIs (e.g. Bretton Woods) must find pathways to increase cooperation with LMICs to bolster their resilience during ecological emergencies while there is still time. Lower and middle income countries also need support to build out zero-carbon energy infrastructure.
Build the capacity to quickly deploy hybrid responses to ecological emergencies. There is a clear need to augment global institutional capabilities to be able to deliver complex humanitarian, developmental, reparative, and structural responses during complex ecological crises. Along these lines, IGOs should prepare to respond to issues such as mass displacement and food insecurity, and governments should consider more flexible policies for absorbing and hosting displaced peoples. At the same time, organizations must be able to rapidly deploy solutions aimed at strengthening communities through climate adaptation and ecosystem restoration.

Harness technology to make agriculture more resilient and regenerative. Tools like drones, GPS, drip irrigation, GMOs, AI, and precision agriculture can reduce water and fertilizer use and enable farmers to adapt to changing climate conditions. Fund research in, and subsidize, agricultural practices that rebuild and protect ecosystem function, biodiversity, and reduce emissions while maintaining yields.

Launch a global ecological security conference or an “Office for the Coordination of Ecological Security.” Such a venue could provide an opportunity to integrate the broad range of knowledge and perspectives necessary to engage with the universal and existential threat of ecological degradation. Likewise, establishing an entity that approaches ecological security in a similar way as humanitarian relief could launch this field into focus for many international organizations and governments. Climate security has gained traction in these spaces and it is time for ecological security to be viewed with a similar level of urgency and priority.

Regional

Improve environmental and ecological literacy. Participants suggested that improving environmental and ecological literacy, particularly in Southeast Asia, would be essential. Some participants remained skeptical that civil society would agitate on behalf of the environment because the connection between
climate change, environmental degradation, and reduced human security is not widely appreciated. Without these values and knowledge, the public cannot be expected to demand environmental quality from their governments.

**Combat or circumvent corrupt networks and actors.** Some regional subject matter experts noted how elites in this region are likely to have captured their political systems, nonprofits, and businesses, undermining the ability of external actors (e.g., NGOs, development banks, etc.) and domestic civil society to influence ecological outcomes in general, and societal outcomes in a time of crisis. This corruption thwarts the efficacy of external aid, investment, and influence campaigns. Likewise, disenfranchised domestic opposition groups struggle to coexist with self-serving elites who acquire the food, funds, and tools of coercion that allow them to maintain power regardless of the state of their citizens. This type of corruption extends beyond Southeast Asia, and is something that can be mitigated through improved transparency by proactive governments and direct support for civil society from the international community.

**Tailor aid to local contexts.** External interventions need to be informed by local actors. For example, aid to local health, nutrition, or environmental NGOs that come with social and political strings attached, may make these groups targets for security services. Additionally, sending international project managers or observers in combination with aid is one pathway for mitigating the risk of aid being weaponized or diverted away from those most in need.

**Train and recruit experts who understand regional power dynamics.** There are too few experts among the NGOs and international organizations that work in Southeast Asia who understand the power dynamics of the region. Without this expertise, these organizations are unlikely to be effective in achieving their aims and may cause more harm than good. Requirements for the involvement of indigenous stewardship at every phase of an aid program or mission is one possible solution to help fill this gap.
Conclusion

Ultimately, this scenario exercise spotlighted multiple trends that must be incorporated into security analysis. Perhaps most importantly for a game centered on ecological disruption: there was a critical apex during which ecological concerns were completely overtaken by day-to-day considerations and the mitigation of societal breakdown. In other words, ecological issues ultimately took a ‘back seat’ amongst the chaotic and multifaceted emergencies. To further complicate this reality, there were a range of perspectives regarding the state of ecological degradation. Some participants felt the ecological issues were overstated—creating an environment where it was impossible to develop credible, restorative practices that could quickly address opening scenario conditions. Others posited that the ecological disruption risks were not extreme enough e.g. the exclusion of the disease spillover / loss of biodiversity / migration / famine nexus. It is clear that wide-scale ecological disruption could lead to and exacerbate instability—and that the more this disruption is permitted to unfold, the less opportunities there will be to reverse the damage. The implications for how this will influence global societies cannot be overstated.

Another key thread uncovered throughout the game centered on the notion that in the face of ecological disruption, ruling elites would consolidate power, rather than lose it. Participants noted that the system, even when faced with multiple cascading existential threats, is still heavily stacked in favor of ruling elites. During the game, elites were able to navigate the crises and survive state fragility—and it was noted that it would take far more for elite systems to completely collapse. Along those lines, a complex crisis with roots in severe ecological degradation can undermine the existing governance structure and tilt a government towards the extreme end of the political spectrum. In this case a semi-democracy transformed into an authoritarian state. Participants noted that this response reflected a plausible pathway not only in the game’s own geography, but across the globe. The game design also intentionally excluded great powers in order to center the exercise on how one country would respond to such threats. Clearly, the role of the United States, China
and others will shape the ways in which any state will be able to respond to a multi-year crisis—and further influence and/or strain geopolitical alliances.

This exercise also confirmed that in order to bolster societal resilience in the face of growing existential risks, ecological issues must be elevated as a global security concern in the extremely near term. The protection and prioritization of ecological services and ecosystems is a fundamental ‘step zero’ to addressing and mitigating against future insecurity. Not doing so undermines global stability and sets the stage for long-term irreversible implications.
Annex

Summary of Game-Play

The game opened with a plenary meeting of all the participants to introduce the scenario, explain the procedures, and answer questions. Play proceeded in three moves, taking roughly a half-day for each move. Each team was assigned a facilitator and notetaker to guide discussions and capture player responses on worksheets for each move.

Each move was divided into three phases. In the first phase, participants discussed the scenario, what their goals should be, what obstacles they faced, how they thought their group should respond, and whether to negotiate issues with other groups. The second phase was for negotiations, where team representatives met to try to reconcile differing viewpoints and strike agreements over goals and actions. In the third phase, negotiators briefed their teams on their negotiations, teams reconsidered and updated their goals, and decided on the specific actions that would comprise their move.

After each move, the participants reconvened in a plenary session to explain their specific action plans and then consider how the outcome of all the teams’ decisions together reshape the scenario. This new situation then became the basis for the next move.

After the third and final move, all of the participants reconvened in a concluding plenary to discuss the outcomes, lessons learned, possible takeaways and real-world recommendations, and to critique the game design and process itself.

Control intervened with three “injects” at different points in the game. In scenario exercises, injects are specific events within the game that prompt players to explore different pivots and elicit unique reactions as players attempt to manage the unexpected. The first inject, “Floods and Heat” came after the...
first move and created further ecological stressors. The second, “The Protests of 2041,” was introduced in the middle of the second move and forced players to cope with further social unrest and the ways in which the rapidly declining ecological situation exacerbated this. The final inject, “Khomland Post-2041,” came before the third move and introduced deeper ecological security implications following the actions undertaken at the end of move two.

Opening Scenario: The Ecological Crisis of 2040

Local Factors

During the 2020s and 2030s, Khomland focused on raising living standards through new industries and investment in manufacturing and plantation agriculture. The government pressed ahead with new coal-fueled power plants, driven in part by the desire to rapidly extend electricity to all of Khomland and in part by crony relationships between national politicians and the owners of power plants and mines. Plantations for palm oil and commercial tropical lumber resulted in extensive deforestation and destruction of natural habitat, loss of biodiversity and watershed sustainability. This in turn increased the frequency of peatland wildfires during the dry season and, during the rainy season, severe flooding and landslides from larger, heavier “deluge events.” The runoff of soils, fertilizers, chemicals, and plastics into the riverine and marine environments added substantially to the stress on these ecosystems.

Khomland officials by 2040 had taken few actions to manage its fisheries and marine resources aside from creating a couple of marine reserves in tourist areas. Officials lacking the resources to police overfishing by international commercial fishers looked the other way as regional fish stocks continued to decline from overfishing. Despite repeated warnings from the country’s small community of marine scientists that pollution, overfishing, and warming were overwhelming offshore reef systems and fish populations, the extensive collapse of marine ecosystems in the 2030s took the Khom government by surprise. Khomland had depended on its fisheries for about one-third of its protein consumption, substantial exports, and tens of thousands of jobs.
Officials projected that the marine economy—fishing, shellfish, tourism, even seaweed harvesting—would be non-existent by 2045.

Prolonged heat waves and irregular rainfall patterns (floods alternating with droughts), sea level rise and saltwater intrusion in low-lying regions, combined to drive down crop yields, especially Khomland’s once-abundant rice cultivation. Past surpluses vanished; the country was more often facing a food deficit, while imports were increasingly scarce and expensive. Agricultural ministry officials calculated that the country would face the threat of famine in a few years time unless it could replace lost rice harvests and protein sources.

In 2040, as ecological impacts made rural livelihoods increasingly precarious, more of the population migrated to the cities, where municipal governments struggled to arrange housing, services, and opportunities for jobs. By 2040 the urban poor were increasingly restive, blaming the government for housing shortages, unemployment, and rising food prices. Proposals in the media to relocate population and industries into the highlands generated intense resistance from highland populations, who feared being overrun by a flood of impoverished lowlanders.

Khomland’s neighbors were in even worse shape; ecological issues were driving both internal disorder and population displacement in neighboring countries, with large numbers of refugees crossing Khomland’s borders. Local officials warned that they lacked the resources to shelter and feed the refugees, while local populations were increasingly antagonistic towards potential competition for limited land and precarious food supplies. A “Migrants, Go Home” movement had taken shape in the cities and the countryside, with ugly incidents between locals and refugees occurring more often.
Global Factors

During the 2020s and 2030s, global warming effects continued to unfold at a rate that exceeded scientific projections. As the planet approached, then exceeded, 1.5°C of warming in the 2030s, it became apparent that the warming was triggering certain regionally-critical tipping points, such as more rapid sea-level rise, ocean acidification, and changes in ocean circulation and rainfall patterns. These in turn were accelerating the arrival of the more dire ecological consequences of warming. Scientists noted that the rising temperatures threatened to trigger irreversible feedback loops by releasing additional carbon and methane from natural sources like the Amazon basin and Arctic permafrost.

By 2040, sea levels had risen a full foot above 2020 levels, and the more extensive than anticipated melting of the Greenland ice sheet and of Antarctic glaciers were projected to produce additional sea level rise in the coming decades. Loss of mangrove forests—in large part due to anthropogenic habitat destruction—and coral reefs led to increased intrusion from storm surges and extreme tides, worsening the impact of rising sea levels. High-tide and storm inundations in Khomland’s delta region affected almost 60 percent of its rice-growing areas. Sea level rise produced similar inundations in most of the offshore coral atolls, although the larger volcanic islands were less affected. Sea level rise was projected to eventually bring the Gulf of Thailand to the southern suburbs of the capital, threatening about one-third of the city with periodic tidal floods, including many residential and industrial areas. Officials in the environmental, economic, and agricultural ministries were quietly but urgently warning that up to one-third of the population and of Khom’s industries might need to be protected or relocated by 2050.

Global food prices were dramatically escalating even as Khomland’s ability to pay for imports was falling. Prospects for international aid were low; unlike previous natural disasters, the global effects of warming and accumulated ecological degradation meant that many countries were suffering climate effects and ecosystem service declines simultaneously. Warm temperatures, habitat loss, and pesticide use led to a widespread loss of pollinators; algae blooms and
coral reef die-offs damaged coastal fisheries; many major overfished and polluted ocean fisheries collapsed. Crop shortfalls in major breadbasket regions for several years during the 2030s meant that global food reserves were almost nonexistent; there was fierce competition for the resources that remained.

While the world as a whole was producing enough food, repeated supply shocks caused by regional droughts and crop shortfalls made the system unstable. Many food producers, fearing future shortages, banned food exports, further reducing the amounts available to cushion regional shortfalls. Many countries, in addition to Khomland, experienced these pressures as unpredictable price shocks.

Ending Scenario: The Ecological Crisis Post-2040

Local Factors

Between 2040 and 2043 the Khomland Government’s focus on stabilizing its political situation, attracting international partners, and protecting its elites pushed the country into further ecological crisis and social divide. The Government failed to prioritize viable ecological restoration policy options and instead sought to grow its security forces in an effort to militarize its response. Presented as a means to create jobs and redirect opaque funding to equally opaque ecological restoration activities, the Government created the “Conservation Corps:” a paramilitary organization focused on fisheries enforcement, disaster relief, and job training.

By doubling down on its militarized response, the Government was met with widespread opposition from domestic civil society and political opposition groups. Efforts to raise Khom’s living standards during the 2020s and 2030s through manufacturing and destructive agricultural practices instead created resource instability and civil divide. Citizens living in the rural countryside were the first to experience the impact of the ecosystem stress in part created by such practices. Domestic civil society pursued a strategy of political power-sharing and direct support from international organizations and aid communities as a
means to divert funding pathways away from the corrupt Government. This effort went largely ignored by international organizations, regional financial institutions, and international NGOs, who remained in favor of preserving the status quo by only working with governments, even corrupt ones.

In mid-2040, climate forecasts for Khomland for the next five years (2041-46) predicted a high and rising risk of catastrophic flooding and landslides due a combination of warming temperatures, changing rainfall patterns, and continuing deforestation and biodiversity loss in the Khom River watershed. Models predicted a 70% possibility of massive flooding during a near-future rainy season that would submerge up to 40% of the capital and displace up to 7 million people. Meteorologists also warned of the increasing risk of lethal “wet bulb” temperature heat-waves affecting the region. By 2041, several such events had already led to significant loss of life in the Persian Gulf region and in South Asia.

These climate models indicated similar events could be expected in Khomland over the next five years. This was unfortunately the case by 2041. In protest of the Government’s invocation of a State of Emergency following these reports on the rising risk of floods and heat, the political opposition, the Green Shoots Party, organized a mass general strike one evening. In an attempt to maintain order, the Government imposed an evening curfew under strict martial law. Rather than changing their strategy, the Green Shoots Party ignored warnings and organized the strike to be held during the day. One million protesters took to the streets; however, this coincided with the worst heat wave in Khom’s history. Thousands of citizens died on the streets in the infamous “Protests of 2041.”

Following this tragic day in Khomland’s history, the Government refocused its priorities toward using the Conservation Corps to fund and secure its elites. Domestic civil society and political groups began to lose faith in international support without Government strings attached, and instead turned to a long-term strategy of civil disobedience. Meanwhile, the international community grew to distrust both the Government and domestic political groups vying for power—instead pursuing regional donor engagement strategies to fund disaster relief programs to meet the immediate needs of Khom’s citizens.
Combined, these efforts largely ignored the ecological crisis as both national and international actors abandoned hope for ecological restoration, instead accepting that the situation could only be managed, not solved. Ecological mitigation, not restoration, became the buzzword for international organizations struggling to determine where to allocate funding in such a precarious climate.

The Government began its commitment to conscription in 2042. The Conservation Corps continued to amass power and started its own ecological risk management activities with funding from the international community. International organizations sent teams of observers to monitor local humanitarian aid programs and the Government’s use of investments intended for supporting nature-based and engineered solutions (e.g., reforestation, environmental engineering, etc.) to mitigate the impact of heat, floods, and the resulting disease spillover risks.

By 2043, approximately one-third of the population lived in urban shantytowns, displaced persons camps, and resettlement villages. Discontent remained high because of the shortage of basic services and rising food prices. Changing rainfall and regional weather patterns created alternating periods of severe drought and prolonged heat waves, followed by intense rains and heavy flooding. Deforestation and biodiversity loss made the landscape less resilient to these stresses. Government policies remained reactive, rather than proactive.

No elections were held as per the 3-year long State of Emergency. In response to appeals for aid from both Khom’s Government and its domestic political groups, global and regional powers issued supportive statements and encouraged countrywide stability. However, none committed to lending aid, as each faced its own risks of ecological collapse.

International NGOs eventually provided specific funding for domestic CSOs to manage ecological risks—specifically for reforestation efforts and resource aid for farmers to manage rising food insecurity. However, this aid came with the caveat that all activities would be overseen by an international monitoring group to ensure funding reached its intended use after rumors of illicit
smuggling and sabotage circulated around the Green Shoots Party. As a result of their direct assistance for farmers and activities within rural communities, the Green Shoot Party’s popularity flourished while its political influence remained nascent.

By the end of the game, Khomland faced deeper risks of both ecological and societal collapse compared to its state in 2040. Citizens were on the brink of rebellion, the Government continued to preserve its self-interests over those of the nation, and the international community had little trust that it could have enough of an impact on the unfolding political crisis or widespread ecosystem collapse.
Ecological Risk in a Future Southeast Asia: An Ecological Security Policy Game