

COMPOUND GENDER-
CLIMATE-SECURITY
THREATS AND
VULNERABILITIES
WITHIN THE
INDO-PACIFIC

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Compound Gender-Climate- Security Threats and Vulnerabilities within the Indo- Pacific

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Pacific Forum

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EXECUTIVE SUMMARY

In 2021, signs of climate change intensification were evident in unprecedented wildfires, floods, cyclones, landslides, suggesting that climate-security threats are intensifying as well. Home to several rising powers and strategic trading partners, the Indo-Pacific is a vital region for the United States, yet it is one of the most vulnerable regions in terms of climate threats. A McKinsey report states that, “Asia stands out as being more exposed to physical climate risk than other parts of the world in the absence of adaptation and mitigation.”¹ Other research has shown that Asian countries have the highest numbers of people exposed to climate hazards such as floods, droughts, and storms.²

Climate change is an emerging security risk, and one that deserves greater study given the significant diversity of security and climate scenarios. In particular, the role of women as sources of climate security intelligence has been understudied. This paper aims to correct that oversight and assess which countries within the Indo-Pacific have the greatest combined gender-climate-security risk factors and why. A detailed breakdown of data from several indices related to fragility, gender inequality, conflict, and climate change is summarized for all countries within the area covered by the US Indo-Pacific Command (INDOPACOM) in [Table 1](#). Using this data, this paper examines in greater depth Bangladesh, Fiji, Indonesia, Myanmar, Philippines, and Vietnam—due to their diversity in environmental conditions and political conditions—to determine their specific gender-climate-security challenges. This paper begins with an overview of a gender-climate-security framework, provides focus country assessments, examines US INDOPACOM’s greatest vulnerabilities, and explores ways in which women may act as bellwethers of emerging climate-related conflicts if meaningfully and consistently consulted.

¹ “Climate Risk and Response in Asia” (McKinsey Global Institute, November 24, 2020), 7, <https://www.mckinsey.com/business-functions/sustainability/our-insights/climate-risk-and-response-in-asia>.

² Joshua Busby et al., “In Harm’s Way: Climate Security Vulnerability in Asia,” *World Development* 112 (December 1, 2018): 88–118, <https://doi.org/10.1016/j.worlddev.2018.07.007>.

A GENDER-CLIMATE-SECURITY FRAMEWORK

Climate change does not cause conflict, but instead is considered a threat multiplier because of the ways in which it aggravates already fragile states and its potential to fuel social upheaval and violent conflict.³ Climate change intensifies existing risks, hazards, disasters, and insecurities, which alone or in combination can increase security threats.⁴ The greatest risks of climate-fueled violence occur in states that are already weak or overburdened—those without additional capacity to absorb shocks. A G7 report on climate and fragility states, “As a threat multiplier, researchers have found that climate change drives a diverse set of ‘secondary risks, such as violent conflict, political instability, population displacements, poverty, and hunger.’”⁵ Since climate change is an existing threat that will intensify, global warming is expected to threaten seemingly stable states and may push many toward conflict.⁶

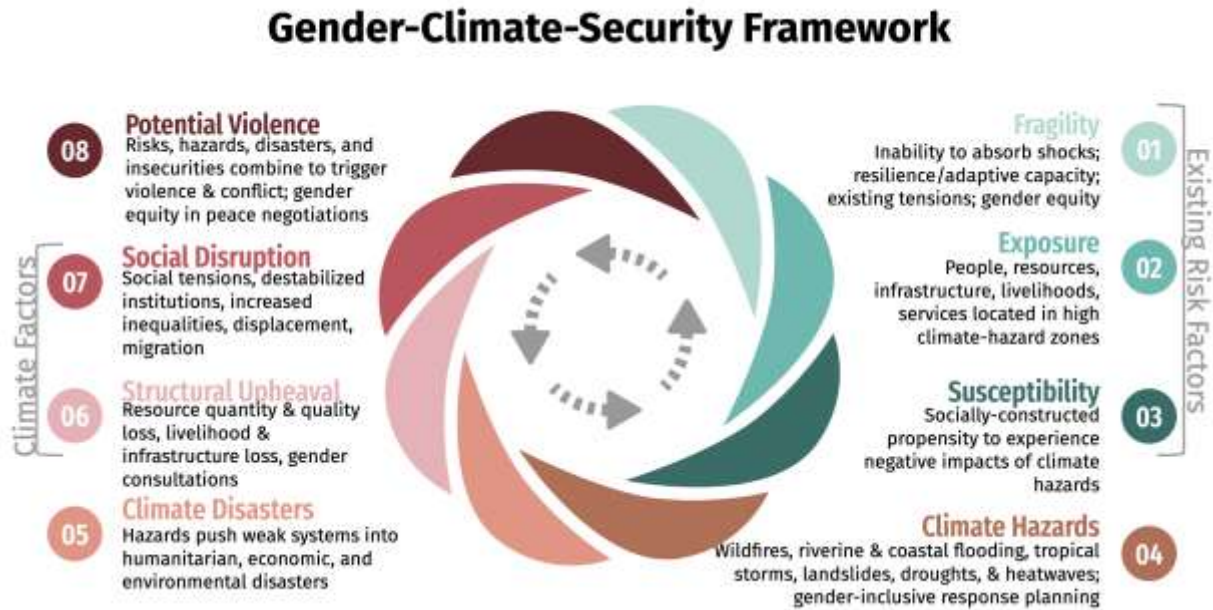


Figure 1: Gender-Climate-Security Framework—Expansion and reinterpretation of the gender-climate-conflict framework developed by The Hague Centre for Strategic Studies (HCSS), with the addition of a gender lens

In a 2017 G7 report, members identified seven compound climate-fragility risks that pose serious threats to global stability: local resource competition; livelihood insecurity and migration; extreme weather events and disasters; volatile food prices and provision; transboundary water management; sea-level rise and coastal degradation; and unintended effects of climate policies.⁷ This paper assumes

³Adelphi et al., “A New Climate for Peace: Taking Action on Climate and Fragility Risks, An Independent Report Commissioned by the G7 Members” (Berlin: G7 Environment, Conflict, and Cooperation, 2015), 5, <http://www.newclimateforpeace.org>.

⁴Femke Remmits, Elisabeth Dick, and Michel Rademaker, “Climate Security Assessment: A Methodology and Assessment of the Nexus between Climate Hazards and Security of Nations and Regions” (The Hague: The Hague Centre for Strategic Studies, December 2020), 29, <https://hcss.nl/wp-content/uploads/2021/01/Climate-Security-Assessment-March-2021.pdf>.

⁵ Adelphi et al., “A New Climate for Peace: Taking Action on Climate and Fragility Risks, An Independent Report Commissioned by the G7 Members,” 5.

⁶ Adelphi et al., “A New Climate for Peace: Taking Action on Climate and Fragility Risks, An Independent Report Commissioned by the G7 Members,” 6.

⁷ Adelphi et al., “A New Climate for Peace: Taking Action on Climate and Fragility Risks, An Independent Report Commissioned by the G7 Members.”

all these factors are threat multipliers, and using the framework depicted in [Figure 1](#), includes the following factors: risk factors such as (1) existing fragilities, (2) exposures, and (3) susceptibilities; (4) environmentally-specific climate stressors, including hazards (examined in depth later) and (5) disasters; which combine to produce certain insecurities such as (6) structural upheaval, (7) social disruption; which may ultimately generate (8) potential violence. Throughout this paper, probabilistic language will be used to convey relative risks and vulnerabilities, ranging as follows: extremely high / significantly high / high / moderately high / somewhat high based on the combination of the eight risk factors measured here, with “extremely high” indicating substantial and frequent risks to vital resources and food systems that could severely impede economies, living and working conditions, and ultimately political stability. On the low end, “somewhat high” indicates only small and intermittent disruptions that pose little risk to national stability.

EXISTING RISK FACTORS

Gender is an important factor to consider when assessing climate risk factors. Research by Valerie M. Hudson has shown that the treatment of women at home informs human interactions throughout society, and as such, communities that severely subordinate women to men⁸ also tend to have worse governments, economic performance, health outcomes, and demographics.⁹ UN Women has found that the 10 countries with the worst maternal mortality records also experience girls’ educational enrolment rates 17 points below the global average—and they are all considered conflict-affected or post-conflict.¹⁰ Gender norms and ideologies can also fuel violence and conflict. For instance, military and political actors may deliberately manipulate aggressive and dominant ideas of “being a man” to recruit men into armed groups.¹¹ In international conflict, the severity of violence tends to decrease as gender equality increases.¹² Furthermore, sexual and gender-based violence (SGBV) is known to destabilize communities, hindering recovery following crises, and eroding trust in rule of law and institutions.¹³ The safety and protection of women, therefore, is an essential measure of a state’s climate risk.

Conversely, empowered women can reduce fragility, be positive stabilizers against conflict, and be sources of climate solutions and resilience. For example, research by Hudson and others has shown that when women can participate meaningfully in the formal economy, gender equality increases along

⁸ Valerie Hudson’s US Department of Defense-funded research has shown that “severe subordination” of women, measured through indicators such as discriminatory marriage and divorce laws, bride prices, dowries, and polygyny – what she calls the “first political order” – is a good measure of a state’s tendency toward political violence, domestic terror, and poor governance.

⁹ Caitlin Clark, “What You Do To Women, You Do To Your Nation,” *Texas A&M Today*, March 30, 2020, <https://today.tamu.edu/2020/03/30/what-you-do-to-women-you-do-to-your-nation/>.

¹⁰ “Chapter 4: Protecting and Promoting the Rights and Leadership of Women and Girls in Humanitarian Settings,” in *Preventing Conflict | Transforming Justice | Securing the Peace: The Global Study on the Implementation of United Nations Security Council Resolution 1325* (UN Women, 2015), 77, <https://wps.unwomen.org/pdf/CH04.pdf>.

¹¹ Hannah Wright, “Masculinities, Conflict and Peacebuilding: Perspectives on Men through a Gender Lens” (Saferworld, October 2014), <https://www.saferworld.org.uk/resources/publications/862-masculinities-conflict-and-peacebuilding-perspectives-on-men-through-a-gender-lens>.

¹² Mary Caprioli, “Gendered Conflict,” *Journal of Peace Research* 37, no. 1 (2000): 51–68.

¹³ Robert Jenkins and Anne-Marie Goetz, “Addressing Sexual Violence in Internationally Mediated Peace Negotiations,” *International Peacekeeping* 17, no. 2 (April 2010): 261–77, <https://doi.org/10.1080/13533311003643509>.

with the strength of local economies.¹⁴ UN Women has stated that, with full economic empowerment worldwide, women could add \$28 trillion (26%) to the global economy.¹⁵ Figures from UN Women also suggest that, since women reinvest 90% of their income into their families and communities (compared to men who reinvest only 35%), health and education levels tend to rise when women have greater autonomy over their work, which also builds resiliency into communities.¹⁶

The following analysis on the interaction of gender, climate change, and conflict provides an overview of risk factors based on a combination of ranking systems (see [Table 1](#)), most of which have been analyzed previously by this author and found to be generally lacking a meaningful inclusion of gender.¹⁷ The Global Climate Risk Index studies the extent to which countries have been impacted by climate-related weather events, and provides contextualization of climate policy debates, but makes no mention of gender factors.¹⁸ The Fragile States Index covers 178 countries, evaluating each based on pressures they experience, such as loss of livelihood, inequality of access to resources, land, water, and forests, and their ability to manage them.¹⁹ Several indicators could potentially include gender—indicators under “Cohesion” called: C2: Factionalized Elites and C3: Group Grievance; an “Economic Indicator” called: E2: Uneven Economic Development; a “Political Indicator” called: P3: Human Rights and Rule of Law; and a “Social Indicator” called: S1: Demographic Pressures—but none of them do so. The ND-GAIN Country Index examines conditions in 182 countries, measuring climate vulnerability combined with other global challenges and readiness to improve resilience, but again, makes no mention of gender considerations.²⁰ As such, in exploring existing risk factors below, this report adds a gender layer by including the Gender Inequality Index (GII) (relative rank and absolute score) within Existing Risk Factor 1.²¹

Existing Risk Factor 1: Fragility to Stressors and Pressures

The fragility of a country is a measure of its vulnerability to pressures and stressors and its ability to recover and maintain political stability following crises. In essence, it refers to a country’s ability to plan for, mitigate, and prevent stressors such as climate hazards from developing into serious disasters, and as such fragility is an important factor to consider when assessing gender-climate-security risks in the Indo-Pacific.²² Fragility of the countries analyzed in this paper is measured in two ways: first by the Fragile States Index framework and second by the GII. The Fragile States Index is an annual ranking of 178 countries using social, economic, and political factors to determine pressure levels on a country’s stability and their capacity to manage those pressures (higher score and/or lower rank

¹⁴ Valerie M. Hudson et al., “The Heart of the Matter: The Security of Women and the Security of States,” *International Security* 33, no. 3 (January 2009): 27, <https://doi.org/10.1162/isec.2009.33.3.7>; “Facts and Figures: Economic Empowerment,” UN Women, accessed January 31, 2021, <https://www.unwomen.org/what-we-do/economic-empowerment/facts-and-figures>.

¹⁵ “Facts and Figures: Economic Empowerment.”

¹⁶ “Facts and Figures: Economic Empowerment.”

¹⁷ “Contextualised, Spatially-Explicit Climate-Security Modeling Is Impossible without a Gender Lens: The Imperative of Mainstreaming Gender in Indices and Reports,” *LSE Women, Peace and Security Blog* (blog), November 12, 2021, <https://blogs.lse.ac.uk/wps/2021/11/12/contextualised-spatially-explicit-climate-security-modeling-is-impossible-without-a-gender-lens-the-imperative-of-mainstreaming-gender-in-indices-and-reports/>.

¹⁸ “Global Climate Risk Index | Germanwatch,” accessed July 31, 2021, <https://germanwatch.org/en/cr>.

¹⁹ “Fragile States Index | The Fund for Peace,” accessed July 31, 2021, <https://fragilestatesindex.org/>.

²⁰ Marketing Communications: Web // University of Notre Dame, “Notre Dame Global Adaptation Initiative | ND-GAIN,” Notre Dame Global Adaptation Initiative, accessed July 31, 2021, <https://gain.nd.edu/our-work/country-index/rankings/>.

²¹ “Gender Inequality Index (GII) | Human Development Reports” (United Nations Development Programme, 2020), <http://hdr.undp.org/en/content/gender-inequality-index-gii>.

²² Remmits, Dick, and Rademaker, “Climate Security Assessment,” 26.

indicate a higher level of fragility).²³ [Table 1](#) has a summary of important indicators for all Indo-Pacific countries. The GII is a United Nations Development Programme index that tracks gender inequality in 162 countries based on three elements: reproductive health (maternal mortality ratio and adolescent birth rates), empowerment (women holding parliamentary seats and percentage of adults 25+ years with at least some secondary education), and economic status (labor market participation). Adding GII to the three security and climate indices already mentioned offers important information on the gender dimensions that underpin a state's level of vulnerability to climate-related conflict risks.

According to the Fragile States Index, Bangladesh, Myanmar, and the Philippines are very or extremely fragile with relatively low GII rank and are therefore highly vulnerable to instability; Fiji and Vietnam are moderately fragile states with mid-range GII ranks; Indonesia is slightly less fragile but has a fairly low GII rank. These countries' climate adaptation plans vary: several limit marginalized stakeholders' access to resources (including women), an exclusion that is likely to fuel conflict between those with competing interests.²⁴ When scarcity leads to the exclusion of women from access to resources, land, and financing mechanisms, it can reduce agricultural and economic productivity as well as community health and wellbeing.²⁵ Excluding women from access to resources therefore may put a state on an unstable footing.

Further, climate coping strategies developed by Indo-Pacific countries to reduce their fragility are likely to entrench class and ethnic hierarchies, which tend to displace and impoverish powerless populations, as well as aggravate and intensify violent conflict.²⁶ Although women are projected to experience greater negative impacts of climate change than men, gender norms frequently result in the exclusion of women from climate mitigation strategies.²⁷ Additionally, if climate adaptation and mitigation plans are carried out as designed, they are projected to delay attainment of gender equality by up to 20 years.²⁸ It is worth also noting that all but one of the countries in the region recorded a 10-year negative shift in fragility (see [Table 1](#)).

Existing Risk Factor 2: Exposure to climate

Exposure refers to the degree to which a given element (including people, infrastructure, resources, ecosystems, institutions, and economies as outlined by The Hague Centre for Strategic Studies (HCSS)) is exposed to a climate hazard. This can reflect the nature of a geographic location or the lack of protection. Regardless of cause, however, the climate hazard exposure of a given country's vital resources (people, raw resources, livelihoods, ecosystems, infrastructures, or services) will impact the state's ability to recover and maintain political stability following crises. Large percentages of the Indo-Pacific's vital resources will be impacted adversely due to severe climate hazards in areas of high exposure.

²³ "Fragile States Index 2020 – Annual Report" (The Fund For Peace, May 2020), <https://fragilestatesindex.org/2020/05/08/fragile-states-index-2020-annual-report/>.

²⁴ Benjamin K. Sovacool, "Bamboo Beating Bandits: Conflict, Inequality, and Vulnerability in the Political Ecology of Climate Change Adaptation in Bangladesh," *World Development* 102 (February 1, 2018): 183–94, <https://doi.org/10.1016/j.worlddev.2017.10.014>.

²⁵ "Women's Economic Empowerment: Issues Paper" (OECD, April 2011), 18, <https://www.oecd.org/dac/gender-development/47561694.pdf>.

²⁶ Sovacool, "Bamboo Beating Bandits."

²⁷ Yianna Lambrou and Grazia Piana, "Gender: The Missing Component of the Response to Climate Change" (Food and Agriculture Organization of the United Nations, 2006), 45, <https://www.fao.org/3/i0170e/i0170e00.pdf>.

²⁸ "Why Climate Action Needs a Gender Focus," BCG Global, October 26, 2021, <https://www.bcg.com/publications/2021/climate-action-impact-on-gender-equality>.

The focus countries surveyed comprise five of the top 15 countries with the greatest overall climate hazard risks globally, with Myanmar, Philippines, Vietnam, and Bangladesh occupying the second, fourth, sixth, and seventh places. Bangladesh, Fiji, Myanmar, the Philippines, and Vietnam are very or extremely exposed to climate hazards; and Indonesia is highly exposed to climate hazards. Refer to [Table 1](#) for a summary of important indicators for all Indo-Pacific countries.

Existing Risk Factor 3: Susceptibility to Climate Hazards

A region's susceptibility to climate hazards is determined by the tendency of climate-exposed vital elements to suffer loss, damage, or other adverse effects because of climate hazards, and is often determined by socially-constructed elements such as government stability.²⁹ There is a cause and effect relationship at work since susceptibility to climate-related hazards also affects a state's ability to recover from and maintain stability following crises. Socioeconomic factors, life expectancy, education levels, standard of living, employment levels, gender, development, and infrastructure, and state corruption all influence susceptibility levels. Again, [Table 1](#) has a summary of important indicators for all Indo-Pacific countries. Bangladesh, Fiji, and Myanmar are very or extremely susceptible to climate hazards; Philippines, Indonesia, and Vietnam are moderately susceptible to climate hazards.

EXISTING AND EMERGING CLIMATE FACTORS

Gender is an important consideration when determining *who* to consult regarding changing environmental conditions that may increase state fragility and the potential for violence. Because of their roles in agriculture, as climate migrants, and as family members responsible for gathering water and fuel, women are often very attuned to climate conditions and may provide different and potentially more accurate reports than their male counterparts. The United Nations Food and Agriculture Organization (FAO) estimates that within Bangladesh, Bhutan, Cambodia, China, India, Myanmar, Nepal, Pakistan and Vietnam, women comprise between 60% and 98% of all agricultural workers. When combined with out-migration by men, women often take on sole responsibility for land caretaking.³⁰ They are therefore acutely aware of changes to soil quality and crop health, lengths of dry and rainy seasons, and, though they are frequently barred from land ownership, women are attuned to disagreements over land tenure. When consulted, women can provide early warnings of serious changes to agriculture systems which may trigger food insecurity and mass migrations.

According to the World Health Organization (WHO), women are traditionally responsible for collecting, storing, protecting, and distributing water and fuel for the family. This role makes women intimately aware of changes to the availability of water. Because of climate change, women and girls are also walking farther to gather water and fuel as droughts and water scarcity increase, giving them firsthand knowledge of environmental conditions outside of their communities that may impact community stability.³¹ In Nepal, a women's group in Mugu and Mangri villages provided previously undocumented information on landslide activity in the region and vital information on the state of drinking water facilities. This information was used to help build a new drinking water facility and a

²⁹ Remmits, Dick, and Rademaker, "Climate Security Assessment," 27.

³⁰ UN Food and Agriculture Organization, "Agriculture, Trade Negotiations and Gender," 2011, <https://www.fao.org/3/a0493e/a0493e03.htm>.

³¹ United Nations Environment Programme, *Women at the Frontline of Climate Change: Gender Risks and Hopes* (UNEP, 2011), <https://wedocs.unep.org/xmlui/handle/20.500.11822/7985>.

canal that powers a watermill to replace one destroyed by a landslide.³² Moreover, given women's relationship to the land, many have already adapted to changing weather patterns and possess specialized knowledge of how to increase resilience in a changing environment.³³

While men should be consulted, ensuring women are *always* consulted regarding climate risks and hazards could provide otherwise undiscovered unique gender-based knowledge such as that described here—knowledge which may be crucial to better disaster preparedness. Chad M. Briggs and Miriam Matejova, disaster security consultants for the US Department of Defense, have suggested that intelligence gathering for risk assessment purposes in the following areas is crucial: preliminary hazards analysis, failure mode and effect analysis, human reliability analysis, and probabilistic risk assessment—excluding women from data gathering in these areas would be a strategic oversight.³⁴

Women's power in decision making spaces can be measured in a variety of ways. For this report, the Gender Development Index (GDI) and the Human Development Index (HDI) comparing female to male progress are used. These indices track factors such as women's participation in parliament and government ministerial roles, women's labor force participation and leadership roles in professional spaces, as well as women's legal rights in terms of land ownership, holding a bank account, and inheriting wealth. When a country's rank on these indices is low, it likely indicates that women are excluded from important climate change and security planning and strategizing circles.

A Note on Certainty

Attribution science is a new type of research that seeks to determine whether an extreme weather event is either more severe or more likely to have occurred because of climate change. This type of research has made significant progress in recent years, yet the scientific community still requires high degrees of confidence when assessing extreme event attribution.³⁵ For scientists who contribute to reports for the UN Intergovernmental Panel on Climate Change (IPCC) or the US Department of Energy, a judgement of “very likely” indicates a 90-99% confidence level and 99-100% indicates virtual certainty (but never ‘proven’); research on the attribution of extreme events that does not meet this standard is typically reported as inconclusive.³⁶ Doubt is essential to science since the challenging of hypotheses advances knowledge. Though certainty is rarely attained in attribution science, due to the maturation of attribution science, “very likely” findings have become much more common, indicating a very strong consensus among climate scientists about the likelihood of present and future climate risks. With the preponderance of climate evidence outlined in the following pages in mind, and higher levels of confidence than in years past, this report is written on the understanding that climate change will lead to increased extreme weather events in many parts of the Indo-Pacific in the next 10 years,

³² Joint Submission by Asia Pacific Forum on Women, Law and Development (APWLD) and Landesa, “Gender-Responsive Climate Policy with a Focus on Adaptation and Capacity-Building, and Training for Delegates on Gender Issues – SBI 44” (UN Climate Change, February 2016), 4, https://unfccc.int/files/documentation/submissions_from_non-party_stakeholders/application/pdf/550.pdf.

³³ Joint Submission by Asia Pacific Forum on Women, Law and Development (APWLD) and Landesa, “Gender-Responsive Climate Policy with a Focus on Adaptation and Capacity-Building, and Training for Delegates on Gender Issues – SBI 44,” 2.

³⁴ Chad M. Briggs and Miriam Matejova, *Disaster Security: Using Intelligence and Military Planning for Energy and Environmental Risks*, 1st edition (Cambridge University Press, 2019), 23.

³⁵ Elisabeth A. Lloyd et al., “Climate Scientists Set the Bar of Proof Too High,” *Climatic Change* 165, no. 3 (April 19, 2021): 55, <https://doi.org/10.1007/s10584-021-03061-9>.

³⁶ Lloyd et al., “Climate Scientists Set the Bar of Proof Too High.”

with sudden climate-related disasters becoming increasingly common.³⁷ Further, the following extreme weather events have been ranked according to two combined metrics: 1) confidence in attribution to anthropogenic climate change (highest to lowest) and 2) understanding of effect of climate change on event (highest to lowest):³⁸

1. Extreme cold
2. Extreme heat
3. Drought
4. Extreme rainfall
5. Extreme snow & ice
6. Tropical cyclones
7. Extra-tropical cyclones
8. Wildfires
9. Severe convective storms

Existing Climate Factor 4: Hazards

Climate hazards such as those listed above are natural, physical phenomenon or trends that may generate adverse consequences for fragile, exposed, and susceptible vital elements of a region.³⁹ Hazards in and of themselves do not generally cause conflict; when they impact weak or fragile systems, however, hazards can develop into disasters and can combine with other factors to create conditions that increase violence and conflict. The severity of climate hazards in a country will impact the state's ability to recover and maintain political stability.

Bangladesh, Fiji, Myanmar, the Philippines, and Vietnam face extremely high climate hazards and Indonesia faces moderately high climate hazards.

Emerging Climate Factor 5: Disaster Risks

A country's vulnerability to climate disasters is a function of coping capacity and resilience or adaptive capacity. A region's coping capacity is determined by the capacity of its vital elements to recover from climate shocks in efficient and timely ways. A region's resilience or adaptive capacity refers to the ability of its vital elements to adapt to climate risks, anticipate hazards, and prevent disasters.⁴⁰ Climate disasters will intensify existing vulnerabilities in countries without adequate adaptation plans or funding to support those plans.⁴¹

Of the developing countries in the Indo-Pacific region, the following have begun the process of climate National Action Plans (NAPs) approval by the UN Green Climate Fund (GCF): Bangladesh, Bhutan, Cambodia, Kiribati, Lao People's Democratic Republic, Myanmar, Nepal, Timor-Leste,

³⁷ Dhanasree Jayaram and Climate Security Expert Network, "Climate-Fragility Risk Brief: South Asia" (Berlin, Germany: Climate Security Expert Network, 2019), 7, https://climate-security-expert-network.org/sites/climate-security-expert-network.org/files/documents/csen_climate_fragility_risk_brief_south_asia.pdf.

³⁸ Committee on Extreme Weather Events and Climate Change Attribution et al., *Attribution of Extreme Weather Events in the Context of Climate Change* (Washington, D.C.: National Academies Press, 2016), 100, <https://doi.org/10.17226/21852>.

³⁹ Remmits, Dick, and Rademaker, "Climate Security Assessment," 24.

⁴⁰ Remmits, Dick, and Rademaker, "Climate Security Assessment," 26.

⁴¹ Jeetendra Prakash Aryal et al., "Climate Change and Agriculture in South Asia: Adaptation Options in Smallholder Production Systems," *Environment, Development and Sustainability* 22, no. 6 (August 1, 2020): 5045–75, <https://doi.org/10.1007/s10668-019-00414-4>.

Tuvalu, Vanuatu.⁴² Those countries with approved plans can access the world’s largest climate fund for implementation of their Nationally Determined Contributions (NDCs) and build resilience against the worst climate impacts. Those without are likely at greater risk of climate disasters.

Bangladesh, Fiji, Myanmar, and Vietnam have insufficiently-developed climate adaptation plans that lack full funding, while Indonesia and the Philippines have somewhat-developed climate adaptation plans but insufficient funding and monitoring. In general, the region, including all our focus countries, lacks sufficient institutional, policy, and insurance structures to support adaptation, especially for poor and rural workers and farmers.⁴³

FOCUS COUNTRIES’ EXISTING FRAGILITIES, EXPOSURES, SUSCEPTIBILITIES, CLIMATE HAZARD RISKS, CLIMATE DISASTER RISKS, AND GENDER INEQUALITIES

Bangladesh

Bangladesh’s overall compound gender-climate-fragility risk is <i>extremely vulnerable</i> (see Table 1).	
Fragile States Index	<ul style="list-style-type: none"> ▪ 85 Score ▪ 39th most fragile, in bottom quartile ▪ Points 10-Year Change is -9.4
Gender	<ul style="list-style-type: none"> ▪ 133th lowest GII Rank (of 162 countries) ▪ 0.596 HDI Female vs 0.660 HDI Male
Exposure (Climate Risk Index)	<ul style="list-style-type: none"> ▪ 7th most exposed (of 181 countries)
Susceptibility (ND-GAIN Index)	<ul style="list-style-type: none"> ▪ 163rd lowest in exposure, sensitivity, and capacity to adapt (of 182 countries)
Climate Hazard Risk	<ul style="list-style-type: none"> ▪ Highest tropical storm security risk. ▪ 7th most climate-impacted country between 1999-2018 in terms of historical extreme weather events. ▪ One of seven countries globally with the highest riverine / coastal flood risks. ▪ 10th highest landslide risk globally. ▪ 13th highest heatwave risk globally. ▪ 15th highest drought risk globally.
Climate Disaster Risk	<ul style="list-style-type: none"> ▪ Significant gaps in government preparedness

⁴² “Expanded Details on the Table in Document FCCC/SBI/2020/INF.13: Progress in the Process to Formulate and Implement National Adaptation Plans. Note by the Secretariat” (Glasgow Climate Change Conference - 2021, UN FCCC, 2020), <https://unfccc.int/sites/default/files/resource/Expanded-details-on-the-table-in-document-FCCC-SBI-2020-INF.13.pdf>.

⁴³ Aryal et al., “Climate Change and Agriculture in South Asia.”

Fragility: The country is in the bottom quartile of countries on the Fragile States Index. It has experienced downward trends in social cohesion, economic stability, and political health.⁴⁴ Overall, Bangladesh is highly vulnerable to instability.

Exposure: Recorded 0.90 ± 0.41 °C temperature increase since 1960, could see more Days with Heat Index $>35^{\circ}\text{C}$ and Number of Very Hot Days ($T_{\text{max}}>35^{\circ}$) by 2099 (see [Table 2](#)). Warmer sea surface temperatures and more intense El Nino events in the Bay of Bengal have been linked to increased cholera outbreaks which could lead to health disasters.⁴⁵ The country ranks seventh on the Climate Risk Index (see F1 on [Table 1](#)). Therefore, Bangladesh is considered extremely exposed to climate risks.

Susceptibility: Bangladesh ranks 163 of 182 countries on the ND-GAIN Country Index, suggesting it is extremely susceptible to climate hazards. Housing conditions need to be improved for large populations living in climate-vulnerable zones; better monitoring of migration (internal and external) and improved disease surveillance and monitoring systems are required to reduce susceptibility to climate crises.⁴⁶

Climate Hazard Risks: Bangladesh is seventh highest on the Climate Risk Index. It is extremely vulnerable to climate hazards and climate change is likely to become a significant destabilizing factor within the next 10-25 years. Agriculture and manufacturing are leading contributors to the country's GDP. Coastal areas are heavily populated and are already experiencing displacement and disaster due to riverine and coastal flooding.⁴⁷ There is a need for better socioeconomic data collection on vulnerabilities and resilience related to climate change.⁴⁸

Climate Disaster Risks: Bangladesh lacks sufficient government and societal structures to prevent climate disasters. The country adopted the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in 2009, but it has been under-resourced and many of its policies and strategies have not been implemented.⁴⁹ It has launched the Agriculture and Food Security, Coastal Zones and Marine Ecosystems, Water and Energy, and Public Health initiative and the Hyogo Framework for Action (HFA) which prioritizes disaster resilience for vulnerable communities. In addition to several other multilateral-supported initiatives, Bangladesh also recently established two funds: Bangladesh Climate Change Trust Fund (BCCTF) with governmental budget funding and the Bangladesh Climate Change Resilient Fund (BCCRF) with multilateral development funding.⁵⁰ However, the World Bank notes gaps in public awareness; services for remote, inaccessible areas; insufficient government capacity for climate adaptation and carbon financing; and a lack of planning for addressing climate refugees.⁵¹

⁴⁴ "Country Dashboard," Fragile States Index, accessed July 30, 2021, <https://fragilestatesindex.org/country-data/>.

⁴⁵ Jayaram and Network, "Climate-Fragility Risk Brief: South Asia," 7.

⁴⁶ "Bangladesh Adaptation," World Bank Climate Change Knowledge Portal, accessed July 30, 2021, <https://climateknowledgeportal.worldbank.org/country/bangladesh/adaptation>.

⁴⁷ "Bangladesh: Climate Risk Country Profile" (The World Bank, 2011), 10, https://climateknowledgeportal.worldbank.org/sites/default/files/2018-10/wb_gfdr气候_change_country_profile_for_BGD.pdf.

⁴⁸ "Bangladesh Adaptation."

⁴⁹ Jayaram and Network, "Climate-Fragility Risk Brief: South Asia," 14.

⁵⁰ "Bangladesh: Climate Risk Country Profile."

⁵¹ "Bangladesh Adaptation."

Gender: On the GII, Bangladesh ranks 133 of 162 countries with a score of 0.537, putting it near the bottom of all ranked countries. The Female HDI score of 0.596 is substantially lower than the Male HDI of 0.660. According to the Global Gender Gap Report, Bangladesh’s rank has recently declined owing to decreases in almost all subindexes of the report, but in particular because of decreases in women’s economic participation and opportunities, especially in technical and professional work. Women’s share of skilled and managerial roles has shrunk, as has overall labor force participation—only 38.5% of women participate in the formal economy compared to 84.2% of men, while 96.6% of women participate in some way in the informal economy (compared to 93.9% of men). Women also earn only 40.3% of that earned by men. All these factors contribute to employment and income instability for women. While Bangladesh ranks high for number of years with a woman head of state, only 20.9% of parliamentarians and 7.7% of ministers are women. Women also lag in tertiary education and overall health, and experience high levels of SGBV. Importantly, women do not have equal rights under the law, in particular in matters of inheritance, access to land and other assets, and ability to divorce.⁵² Combined, these gender metrics diminish the country’s resilience against shocks such as climate disasters and conflict, and indicate women’s general exclusion from decision making bodies and roles.

Fiji

Fiji’s overall compound gender-climate-fragility risk is highly vulnerable (see Table 1).	
Fragile States Index	<ul style="list-style-type: none"> ▪ 70.4 Score ▪ 88th most fragile, in the bottom half ▪ Points 10-Year Change is -10.7
Gender	<ul style="list-style-type: none"> ▪ 84th on GII Rank (of 162 countries) ▪ HDI Female vs Male numbers not available
Exposure (Climate Risk Index)	<ul style="list-style-type: none"> ▪ 13th most exposed (of 181 countries)
Susceptibility (ND-GAIN Index)	<ul style="list-style-type: none"> ▪ 77th lowest in exposure, sensitivity, and capacity to adapt (of 182 countries)
Climate Hazard Risk	<ul style="list-style-type: none"> ▪ Greatest climate hazard is sea level rise which has already impacted the country; it has recorded sea level rises of 6 mm (0.2 inches) annually since 1993. ▪ Typically has extremely high exposure to tropical cyclones; climate change is expected to interact with cyclone hazards in complex ways that could impact storm surges, sea level rise, and increased precipitation intensity and wind speeds.
Climate Disaster Risk	<ul style="list-style-type: none"> ▪ Significant gaps in data and in government preparedness

⁵² “Global Gender Gap Report 2021” (Geneva: World Economic Forum, March 2021), 36, https://www3.weforum.org/docs/WEF_GGGR_2021.pdf.

Fragility/Gender Equity: The country ranks in the bottom half of countries on the Fragile States Index. It has experienced downward trends in social cohesion and political health.⁵³ Overall, Fiji is moderately vulnerable to instability.

Exposure: The country has recorded a 1.30 ± 0.44 °C temperature increase since 1960 (see [Table 1](#)), but is not projected to experience significant changes to temperatures compared to projected global average increases,⁵⁴ nor is it expected to experience significant changes in precipitation.⁵⁵ However, due to sea level rise risks and their consequences, the country is ranked 13th highest on the Climate Risk Index (see [Table 1](#)), and is considered very exposed to climate risks.

Susceptibility: Fiji ranks 77 of 182 countries on the ND-GAIN Country Index, suggesting it is moderately susceptible to climate hazards. Some Fijian villages have already been relocated due to sea level rise, with many more threatened.⁵⁶

Climate Hazard Risks: Fiji is 13th highest on the Climate Risk Index. The country is extremely vulnerable to climate hazards, and climate change is expected to become a moderate destabilizing factor within the next 10-25 years.

Cyclones frequently result in economic damage that has hindered growth. Flooding is increasingly impacting GDP, with estimated 2.6% fluvial (river flooding) and 1.6% pluvial (surface flooding) annual losses. The Fijian government estimates 12.5% of the population is pushed into poverty with every 100-year river flood.⁵⁷

Climate Disaster Risks: The country lacks sufficient government and societal structures to prevent climate disasters. Fiji has a National Adaptation Plan Framework (2017),⁵⁸ but, there is insufficient information on economic sectors, as well as little aerial mapping that would be useful for monitoring agro-forestry, sea level, and storm surge. Additionally, there is a lack of reporting on the scale of flood risk; minimal government capacity; and a lack of public and government decision maker education on climate change, leading to significant gaps in master planning for disasters, sanitation, water, and power.⁵⁹

Gender: On the GII, Fiji ranks 84 out of 162 countries with a score of 0.359, putting it in the middle of the global ranking system. Patriarchal norms and practices are still strong in Fiji where women are frequently excluded from decision making and formal planning. Though men and women are afforded most of the same rights under formal law, customary laws and traditions hold women back. Women lag behind men in political leadership, technical work, and managerial positions, with some traditional

⁵³ “Country Dashboard.”

⁵⁴ “Fiji: World Bank Climate Change Knowledge Portal,” accessed July 29, 2021, <https://climateknowledgeportal.worldbank.org/country/fiji>.

⁵⁵ “Fiji: World Bank Climate Change Knowledge Portal.”

⁵⁶ “Fiji Adaptation,” World Bank Climate Change Knowledge Portal, accessed July 30, 2021, <https://climateknowledgeportal.worldbank.org/country/fiji/adaptation>.

⁵⁷ “Fiji Vulnerability,” World Bank Climate Change Knowledge Portal, accessed July 30, 2021, <https://climateknowledgeportal.worldbank.org/country/fiji/vulnerability>.

⁵⁸ “Republic of Fiji National Adaptation Plan: A Pathway towards Climate Resilience” (Suva, Fiji: Government of the Republic of Fiji, 2018),

https://www4.unfccc.int/sites/NAPC/Documents/Parties/National%20Adaptation%20Plan_Fiji.pdf.

⁵⁹ “Fiji Adaptation.”

practices prohibiting women from holding higher paying jobs. Discriminatory customary laws also prevent women from holding land titles and accessing loans. SGBV is high, with 64% of all women who have ever been in an intimate relationship reporting at least one experience with physical or sexual violence.⁶⁰ Given these statistics, Fiji’s resilience continues to be weaker than it could be were women allowed more meaningful involvement in all levels of society.

NB: Fiji has not provided consistent reports for indices such as the Global Gender Gap Report and others, making it more challenging to track their progress over time.⁶¹

Indonesia

Indonesia’s overall compound gender-climate-fragility risk is <i>moderately vulnerable</i> (see Table 1).	
Fragile States Index	<ul style="list-style-type: none"> ▪ 67.6 Score ▪ 99th most fragile, in third quartile from the bottom ▪ Points 10-Year Change is -14
Gender	<ul style="list-style-type: none"> ▪ 121st GII Rank (of 162 countries) ▪ 0.694 HDI Female vs 0.738 HDI Male
Exposure (Climate Risk Index)	<ul style="list-style-type: none"> ▪ 77th most exposed (of 181 countries)
Susceptibility (ND-GAIN Index)	<ul style="list-style-type: none"> ▪ 77th lowest in exposure, sensitivity, and capacity to adapt (of 182 countries)
Climate Hazard Risk	<ul style="list-style-type: none"> ▪ Highest risk of wildfire. ▪ 2nd highest riverine and coastal flood risks globally. ▪ 2nd highest landslide risk globally.
Climate Disaster Risk	<ul style="list-style-type: none"> ▪ Noticeable gaps in government preparedness

Fragility: The country is in the third quartile of countries on the Fragile States Index having experienced downward trends in economic stability and political health.⁶² Overall, Indonesia is somewhat (increasingly) vulnerable to instability.

Exposure: Recorded 1.21 ± 0.18 °C temperature increase since 1960, and could have 50 times more Days with Heat Index >35°C and Number of Very Hot Days (T_{max}>35°) by 2099 (see [Table 1](#)). Average Largest 5-day Cumulative Rainfall is expected to decrease while the Max Number of Consecutive Wet Days is expected to increase (see [Table 2](#)). Indonesia is moderately exposed to climate risks.

⁶⁰ “Fiji Country Plan Summary” (Pacific Women Shaping Pacific Development & the Australian Government, September 2020), 3, https://pacificwomen.org/wp-content/uploads/2019/01/Fiji-Country-Plan-Summary_Overview-of-all-activities_Aug-2020.pdf.

⁶¹ World Economic Forum, *Global Gender Gap Report 2017* (Geneva: World Economic Forum, 2017), 17.

⁶² “Country Dashboard.”

Susceptibility: Indonesia ranks 100 of 182 countries on the ND-GAIN Country Index, suggesting it is highly susceptible to climate hazards. Damage from natural and health disasters is creating increasing demands for public expenditures. Financing intended for development is often diverted to recovery. Better funding mechanisms are needed for climate disaster management.⁶³

Climate Hazard Risks: Indonesia is 77th on the Climate Risk Index but has extremely high climate risks for wildfires, flooding, and landslides (see F1 on [Table 1](#)). The country is moderately vulnerable to these climate hazards, and climate change is expected to become a significant destabilizing factor in the country within the next 10-25 years.

Approximately 40% of the population is at risk of multiple hazards, and the country is ranked 12th out of 35 countries with a high mortality risk that will have a significant impact on the economy. Climate change is expected to impact the population through decreased food security.⁶⁴ Heat stress is a particular threat to labor productivity, which will be exacerbated by the urban heat island (UHI) effect in large urban areas.⁶⁵

Climate Disaster Risks: The country lacks some of the government and societal structures needed to prevent climate disasters. Indonesia developed a National Adaptation Plan, which was launched in 2014, that provides guidance to local governments and ministries for mainstreaming climate change adaptation into development and sectoral planning.⁶⁶ The National Medium-Term Development Plan 2020-2024 is the most recent government initiative for addressing climate change. The country also has reports on managing peatlands, forests, renewable energy, and technology related to global warming. The World Bank notes that Indonesia needs better policies for managing land use, forestry, improving forecasting, and enhancing resilience-building measures.⁶⁷

Gender: On the GII, Indonesia ranks 121 of 162 countries with a score of 0.480, putting it near the bottom of all countries. The Female HDI score of 0.694 is substantially lower than the Male HDI of 0.738. The Global Gender Gap Report recorded a decline for Indonesia in 2021 due to lower economic participation and opportunity gaps for women. Women's share of senior roles dropped from 54.9% to 29.8% in just one year, and women continue to be behind men in labor force participation at 55.9% compared to 84% for men, with 81.8% of women participating in the informal sector. While the percentage of women parliamentarians increased over the past year, the number of women in ministerial positions decreased by a greater percentage. The gap between men and women on health, survival, and educational attainment has shrunk significantly, although the enrolment rate of girls in primary education is the third-lowest among G20 countries.⁶⁸ Though Indonesia is doing somewhat better than its peers in this report, its remaining gender gaps and the exclusion of women within decision making circles are diminishing its ability to address the rising threats of climate hazards.

⁶³ "Indonesia Adaptation," World Bank Climate Change Knowledge Portal, accessed July 30, 2021, <https://climateknowledgeportal.worldbank.org/country/indonesia/adaptation>.

⁶⁴ "Indonesia Adaptation."

⁶⁵ "Indonesia: Climate Risk Country Profile" (The World Bank and Asian Development Bank, 2021), 22, https://climateknowledgeportal.worldbank.org/sites/default/files/2021-05/15504-Indonesia%20Country%20Profile-WEB_0.pdf.

⁶⁶ "National Adaptation Plan" (Jakarta, Indonesia: Ministry of National Development Planning, December 2019), <https://lcdi-indonesia.id/wp-content/uploads/2020/05/Executive-Summary-NAP.pdf>.

⁶⁷ "Indonesia: Climate Risk Country Profile," 28.

⁶⁸ "Global Gender Gap Report 2021," 37.

Myanmar

Myanmar’s overall compound gender-climate-fragility risk is <i>extremely vulnerable</i> (see Table 1).	
Fragile States Index	<ul style="list-style-type: none"> ▪ 93.8 Score ▪ 23rd most fragile, in bottom octile ▪ Points 10-Year Change is -4.5
Gender	<ul style="list-style-type: none"> ▪ 118th GII Rank (of 162 countries) ▪ 0.564 HDI Female vs 0.592 HDI Male
Exposure (Climate Risk Index)	<ul style="list-style-type: none"> ▪ 2nd most exposed (of 181 countries)
Susceptibility (ND-GAIN Index)	<ul style="list-style-type: none"> ▪ 161st lowest in exposure, sensitivity, and capacity to adapt (of 182 countries)
Climate Hazard Risk	<ul style="list-style-type: none"> ▪ 2nd most climate-impacted country between 1999-2018 in terms of historical extreme weather events. ▪ Average temperatures are expected to increase and erratic rainfall patterns will become more variable, frequent, and intense, leading to more extreme weather events. ▪ Sea level rise is an acute vulnerability, which will result in saltwater intrusion, more intense rainfalls, flooding, and shorter monsoons. Sea level rise will also destroy mangroves that protect the country from storm surges.
Climate Disaster Risk	<ul style="list-style-type: none"> ▪ Significant gaps in government preparedness

Fragility: Myanmar is in the bottom octile of countries on the Fragile States Index. The country has experienced significant downward trends in economic stability, political health.⁶⁹ Overall, Myanmar is extremely vulnerable to instability.

Exposure: Recorded 0.99 ± 0.30 °C temperature increase since 1960, could potentially more than quadruple the number of Days with Heat Index >35°C and Number of Very Hot Days (T_{max}>35°), and Days with Precipitation >20mm are expected to decrease by 2099 (see Table 2). Ranking second highest on the Climate Risk Index (see F1 on Table 1), Myanmar is extremely exposed to climate risks.

Susceptibility: Myanmar ranks 161 of 182 countries on the ND-GAIN Country Index, suggesting that it is extremely susceptible to climate hazards. Severe droughts have diminished village water sources throughout Myanmar in recent years, and insecure housing in many regions puts millions at risk in

⁶⁹ “Country Dashboard.”

times of flooding and record-breaking rainfall.⁷⁰ A lack of data makes it difficult to assess the country's susceptibility to climate risks.

Climate Hazard Risks: Myanmar is second highest for overall climate risk on the Climate Risk Index. It is extremely vulnerable to climate hazards, and climate change is likely to become a significant destabilizing factor in the country within the next 10-25 years. Significant droughts have resulted in substantial crop failures. Much more data is required to assess the anticipated economic impacts of climate change for Myanmar.⁷¹

Climate Disaster Risks: The country lacks sufficient government and societal structures to prevent climate disasters. While the National Action Plan for climate change prioritizes agriculture, early warning systems, forests, public health, water resources, coastal zones, energy and industry, and biodiversity, corruption is rampant and very little additional planning has been done to bolster Myanmar's resilience against climate disasters.⁷²

Gender: On the GII, Myanmar ranks 118 of 162 countries with a score of 0.478, putting it near the bottom of all countries. The Female HDI score of 0.564 is substantially lower than the Male HDI of 0.592. In economic terms, women significantly lag Burmese men, with a labor force participation rate of 50.2% (compared to 80% for men), and a female to male income ratio of 0.56, and the fact that 86.4% of women work in the informal sector. Women do slightly better in Myanmar in terms of top management roles, holding 41.1% of those positions (compared to 58.9% men). Discriminatory practices mean that women have fewer legal rights to inheritance and land and asset control. In politics, women make up only 15.3% of parliamentarians and hold only 4% of ministerial positions. However, women are doing better in terms of educational attainment, with 22% achieving the tertiary level (compared to 15.6% of men).⁷³ Combined, these factors indicate women's exclusion from many important aspects of the country's management, which will continue to increase Myanmar's vulnerability to climate hazards.

⁷⁰ "Myanmar (Burma) Vulnerability," World Bank Climate Change Knowledge Portal, accessed July 30, 2021, <https://climateknowledgeportal.worldbank.org/country/myanmar-burma/vulnerability>.

⁷¹ "Myanmar (Burma) Adaptation," World Bank Climate Change Knowledge Portal, accessed July 30, 2021, <https://climateknowledgeportal.worldbank.org/country/myanmar-burma/adaptation>.

⁷² "Myanmar (Burma) Adaptation."

⁷³ "Global Gender Gap Report 2021," 290.

Philippines

The Philippines' overall compound gender-climate-fragility risk is <i>highly vulnerable</i> (see Table 1).	
Fragile States Index	<ul style="list-style-type: none"> ▪ 82.4 Score ▪ 49th most fragile, in bottom third ▪ Points 10-Year Change is -2.6
Gender	<ul style="list-style-type: none"> ▪ 104th GII Rank (of 162 countries) ▪ 0.720 HDI Female vs 0.715 HDI Male
Exposure (Climate Risk Index)	<ul style="list-style-type: none"> ▪ 4th most exposed (of 181 countries)
Susceptibility (ND-GAIN Index)	<ul style="list-style-type: none"> ▪ 117th lowest in exposure, sensitivity, and capacity to adapt ▪ (of 182 countries)
Climate Hazard Risk	<ul style="list-style-type: none"> ▪ 4th most climate-impacted country between 1999-2018 in terms of historical extreme weather events. ▪ 2nd highest tropical storm security risk. ▪ 6th highest coastal flood risks and ninth highest riverine flooding risks globally. ▪ 7th highest landslide security risk.
Climate Disaster Risk	<ul style="list-style-type: none"> ▪ Noticeable gaps in government preparedness

Fragility: The Philippines ranks in the bottom third of countries on the Fragile States Index. The country has experienced downward trends in economic stability and political health.⁷⁴ Overall, the Philippines is very vulnerable to instability.

Exposure: Recorded 0.97 ± 0.27 °C temperature increase since 1960 and could have 100 times more Days with Heat Index >35°C by 2099 (see Table 2). The country is ranked fourth highest for overall climate risk on the Climate Risk Index (see F1 on Table 1), and is considered extremely exposed to climate risks.

Susceptibility: The Philippines ranks 117 of 182 countries on the ND-GAIN Country Index, suggesting it is highly susceptible to climate hazards. Sewers and waterways are prone to clogging during high rainfalls, which increases flood risks and significant infrastructure damage. The El Niño Southern Oscillation combined with climate change has a tendency to intensify droughts, which leads to food shortages and price fluctuations, as well as GDP losses.⁷⁵

⁷⁴ “Country Dashboard.”

⁷⁵ “Philippines Vulnerability,” World Bank Climate Change Knowledge Portal, accessed July 30, 2021, <https://climateknowledgeportal.worldbank.org/>.

Climate Hazard Risks: The Philippines is fourth highest for overall climate risk on the Climate Risk Index. An estimated 60% of land area and 74% of population are exposed to multiple hazards annually,⁷⁶ making the Philippines is extreme vulnerability to these climate hazards. Climate change is likely to become a slight destabilizing factor within the next 10-25 years.

More than 33% of the population relies on agriculture, forestry, and fishing for their livelihood and basic food staples, sectors which also contribute significantly to GDP. Coastal ecosystems also add to the country's economic production.⁷⁷

Climate Disaster Risks: The Philippines lacks some of the government and societal structures needed to prevent climate disasters. Coordination and evaluation of climate change programs and policies are conducted through the National Disaster Risk Reduction and Management Council and the Climate Change Commission officiated with the President's Office. The Commission oversees Local Climate Change Action Plans and the formulation of a National Framework Strategy on Climate Change. The Philippines aims to improve resilience of agriculture, drinking water, ecosystems, human health, and fisheries through the 2011 Climate Change Action Plan.⁷⁸ The World Bank notes that the country needs to do more to strengthen planning, execution, and financing of climate mitigation programs, enhance leadership and accountability by increasing monitoring and evaluation, and build the country's climate management capacity.⁷⁹ Additionally, systems for pumping floodwaters, improved land planning and zoning, and coordination of agencies for disaster risk management are needed to improve resilience against disasters through early warning systems, hazard mapping, and risk sharing mechanisms.⁸⁰

Gender: On the GII, the Philippines ranks 104 of 162 countries with a score of 0.430, putting it in the bottom third of all ranked countries. The Female HDI score is 0.720 while the Male HDI is 0.715, making it the only country in our sample to have a higher Female to Male HDI ratio. Women's labor force participation is still relatively low at 49.1%, and there remains a 31% income gap between men and women. Likewise, women still lag men in government leadership, holding only 28% of parliamentary seats and 13% of ministerial positions. Nevertheless, the Philippines has done a lot to shrink the gender gap in educational attainment, health and survival, as well as economic participation and work opportunities.⁸¹ Women's exclusion from important climate risk planning and combined increase Philippine vulnerability to climate hazards, though less so than other countries in the region.

⁷⁶ "Philippines: Climate Risk Country Profile" (The World Bank, 2011), 6, https://climateknowledgeportal.worldbank.org/sites/default/files/2018-10/wb_gfdrr_climate_change_country_profile_for_PHL.pdf.

⁷⁷ "Getting a Grip on Climate Change in the Philippines" (Washington, D.C., June 2013), <https://openknowledge.worldbank.org/handle/10986/16543>.

⁷⁸ "Philippines: Climate Risk Country Profile."

⁷⁹ "Getting a Grip on Climate Change in the Philippines."

⁸⁰ "Philippines: Climate Risk Country Profile," 12.

⁸¹ "Global Gender Gap Report 2021," 38.

Vietnam

Vietnam’s overall compound gender-climate-fragility risk is <i>moderately vulnerable</i> (see Table 1).	
Fragile States Index	<ul style="list-style-type: none"> ▪ 63.3 Score ▪ 114th most fragile, in third quartile from the bottom ▪ Points 10-Year Change is -12.8
Gender	<ul style="list-style-type: none"> ▪ 65th GII Rank (of 162 countries) ▪ 0.703 HDI Female vs 0.705 HDI Male
Exposure (Climate Risk Index)	<ul style="list-style-type: none"> ▪ 6th most exposed (of 181 countries)
Susceptibility (ND-GAIN Index)	<ul style="list-style-type: none"> ▪ 102nd lowest in exposure, sensitivity, and capacity to adapt (of 182 countries)
Climate Hazard Risk	<ul style="list-style-type: none"> ▪ 6th most impacted country between 1999-2018 in terms of historical extreme weather events. ▪ 3rd highest coastal flood risks and fourth highest riverine flooding risks globally. ▪ 3rd highest tropical storm security risk.
Climate Disaster Risk	<ul style="list-style-type: none"> ▪ Noticeable gaps in government preparedness

Fragility: Vietnam ranks in the third quartile of countries on the Fragile States Index. The country has experienced downward trends in economic stability and social health.⁸² Overall, Vietnam is slightly vulnerable to instability.

Exposure: Recorded 0.91 ± 0.27 °C since 1960, could see more than quadruple the number of Days with Heat Index > 35°C by 2099 (see [Table 2](#)) and Number of Very Hot Days ($T_{max} > 35^\circ$), and Max Number of Consecutive Dry Days is expected to decrease by 2099 (see [Table 2](#)). Vietnam is extremely exposed to climate risks.

Susceptibility: Vietnam ranks 102 of 182 countries on the ND-GAIN Country Index, suggesting it is very susceptible to climate hazards. Approximately one-third of the population is vulnerable to flooding, causing damage estimated to cost \$3.6 billion annually. Damage from typhoons is increasing, costing more than \$4.5 billion over the past century. The country lacks sufficient early warning systems and has a low level of household resilience to disasters.⁸³

⁸² “Country Dashboard.”

⁸³ “Vietnam Vulnerability,” World Bank Climate Change Knowledge Portal, accessed July 30, 2021, <https://climateknowledgeportal.worldbank.org/country/vietnam/vulnerability>.

Climate Hazard Risks: Vietnam is sixth highest on the Climate Risk Index because of its extreme vulnerability to climate hazards (see F1 on [Table 1](#)), and climate change is likely to become a moderate destabilizing factor in the country within the next 10-25 years.

Droughts in nine provinces impacting 13-17% of the population hinder agricultural production in regions that produce staple crops. Heat waves in some areas are expected to become chronic and may impact productivity. Improvements in aquafarming, coastal and marine management, and protections for fishing ships are also required to protect against climate shocks.⁸⁴

Climate Disaster Risks: The country lacks some of the government structures needed to prevent climate disasters. Vietnam has a National Strategy on Climate Change (2011), a Technology Needs Assessment for Climate Adaptation (2012), and a Law on Natural Disaster Prevention and Control (2013). They also have a Financing Vietnam’s Response to Climate Change plan. The World Bank assesses that Vietnam requires more proactive adaptation and disaster prevention, better coordination between emergency relief, damage recovery, and rehabilitation, and more stringent implementation of land use regulations.⁸⁵

Gender: On the GII, Vietnam ranks 65 of 162 countries with a score of 0.296, putting it in the top half of all countries. The Female HDI score of 0.703 is only slightly lower than the Male HDI of 0.705. Women hold few leadership positions in Vietnam; they occupy only 26.7% of parliamentary seats, there are no women ministers, and the country has never had a female head of state. In health and survival, there is a skewed sex ratio at birth, indicating a potentially high rate of sex selective abortions. In terms of economic participation and opportunity, women fare much better in Vietnam than other countries: women’s labor force participation is 79.6%, they hold 52.6% of skilled professional roles, and earn 81.9% of a man’s income. However, women hold few senior and managerial roles (26%) and even fewer top management positions (22.4%).⁸⁶ These gender gaps show that Vietnam still marginalizes women in leadership and decision making positions, decreasing the country’s resilience, though less so than many other countries studies in this report

RESULTING INSECURITIES AND POTENTIAL VIOLENCE

Traditional communities typically center men’s voices in matters of security and community resource management, ignoring women ’valuable, unique security intelligence. Understanding gender norms and roles may be instrumental for uncovering how climate-based conflicts are instigated and mitigated, detecting increases in state vulnerability to climate disasters, and intervening when such disasters generate violence. For instance, women could provide more and better intelligence about the impact of corruption. Traditional agricultural surveys done to understand food scarcity in Burundi based on the availability of fertilizer and road safety suggested all was well; it wasn’t until the women of farm families were interviewed that researchers discovered road safety patrollers were levying unofficial taxes on the women who were transporting agricultural goods. Women are often not consulted in

⁸⁴ “Vietnam Adaptation,” World Bank Climate Change Knowledge Portal, accessed July 30, 2021, <https://climateknowledgeportal.worldbank.org/country/vietnam/adaptation>.

⁸⁵ “Vietnam Adaptation.”

⁸⁶ “Global Gender Gap Report 2021,” 39.

security situations, but without this information it would be difficult for security personnel to devise strategies for maintaining stable food prices and avoiding potential food scarcity conflicts.⁸⁷

Research by Ide et al. suggests that gender can play an intervening role in climate-related conflicts.⁸⁸ For instance, in pastoral societies in Africa, violent, destructive, and increasingly frequent raiding of livestock has resulted from drought, limited access to water, poor pasture resources, and loss of livestock, and has been linked to inefficient use of resources, food insecurity, and out-migration.⁸⁹ Men often engage in cattle raiding and similar wealth-acquisition practices as a means of marking maturation into manhood, for maintaining their honor as a provider, or as a means of gaining wealth for the purposes of paying a bride price.⁹⁰ As climate change is expected to increase resource constraints that may disrupt men's gender roles, such practices are likely to increase conflict and violence.⁹¹ Additionally, historical events suggest that it's not just men participating in resource-based conflicts; women participate in civil wars as fighters and activists,⁹² and may even violently challenge patriarchal structures that limit their freedoms following crises.⁹³ These types of activism that may increase as natural disasters and resource constraints disrupt communities.

Climate change is expected to drive increases in migration and internal displacement and may increase conflict within migrant populations and between migrants and host populations,⁹⁴ and here too, a gender lens is important. The UN Development Programme estimates that currently 80% of all climate refugees are women,⁹⁵ and there are currently more than 10.3 million South Asian women are currently displaced or impacted by climate change.⁹⁶ Maintaining stability within migrant populations will be important for protecting women and girls who are often disproportionately impacted by conflict, and for preventing conflict between host and visitor populations. Moreover, excluding the majority of residents within these spaces could mean missing vital security intelligence. For instance, women can provide intelligence on why people migrate (potentially offering intelligence on broader climate migration trends in the region) and what may drive instability and conflict within such

⁸⁷ Jody M. Prescott, *Armed Conflict, Women and Climate Change* (London: Routledge, 2018), 248, <https://doi.org/10.4324/9781315467214>.

⁸⁸ Tobias Ide et al., "Gender in the Climate-Conflict Nexus: 'Forgotten' Variables, Alternative Securities, and Hidden Power Dimensions," *Politics and Governance* 9, no. 4 (October 22, 2021): 43–52.

⁸⁹ Janpeter Schilling, Francis EO Opiyo, and Jürgen Scheffran, "Raiding Pastoral Livelihoods: Motives and Effects of Violent Conflict in North-Western Kenya," *Pastoralism: Research, Policy and Practice* 2, no. 1 (December 3, 2012): 25, <https://doi.org/10.1186/2041-7136-2-25>.

⁹⁰ Kennedy Agade Mkuu, "Uganda: Pastoral Conflict & Gender Relations," *Review of African Political Economy* 35, no. 116, (2008): 237–54.

⁹¹ "Climate Change, Violent Conflict and Local Institutions in Kenya's Drylands - Wario R Adano, Ton Dietz, Karen Witsenburg, Fred Zaal, 2012," accessed November 18, 2021, <https://journals-sagepub-com.ezp-prod1.hul.harvard.edu/doi/full/10.1177/0022343311427344>.

⁹² "Young Female Fighters in African Wars: Conflict and Its Consequences," GSDRC, accessed November 18, 2021, <https://gsdrc.org/document-library/young-female-fighters-in-african-wars-conflict-and-its-consequences/>.

⁹³ Luna K.C. and Gemma Van Der Haar, "Living Maoist Gender Ideology: Experiences of Women Ex-Combatants in Nepal," *International Feminist Journal of Politics* 21, no. 3 (May 27, 2019): 434–53, <https://doi.org/10.1080/14616742.2018.1521296>.

⁹⁴ Guy J. Abel et al., "Climate, Conflict and Forced Migration," *Global Environmental Change* 54 (January 1, 2019): 239–49, <https://doi.org/10.1016/j.gloenvcha.2018.12.003>.

⁹⁵ "Gender and Climate Change | United Nations Development Programme" (United Nations Development Programme, September 20, 2017), <https://www.undp.org/publications/gender-and-climate-change>.

⁹⁶ Sara Rizvi Jafree and Bajiyanta Mukhopadhyay, "Refugee, Displaced, and Climate-Affected Women of South Asia and Their Health Challenges," in *The Sociology of South Asian Women's Health* (Cham: Springer International Publishing, 2020), 101–27, https://doi.org/10.1007/978-3-030-50204-1_6.

environments. Whether participating in the formal or informal economies within displaced persons camps, women can also report on the general economics of such spaces, including women’s labor force participation rates, human rights violations, levels of poverty and other indicators for determining fragility levels within these settlements. Women are often thrust into roles and activities outside of the home during climate crises and while migrating—such environments offer opportunities to change attitudes toward women’s roles and give them new opportunities to increase agency and decision making—all of which may improve refugee settlement resilience.⁹⁷

Data on SGBV is a valuable intelligence source for security agencies since, as previously mentioned, SGBV tends to increase in vulnerable states during times of crisis, and could be a critical indicator of increasing fragility rates.⁹⁸ Women and girls also face much higher rates of SGBV, survival prostitution, forced abortion, coercive control over contraception, and child marriage when internally displaced or migrating.⁹⁹ NATO noted that women can provide intelligence on “conflict-related sexual and gender-based violence to human trafficking, the movements of refugees, smuggling, changes in gender relations and roles caused by conflict”—all of which may indicate rises in violence and emerging conflict.¹⁰⁰

Gender is also an important consideration after climate-related conflicts break out. The Agenda on Women, Peace and Security (WPS), underpinned by United Nations Security Council Resolution 1325 (2000) and nine subsequent resolutions, is designed to increase women’s participation in all levels of security specifically, and society more broadly. Resultantly, the US adopted the US National Action Plan on WPS and has worked to integrate the WPS framework into all branches of national security strategies as a form of “smart power.”¹⁰¹ Meaningfully including women and their unique perspectives and needs in fragile, conflict, and post-conflict settings protects women and results in stronger peace agreements. Research by Best, Shair-Rosenfield, and Wood has shown that women’s leadership increased the likelihood that a conflict would end in a negotiated settlement.¹⁰² Nagel has shown that as gender equality in decision-making bodies increases, the likelihood of conducting peace negotiations with rebels also increases.¹⁰³ Caprioli and Boyer’s research demonstrates that when women are involved in peacebuilding, the severity of violence following international crises decreases.¹⁰⁴

⁹⁷ OECD, “Gender Equality and Women’s Empowerment in Fragile and Conflict-Affected Situations: A Review of Donor Support” (Paris: OECD, December 6, 2017), <https://doi.org/10.1787/b75a1229-en>.

⁹⁸ Emma Smith // 13 May 2020, “Why Focusing on Gender-Based Violence Is a Priority in a Crisis,” *Devex* (blog), May 13, 2020, <https://www.devex.com/news/sponsored/why-focusing-on-gender-based-violence-is-a-priority-in-a-crisis-97148>.

⁹⁹ Christelle Cazabat, “Hidden in Plain Sight: Women and Girls in Internal Displacement” (Internal Displacement Monitoring Centre, March 2020), 14, <https://www.internal-displacement.org/sites/default/files/publications/documents/202003-twice-invisible-internally-displaced-women.pdf>.

¹⁰⁰ Prescott, *Armed Conflict, Women and Climate Change*, 96.

¹⁰¹ United States White House, “U.S. National Action Plan on Women, Peace and Security” (2011), https://www.peacewomen.org/sites/default/files/us_nationalactionplan_2011.pdf.

¹⁰² Rebecca H. Best, Sarah Shair-Rosenfield, and Reed M. Wood, “Legislative Gender Diversity and the Resolution of Civil Conflict,” *Political Research Quarterly* 72, no. 1 (March 1, 2019): 215–28, <https://doi.org/10.1177/1065912918785459>.

¹⁰³ Robert Ulrich Nagel, “Gendered Preferences: How Women’s Inclusion in Society Shapes Negotiation Occurrence in Intrastate Conflicts,” *Journal of Peace Research*, July 13, 2020, 0022343319899456, <https://doi.org/10.1177/0022343319899456>.

¹⁰⁴ Mary Caprioli and Mark A. Boyer, “Gender, Violence, and International Crisis,” *Journal of Conflict Resolution* 45, no. 4 (August 1, 2001): 503–18, <https://doi.org/10.1177/0022002701045004005>.

As sources of security intelligence, as barometers of community resilience, and as peace negotiators, women and men both play important roles, but gender norms and practices must be better understood to prevent and minimize climate-related conflicts. The following sections consider in greater depth the ways in which all preceding factors within this gender-climate-security framework interact to produce violence and conflict in fragile settings.

Emerging Insecurity Factor 6: Structural Upheaval

Structural upheaval refers to the disruption of systems, resources, and infrastructure that support employment and peoples' livelihoods and vital services. As economic and political systems respond to climate hazards and disasters, inequalities may increase, which can disrupt political stability.¹⁰⁵ Climate change is likely to negatively impact Indo-Pacific economies, water, and food supplies, and these stressors may push fragile states such as the focus countries in this paper into political instability and violence. Additionally, government responses to climate change may exacerbate existing inequalities, including gender inequalities, which may deepen the conditions that fuel conflict and violence.

Economic Impacts of Climate Change. Climate change is expected to negatively impact economic systems in a multitude of ways. Disruptions in access to raw materials and finished products, that support a smooth functioning international system of trade, along with greater competition for jobs, resources, and land may increase local insecurities, and incidents of violence may turn episodic confrontations into revolts and civil wars.¹⁰⁶ These Indo-Pacific economic climate stressors may generate structural upheaval as illustrated by the following:

- Extreme heat waves are expected to severely hamper industries that require outdoor work, including construction, agriculture, and mining. By 2050, it is estimated that between \$2.8 trillion and \$4.7 trillion of GDP in Asia will be lost annually due to heat waves and high humidity which limits the strain the human body can handle.¹⁰⁷
- Riverine flooding, which will increase in frequency due to climate change, typically damages capital stock that supports economies; approximately \$1.2 trillion in annual capital stock losses are expected in Asia by 2050.¹⁰⁸
- Close to 2.7 million hectares of land are vulnerable to drought, with projected average economic losses of 9.4%.¹⁰⁹ The region is reliant on small-holder, rain-fed agriculture for food and individual livelihoods. Agriculture is the economic mainstay of more than 70% of South Asian populations and contributes to 22% of regional GDP.¹¹⁰

¹⁰⁵ Adelphi et al., "A New Climate for Peace: Taking Action on Climate and Fragility Risks, An Independent Report Commissioned by the G7 Members."

¹⁰⁶ Ellen Messer, "Climate Change and Violent Conflict," Research Backgrounders (Oxfam America, 2010), 5, <https://s3.amazonaws.com/oxfam-us/static/oa3/files/climate-change-and-violent-conflict.pdf>.

¹⁰⁷ "Climate Risk and Response in Asia," 7.

¹⁰⁸ "Climate Risk and Response in Asia," 8.

¹⁰⁹ Aryal et al., "Climate Change and Agriculture in South Asia."

¹¹⁰ SW Wang, WK Lee, and Son, Y, "An Assessment of Climate Change Impacts and Adaptation in South Asian Agriculture-Web of Science Core Collection," *International Journal of Climate Strategies and Management* 9, no. 4 (2017): 517–34.

Water Scarcity, Food Scarcity, & Price Volatilities. Populations in the Indo-Pacific are growing rapidly and moving into urban centers while industrializing.¹¹¹ These changes have stressed water, energy, and agricultural supplies to their limits, leaving little flexibility to absorb shocks.¹¹² Climate change is very likely to intensify food and water insecurities in the Indo-Pacific, leading to price increases that further exacerbate food insecurities. These resource scarcities may contribute to structural upheavals that lead to intra-state conflict. These Indo-Pacific situations related to water and food are already disrupting systems:

- Climate change has caused rapid deterioration of more than 35,000 glaciers in the Hindu Kush-Himalayan and Tibetan Plateau ranges of Asia. Collapse of some of these glaciers has sparked disasters. In February 2021, a deadly flood in northern India was set off by a Himalayan glacier breaking away, surging water into villages, likely killing more than 140 people and displacing many more. Scientists warn that glaciers are warming twice as fast as the rest of the planet. This will continue to generate significant human security risks for many regions of Asia since at least 10 of Asia's largest rivers rely on the Tibetan Plateau glacier for fresh water. The collapse of that glacier would put 1.35 billion people (20% of the global population) at risk of water shortages and potential conflict.¹¹³
- Climate change is disrupting the region's agriculture sector because of sea-level rise that increases soil and water salinity; increasing droughts resulting from glacial meltwater reductions; and increasing monsoons.¹¹⁴ Viable land for wheat production in the Indo-Gangetic Plains (IGP)—the food basket of South Asia—is expected to fall by almost half by 2050 with a modest 1.5–2 °C of warming.¹¹⁵
- Agriculture sector stress and resulting food shortages, combined with water scarcities, will cause fluctuations in crop production and market prices,¹¹⁶ though food system disruptions may be slightly less in Asia than the world as a whole.¹¹⁷ By 2050, food crop prices (i.e., rice, maize, soybean, wheat) are expected to rise 2.5 times and animal product prices 1.5 times above levels in 2000.¹¹⁸
- Further food system disruptions from climate change will intensify food crises. Increased extreme weather events such as flooding can destroy transport networks, resulting in food and market disruptions. Dramatic flooding in the Bangkok, Thailand in 2011 and into 2012 caused large-scale national food chain disruptions.¹¹⁹

¹¹¹ “AR5 Climate Change 2014: Impacts, Adaptation, and Vulnerability — IPCC” (Intergovernmental Panel on Climate Change, 2014), <https://www.ipcc.ch/report/ar5/wg2/>.

¹¹² Benjamin T Jones, Eleonora Mattiacci, and Bear F Braumoeller, “Food Scarcity and State Vulnerability: Unpacking the Link between Climate Variability and Violent Unrest,” *Journal of Peace Research* 54, no. 3 (2017): 335–50.

¹¹³ “Glacier Collapse in India a Worrying Sign of What’s to Come,” *UNEP* (blog), February 11, 2021, <http://www.unep.org/news-and-stories/story/glacier-collapse-india-worrying-sign-whats-come>.

¹¹⁴ Aryal et al., “Climate Change and Agriculture in South Asia.”

¹¹⁵ Aryal et al., “Climate Change and Agriculture in South Asia.”

¹¹⁶ Kira Vinke et al., “Climatic Risks and Impacts in South Asia: Extremes of Water Scarcity and Excess,” *Regional Environmental Change* 17, no. 6 (August 2017): 1576, <https://doi.org/10.1007/s10113-015-0924-9>.

¹¹⁷ “Climate Risk and Response in Asia,” 8.

¹¹⁸ Aryal et al., “Climate Change and Agriculture in South Asia.”

¹¹⁹ Adelphi et al., “A New Climate for Peace: Taking Action on Climate and Fragility Risks, An Independent Report Commissioned by the G7 Members,” 472.

Water scarcity and food insecurities can reinforce one another, compelling people to take to the streets in protest. These protests could be violent depending on local cultural inclinations and the severity of insecurities.¹²⁰ Food and water insecurity crises can trigger violence and intra-state conflicts by leading to:

- Rising food prices increase conflict rates and conflict rates increase food prices, creating negative feedback loops.¹²¹ Global food prices are positively correlated with increases in social unrest and violence, though the impact is more evident in democracies and anocracies (a semi-democracy with dictatorial features) than autocracies. Food price-related protests and riots have occurred in Bangladesh, India, the Philippines, Cambodia, and Thailand in 2007-08 and in Bangladesh, China, and India in 2010-11.¹²²
- Poor nutrition in adults, a problem likely to arise because of increased food insecurities, can reduce national security by distracting military personnel, decreasing military readiness,¹²³ making fewer individuals available for military service,¹²⁴ which will slow or halt national responses to any crises.

Unintended Consequences of Government Responses to Climate Change. Many regions in the Indo-Pacific lack the political systems needed to support well-functioning governments. As a result, it is very likely that Indo-Pacific countries will adopt climate policies that fuel conflict increases, including “green grabs”—the appropriation of resources and land, such as forest for preservation—to fight climate change. Even the United Nations’ (UN) Reducing Emissions from Deforestation and Forest Degradation (REDD+) program has been linked to reinforcement of existing social exclusions and inequities.¹²⁵ Climate change has spurred a demand for low-carbon fuels, including plant-based biofuels in Indonesia.¹²⁶ In parts of the country, land rights have been transferred from traditional landholders (who rely on the land for fishing, hunting, and collecting forest resources) to large-scale operations for palm oil production for use in biofuels. Loss of food and income has led to conflicts over land rights.¹²⁷

¹²⁰ Ore Koren, Benjamin E Bagozzi, and Thomas S Benson, “Food and Water Insecurity as Causes of Social Unrest: Evidence from Geolocated Twitter Data,” *Journal of Peace Research* 58, no. 1 (January 1, 2021): 67–82, <https://doi.org/10.1177/0022343320975091>.

¹²¹ Clionadh Raleigh, Hyun Jin Choi, and Dominic Kniveton, “The Devil Is in the Details: An Investigation of the Relationships between Conflict, Food Price and Climate across Africa,” *Global Environmental Change* 32 (May 2015): 187–99, <https://doi.org/10.1016/j.gloenvcha.2015.03.005>.

¹²² Cullen S Hendrix and Stephan Haggard, “Global Food Prices, Regime Type, and Urban Unrest in the Developing World,” *Journal of Peace Research* 52, no. 2 (March 1, 2015): 143–57, <https://doi.org/10.1177/0022343314561599>.

¹²³ Renee E. Cole et al., “Development and Validation of the Military Eating Behavior Survey,” *Journal of Nutrition Education and Behavior* 53, no. 9 (September 1, 2021): 798–810, <https://doi.org/10.1016/j.jneb.2021.04.467>.

¹²⁴ Samuel Sellers, Kristie L. Ebi, and Jeremy Hess, “Climate Change, Human Health, and Social Stability: Addressing Interlinkages,” *Environmental Health Perspectives (Online)* 127, no. 4 (April 2019), <http://dx.doi.org.ezp-prod1.hul.harvard.edu/10.1289/EHP4534>.

¹²⁵ Carol Hunsberger et al., “Climate Change Mitigation, Land Grabbing and Conflict: Towards a Landscape-Based and Collaborative Action Research Agenda,” *Canadian Journal of Development Studies / Revue Canadienne d’études Du Développement* 38, no. 3 (July 3, 2017): 305–24, <https://doi.org/10.1080/02255189.2016.1250617>.

¹²⁶ Hunsberger et al., “Climate Change Mitigation, Land Grabbing and Conflict.”

¹²⁷ Felix Creutzig et al., “Integrating Place-Specific Livelihood and Equity Outcomes into Global Assessments of Bioenergy Deployment,” *Environmental Research Letters* 8, no. 3 (September 2013): 035047, <https://doi.org/10.1088/1748-9326/8/3/035047>.

Emerging Insecurity Factor 7: Social Disruption

Unlike the political institutions and physical infrastructure of structural upheaval, social disruption refers to the impact climate change will have on humans and human relationships—such as demographics, and movements of people—and as such the political stability and the social fabric of a community. Social disruption is interdependent with structural disruption, resulting in cycles that intensify conflicts, leading in many cases to social tensions, displacements, and migration.¹²⁸ Social disruptions such as demographic shifts and migration will further stress states experiencing significant climate disruptions, and may result in political destabilization.

Demographic Shifts. Changes in a community’s demographics may increase social tensions and levels of conflict and violence. The following are examples and trends in the Indo-Pacific.

Population growth will drive demand for employment, poverty reduction, and public services.¹²⁹ And, with high population growth expected throughout the Indo-Pacific, there are expected to be ‘youth bulges.’ While youth bulges can boost local economic activity, if young people are deprived of opportunities or disenfranchised, they can lead to violence. The likelihood of conflict increases by 7% for every 1 percentage point increase in youth cohorts (15-24 year olds).¹³⁰ The likelihood of conflict triples if youth make up more than 35% of the adult population (compared to developed nations’ average of 17% youth in the adult population).¹³¹ In regions where marriage and adulthood are conditional on economic independence, young people who experience difficulties in achieving economic advancement are far more likely to experience social humiliation which may lead to violent outbursts.¹³² The combination of poor economic performance and youth bulges can be particularly explosive, and has been considered a possible explanation for violence initiated by students in Myanmar in the early 2000s.¹³³ Climate change is expected to cause disruptions of basic services in the economy, such as power and water supplies, sanitation, and transportation, which can strip communities of their livelihoods and assets, and disrupt their social fabric, exacerbating poverty, and reinforcing inequalities.¹³⁴ The two regions at greatest risk of combined fragility, climate change, and youth bulges are South-Central Asia and South Asia; Southeast Asia is ranked sixth of 12 regions. The countries in the Indo-Pacific ranked highest for these risk factors are Bangladesh and Myanmar; other

¹²⁸ Julie Lynne Drolet and Tiffany Sampson, “Addressing Climate Change from a Social Development Approach: Small Cities and Rural Communities’ Adaptation and Response to Climate Change in British Columbia, Canada,” *International Social Work* 60, no. 1 (January 1, 2017): 61–73, <https://doi.org/10.1177/0020872814539984>.

¹²⁹ Colin Walch, “Collaboration or Obstruction? Rebel Group Behavior during Natural Disaster Relief in the Philippines,” *Political Geography*, Special Issue: Climate Change and Conflict, 43 (November 1, 2014): 40–50, <https://doi.org/10.1016/j.polgeo.2014.09.007>.

¹³⁰ Tobias Ide et al., “Multi-Method Evidence for When and How Climate-Related Disasters Contribute to Armed Conflict Risk,” *Global Environmental Change* 62 (May 1, 2020): 102063, <https://doi.org/10.1016/j.gloenvcha.2020.102063>.

¹³¹ Walch, “Collaboration or Obstruction?”

¹³² “Youth and Violent Conflict: Society and Development in Crisis” (United Nations Development Programme, 2006), 17, <https://reliefweb.int/sites/reliefweb.int/files/resources/810B078967D17D1AC12571920052088C-UNDP%20youth.pdf>.

¹³³ Eoghan Darbyshire, “Deforestation in Conflict Areas in 2020” (Climate and Environment Observatory, April 22, 2021), <https://ceobs.org/assessment-of-recent-forest-loss-in-conflict-areas/>.

¹³⁴ Katharine J. Mach et al., “Climate as a Risk Factor for Armed Conflict,” *Nature* 571, no. 7764 (July 2019): 193–97, <https://doi.org/10.1038/s41586-019-1300-6>.

countries expected to experience a youth bulge with moderate climate and fragility risks include India, China, Indonesia, Philippines, Vietnam, Japan, and several Pacific Island countries.¹³⁵

Gender imbalance is another vulnerability that is exacerbated by climate change, which can lead to increases in conflict.¹³⁶ Studies show that weather shocks increase the rate of sex-selective abortion (common in Vietnam and India, as well as other Indo-Pacific countries), likely due to economic stressors that increase preferences for boy children.¹³⁷ This phenomenon can shift demographics, resulting in excess unmarried males, sometimes called ‘bare branches.’¹³⁸ Countries that experience these swings often experience higher levels of domestic and interstate violence committed by young men who lack stable social bonds, which can lead to shifts toward authoritarian political systems. China and India are most at risk of this change in male-to-female ratios. The two countries represent 38% of the world’s population, so it could have a significant impact on stability throughout the region.¹³⁹

Climate-Induced Migration. Climate-induced displacement will likely be a significant cause of social disruption in the Indo-Pacific. Millions of people will leave their homes due to disasters, inviable land with low water availability and agricultural productivity, lack of water, loss of employment, or violence, all of which are exacerbated by climate change. This movement of people often results in population growth in urban areas with poor living conditions and low employment.¹⁴⁰ Additionally, nations receiving climate migrants may lack the resources, land, and interest in hosting migrants due to resource and job constraints, ideological differences, and fears of infectious disease.¹⁴¹ These factors are likely to destabilize many of the fragile states reviewed in this paper. The following are ways this may play out in the region:

- A World Bank report projects that by 2050, 40 million (1.8% of the population) of South Asia’s residents will have to move within their own countries due to climate factors.¹⁴²
- In May 2020, Cyclone Amphan hit India, Bangladesh, and Sri Lanka, resulting in 3 million evacuees and 2 million homes destroyed or damaged.¹⁴³ Combined impacts of cyclones and

¹³⁵ Brian Harding and Jason Tower, “Myanmar Coup Weakens Southeast Asia Security and Cooperation” (United States Institute of Peace, April 13, 2021), <https://www.usip.org/publications/2021/04/myanmar-coup-weakens-southeast-asia-security-and-cooperation>.

¹³⁶ Valerie M. Hudson and Andrea M. den Boer, “Missing Women and Bare Branches: Gender Balance and Conflict” (The ECSP Report, 2005),

<https://www.wilsoncenter.org/sites/default/files/media/documents/publication/Hudson%2526denBoer.pdf>.

¹³⁷ Jaehyun Jung, “Weather Shocks and Sex-Selective Abortion: Evidence from Rural Vietnam,” 2017, 41, http://kea.ne.kr/conference-2017/download/S4-5-2_Jaehyun%20Jung.pdf; “Selective Abortion of Girls Appears Common throughout India,” *Harvard T.H. Chan School of Public Health* (blog), May 18, 2011, <https://www.hsph.harvard.edu/news/hsph-in-the-news/abortion-girls-india-subramanian/>.

¹³⁸ Harding and Tower, “Myanmar Coup Weakens Southeast Asia Security and Cooperation.”

¹³⁹ Hudson and den Boer, “Missing Women and Bare Branches: Gender Balance and Conflict.”

¹⁴⁰ Adelphi et al., “A New Climate for Peace: Taking Action on Climate and Fragility Risks, An Independent Report Commissioned by the G7 Members,” viii.

¹⁴¹ Thomas Fingar, “National Intelligence Assessment on the National Security Implications of Global Climate Change to 2030” (Washington, DC: House Permanent Select Committee on Intelligence House Select Committee on Energy Independence and Global Warming, June 25, 2008), https://fas.org/irp/congress/2008_hr/062508fingar.pdf.

¹⁴² Kanta Jumari Rigaud et al., “Groundswell : Preparing for Internal Climate Migration” (Washington, D.C.: World Bank, 2018), <https://openknowledge.worldbank.org/handle/10986/29461>.

¹⁴³ Michael Kugelman, “Climate-Induced Displacement: South Asia’s Clear and Present Danger | Wilson Center,” *Insights & Analysis* (blog), September 20, 2020, <https://www.wilsoncenter.org/article/climate-induced-displacement-south-asias-clear-and-present-danger>.

salinity intrusion in soil and water have been major, direct drivers of migration in Bangladesh, within the country and into India. Sea level rise has caused the disappearance of Sundarban region islands, which will likely result in more migration.¹⁴⁴

- Kiribati, the Marshall Islands, and Tuvalu are three atoll countries characterized by both high population increases and densities, especially on their urban atolls. The Federated States of Micronesia, Palau, and Tonga are also densely populated atoll groups. Under the worst case climate scenarios, all of the 350,000 or more residents of these countries would be displaced by sea level rise and would need to be relocated to other countries, including to Fiji.¹⁴⁵ Populations on Pacific islands are expected to be (and already are) the first climate migrants due to sea level rise. In the Pacific, resettlement on others' customary land has contributed to conflict and governance issues.¹⁴⁶ However, research has shown that islands are dynamic, with Tuvalu gaining 73.5 hectares in recent years, making it difficult to predict when these islands will disappear and when or if all inhabitants must move to new countries.¹⁴⁷

Factor 8: Potential Violence

Transboundary Resource Conflicts. The preceding discussion outlined ways small-scale climate security threats may emerge in the Indo-Pacific. The following is a sampling of larger, transboundary, resource-related conflicts that could arise in the region.

- Shrinking sea ice in the Arctic will increase competition (particularly between Russia and China) over sea route access and natural resources within those marine environments. As countries jockey for who controls marine passageways, oil reserves, and arctic settlements, disagreements could spark everything from small-scale skirmishes and demonstrations of power to full-scale battles. Nevertheless, the Arctic Council has, to date, maintained positive relationships in the region. Moreover, new sea routes may increase commercial trade and transport.¹⁴⁸
- Water scarcity has been connected to potential interstate conflicts, with researchers noting that if riparian states seek maximum water withdrawals from a shared river system at the expense of other states in the basin, the amplification of water shortages could lead to conflict. A 2012 Intelligence Community Assessment (ICA) prepared by the US Defense Intelligence Agency (DIA) judged that in the next 10 years as water shortages became more acute, shared water basins will increasingly be used as leverage, which may prove to be a destabilizing factor within a region.¹⁴⁹ Conflicts over shared water sources have since begun

¹⁴⁴ Jayaram and Network, "Climate-Fragility Risk Brief: South Asia," 7.

¹⁴⁵ Esteve Corbera, Carol Hunsberger, and Chayan Vaddhanaphuti, "Climate Change Policies, Land Grabbing and Conflict: Perspectives from Southeast Asia," *Canadian Journal of Development Studies / Revue Canadienne d'études Du Développement* 38, no. 3 (July 3, 2017): 297–304, <https://doi.org/10.1080/02255189.2017.1343413>.

¹⁴⁶ Jayaram and Network, "Climate-Fragility Risk Brief: South Asia."

¹⁴⁷ Paul S. Kench, Murray R. Ford, and Susan D. Owen, "Patterns of Island Change and Persistence Offer Alternate Adaptation Pathways for Atoll Nations," *Nature Communications* 9, no. 1 (February 9, 2018): 605, <https://doi.org/10.1038/s41467-018-02954-1>.

¹⁴⁸ Daniel R. Coats, "Worldwide Threat Assessment of the US Intelligence Community | Director of National Intelligence," <https://www.dni.gov/files/ODNI/documents/2019-ATA-SFR---SSCI.pdf>.

¹⁴⁹ Michael Klare, "Climate Change, Water Scarcity, and the Potential for Interstate Conflict in South Asia," *Journal of Strategic Security* 13, no. 4 (December 2020): 112, <https://doi.org/10.5038/1944-0472.13.4.1826>.

to develop.¹⁵⁰ Nearly all climate warming scenarios show decreases in water supplies, and many parts of the Indo-Pacific will be severely impacted by drought (see [Table 1: F4e](#) for details). Tensions between China, India, Bangladesh, and other countries over the Brahmaputra River may fuel climate-driven conflict. In the face of restricted water flows triggered by climate change, actions by government and non-state actors may contribute to water-based conflicts. For instance, the Brahmaputra River flows from China into India via the Arunachal Pradesh state, and includes the contested region of Tibet. China is also rumored to be considering plans to divert water from the river into northeastern China, reducing flows into India. Though experts do not expect conflict over the river to be imminent, the Himalayan glaciers that feed the river are expected to shrink dramatically as the climate warms, and may intensify existing tensions over water supplies, triggering localized conflicts and minor skirmishes that could erupt into much larger violence by the two nuclear-capable countries.¹⁵¹

- A 1996 Ganges Water Sharing Treaty has solved transboundary water disputes between Bangladesh and India, but between 1997-2016, 65% of the time Bangladesh did not receive its guaranteed share of water during critical dry periods. It is uncertain whether the Treaty will continue to work under these conditions.¹⁵²
- Should agreements such as the Indus Waters Treaty (1960) between India and Pakistan fail to hold, population movements may threaten militarized borders which may spark conflicts that destabilize the region.¹⁵³

Malign Actors Use Climate Shocks to Fuel Violence and Regional Destabilization. Malign actors are likely to seize upon climate change disasters to expand their power and influence. Climate-vulnerable regions, including many in the Indo-Pacific, typically lack the institutions necessary to transform or prevent resource conflicts, handle socio-economic grievances, or respond to crises which can intensify existing tensions between local populations.¹⁵⁴ Though more research is required, climate-fragility experts suggest that these environments create breeding grounds for violent extremists and terrorists who use them to gain followers during periods of heightened distrust in public authorities.¹⁵⁵ However, studies show that context matters when determining the risk of climate-disaster-related conflicts. One-third of all conflicts between 1980-2016 in countries with low levels of human development, political exclusion of certain ethnic groups, and large populations were preceded by a disaster within 7 days.¹⁵⁶ Additionally, post-disaster hostility between the government and aggrieved groups plays a role in whether conflict follows a crisis.¹⁵⁷ Other factors that impact

¹⁵⁰ José Antonio Peña-Ramos, Philipp Bagus, and Daria Fursova, “Water Conflicts in Central Asia: Some Recommendations on the Non-Conflictual Use of Water,” *Sustainability* 13, no. 6 (January 2021): 3479, <https://doi.org/10.3390/su13063479>.

¹⁵¹ Klare, “Climate Change, Water Scarcity, and the Potential for Interstate Conflict in South Asia,” 118.

¹⁵² Kazi Saidur Rahman et al., “A Critical Review of the Ganges Water Sharing Arrangement,” *Water Policy* 21, no. 2 (February 27, 2019): 259–76, <https://doi.org/10.2166/wp.2019.164>.

¹⁵³ “A Security Threat Assessment of Global Climate Change: How Likely Warming Scenarios Indicate a Catastrophic Security Future” (Washington, DC: The National Security, Military, and Intelligence Panel on Climate Change (NSMIP), February 2020), 49, <https://climateandsecurity.org/wp-content/uploads/2020/03/a-security-threat-assessment-of-climate-change.pdf>.

¹⁵⁴ Hunsberger et al., “Climate Change Mitigation, Land Grabbing and Conflict.”

¹⁵⁵ Jayaram and Network, “Climate-Fragility Risk Brief: South Asia,” 10.

¹⁵⁶ Ide et al., “Multi-Method Evidence for When and How Climate-Related Disasters Contribute to Armed Conflict Risk.”

¹⁵⁷ Walch, “Collaboration or Obstruction?”

whether intensifying climate change will increase conflict risks include low state capabilities and low socioeconomic development.¹⁵⁸ The following are historical events that suggest a connection between environmental disasters (such as those caused by climate change) and conflict, which can lead to malign activity:

- A strong July 2016 thunderstorm in Bangladesh sparked public criticism of the disaster response. The government responded with repression, fueling religious anti-government grievances which developed into armed conflict over a short time period.¹⁵⁹
- In contested regions of the Philippines, severe landslides and cyclones together have weakened government structures, reduced agricultural livelihoods and subsistence resources access, and made it more difficult for many to protect themselves. These events have created conditions for groups like the Moro National Liberation Front (MILF) and the Communist Party of Philippines to recruit those impacted by the disasters, and have encouraged others to engage in conflict to obtain the food and resources needed to survive.¹⁶⁰ In the aftermath of those disasters, the MILF did not engage in conflict, suggesting that local context plays a role in determining post-climate-disaster outcomes.¹⁶¹
- Climate change has created more favorable conditions for the spread of diseases such as Lyme disease, malaria, and dengue fever; many suspect that climate change may have played a role in the emergence of COVID-19, among an array of factors.¹⁶² Compounding shocks such as those that follow health crises like the COVID-19 pandemic create conditions favorable to organized crime actors who take advantage of distracted institutions to seize government, land, and assets.¹⁶³ It is believed that Myanmar's military Tatmadaw exploited COVID-19 to initiate a power grab and seize control from the democratically elected Aung San Suu Kyi.¹⁶⁴ Since the coup, the military has bombed ethnic armed groups in several states sending thousands of people to Thailand, China, and India. Thai and Chinese police have registered an increase in transnational crime activity since the coup.¹⁶⁵ And as the destabilization of Myanmar is perceived simultaneously as unacceptable to Singapore, advantageous to Cambodia, and ambiguous by Vietnam, climate change could be linked to regional disagreements that can weaken the Association of Southeast Asian Nations (ASEAN), causing harm to Southeast Asia as a whole.¹⁶⁶

¹⁵⁸ Mach et al., "Climate as a Risk Factor for Armed Conflict."

¹⁵⁹ Ide et al., "Multi-Method Evidence for When and How Climate-Related Disasters Contribute to Armed Conflict Risk."

¹⁶⁰ Joshua Eastin, "Hell and High Water: Precipitation Shocks and Conflict Violence in the Philippines," *Political Geography* 63 (March 2018): 118, <https://doi.org/10.1016/j.polgeo.2016.12.001>.

¹⁶¹ Walch, "Collaboration or Obstruction?," 40.

¹⁶² "Coronavirus and Climate Change," *C-CHANGE | Harvard T.H. Chan School of Public Health* (blog), May 19, 2020, <https://www.hsph.harvard.edu/c-change/subtopics/coronavirus-and-climate-change/>.

¹⁶³ Darbyshire, "Deforestation in Conflict Areas in 2020."

¹⁶⁴ Ronan Lee, "HSS - Covid Coup: How Myanmar's Military Used the Pandemic to Justify and Enable Its Power Grab - Queen Mary University of London," *Queen Mary University of London News*, February 17, 2021, <https://www.qmul.ac.uk/media/news/2021/hss/covid-coup-how-myanmars-military-used-the-pandemic-to-justify-and-enable-its-power-grab.html>.

¹⁶⁵ Harding and Tower, "Myanmar Coup Weakens Southeast Asia Security and Cooperation."

¹⁶⁶ Harding and Tower, "Myanmar Coup Weakens Southeast Asia Security and Cooperation."

IMPLICATIONS FOR THE US: INDOPACOM

Threat Profile. Moderate 1-2 °C/1.8-3.6° F warming may cause slight to moderate climate security threats in the Indo-Pacific in the coming 10-25 years.¹⁶⁷ According to US Department of Defense reports, with warming of 2-4+ °C/3.6-7.2+ °F, the gender-climate-security threat level has the potential to reach catastrophic levels.¹⁶⁸

Threats to the US Military. Strategically-important US security infrastructure in the Indo-Pacific region will experience significant threats from climate change.¹⁶⁹ Of particular concern are:

- Existential risk to security infrastructure due to sea level rise, especially on small islands.
- Extreme weather (intense rains, floods, etc.), such as in the South China Sea and Bay of Bengal, that threatens navy vessels as well as hampers military testing and training.
- Extreme demands for disaster response that require rapid recovery of US military bases as well as civilian disaster response measures simultaneously will strain resources.
- The need for added security to prevent extremist groups and malign actors from gaining control of disaster-affected regions.

POLICY RECOMMENDATIONS

Article 3 of the United Nations Framework Convention on Climate Change (UNFCCC) states, “parties should take precautionary measures to anticipate, prevent, or minimize the causes of climate change and mitigate its adverse effects.”¹⁷⁰ This paper has provided an overview of the most acute gender-climate-security threats within the INDOPACOM theatre of operation, and has offered a detailed analysis of climate security threats for countries with the biggest gender-climate-security risk factors: Bangladesh, Fiji, Indonesia, Myanmar, Philippines, and Vietnam.

This paper was based on an analysis of the following eight gender-climate-security factors: existing fragilities (1), exposures (2), and susceptibilities (3) in Indo-Pacific states, emerging climate stressors hazards (4) and disasters (5) within those states, and the potential for these risks and hazards to interact and result in structural upheaval (6), social disruption (7), and potential conflict (8). Additionally, this paper provided a brief survey of some of INDOPACOM’s largest climate risks and potential sources of intelligence as early warning signals of emerging climate-related conflicts.

The US and its allies in the Indo-Pacific region should make efforts to better prepare for and respond to the potential for climate-driven conflicts. In particular, data collection in two main areas needs to be significantly improved.

¹⁶⁷ “A Security Threat Assessment of Global Climate Change: How Likely Warming Scenarios Indicate a Catastrophic Security Future,” 46.

¹⁶⁸ “A Security Threat Assessment of Global Climate Change: How Likely Warming Scenarios Indicate a Catastrophic Security Future,” 46.

¹⁶⁹ “A Security Threat Assessment of Global Climate Change: How Likely Warming Scenarios Indicate a Catastrophic Security Future,” 51.

¹⁷⁰ “UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE” (1992), https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf.

Regional Data: More and better-refined state and regional-level data is required to adequately assess the climate security threat of each state within the Indo-Pacific. Much more in-depth, country-specific assessments should be conducted to tailor resilience-building and response strategies for each nation. Additionally, security intelligence would be better supported with research (classified or not) such as satellite observations and systemic monitoring and remote sensing systems that may be able to detect early signs of drought, and cropland mapping may provide indications of impending decreases in food and nutrition security.¹⁷¹

Gender Data: Information collected on the wellbeing of women related to emerging climate-related conflicts is frequently ignored, and militaries and security agencies often fail to consider gender as a factor that determines the likelihood of conflict.¹⁷² In particular, more effort should be made to systematically collect SGBV data to assess regional vulnerabilities and potentially to detect conditions that could lead to climate hazards developing into disasters and conflict.

Gendered Human Security Evaluations: Given the vital role women play in stabilizing families, economies, and communities, human security programs should include gender considerations at every level, and crucially, women should be consulted equally and substantively.

Gender-Based Consultations: Gender factors should be considered in any climate security scenario planning, and women should be consistently and meaningfully consulted to gather intelligence on emerging environmental changes and conflicts that may be unique to their gender roles. As noted, women are marginalized, are responsible for much higher unpaid family and care work, and are frequently barred from participating in the formal economy or in leadership roles. Nevertheless, consultations with women require their time and energy. To avoid further marginalizing women, it is vital to properly compensate them for their roles in providing climate security intelligence.

¹⁷¹ Mbow, Cheikh and Rosenzweig, Cynthia, “Food Security — Special Report on Climate Change and Land,” in *Special Report: Special Report on Climate Change and Land* (UN Intergovernmental Panel on Climate Change, 2019), 475, <https://www.ipcc.ch/srccl/chapter/chapter-5/>.

¹⁷² Heather Hurlburt, Elizabeth Weingarten, and Elena Souris, “National Security: What We Talk About When We Talk About Gender” (New America Foundation, December 11, 2018), <http://newamerica.org/political-reform/reports/national-security-what-we-talk-about-when-we-talk-about-gender/>.

APPENDIX

Country	Climate Hazard Security Risks														F5: ND-GAIN Index Rank 2021	F6: Gender Inequality Index (GII) Value (2019)	F6: Gender Inequality Index (GII) Rank (2019)	F7: Human Development Index (HDI) Value - Female (2019)	F8: Human Development Index (HDI) Value - Male (2019)
	F1: Climate Risk Index 1999-2018	F2: Warming Since 1980 (°C / century)	F3a: Fragile State Index Score 2021	F3b: Fragile State Index Rank 2021	F3c: Fragile State Index Points 10-Year Change	F4a: Coastal Flooding	F4b: Riverine Flooding	F4c: Tropical Storms	F4d: Landslides	F4e: Drought	F4f: Hurricanes	F4g: Wildfires							
Papua New Guinea	98	1.24 ± 0.27	80.9	52	-3.3	84	66	57	33	85	NA	51	153	0.728	181	NA	NA		
Bangladesh	7	0.90 ± 0.41	85	39	-9.4	7	7	1	10	15	33	NA	163	0.537	133	0.598	0.600		
India	17	1.44 ± 0.30	77	66	-0.23	1	5	5	1	2	5	5	127	0.488	123	0.673	0.699		
Indonesia	77	1.21 ± 0.18	67.6	99	-3.4	2	2	23	2	44	NA	1	100	0.480	121	0.694	0.738		
Burma/Myanmar	2	0.99 ± 0.30	93.8	23	-4.3	16	14	20	20	NA	NA	NA	161	0.478	118	0.564	0.592		
Cambodia	12	1.05 ± 0.27	80.6	54	-7.9	30	25	30	NA	58	NA	152	0.474	117	0.570	0.618			
Laos	76	0.96 ± 0.28	76	69	-10.7	135	96	NA	NA	NA	NA	136	0.459	113	0.589	0.638			
Nepal	9	1.65 ± 0.34	82.2	51	-11.5	142	NA	NA	4	14	40	8	127	0.452	110	0.581	0.623		
Philippines	4	0.97 ± 0.27	82.4	49	-2.5	6	9	2	7	24	NA	NA	117	0.430	104	0.720	0.715		
Bhutan	103	1.25 ± 0.60	68.3	96	-16.7	NA	NA	NA	NA	NA	NA	61	97	0.421	99	0.626	0.679		
Sri Lanka	22	1.37 ± 0.28	80.5	55	-12.3	10	15	22	25	55	NA	NA	106	0.401	90	0.759	0.794		
Fiji	13	1.30 ± 0.44	70.4	88	-10.7	86	101	67	NA	NA	NA	NA	77	0.370	84	NA	NA		
Maldives	175	NA	67.6	99	-3	75	72	58	NA	NA	NA	NA	103	0.369	82	0.698	0.756		
Samoa	71	1.41 ± 0.55	64.2	110	-5.3	129	141	80	NA	101	NA	NA	97	0.360	81	NA	NA		
Thailand	8	1.07 ± 0.24	70.9	87	-7.4	5	8	8	31	6	23	NA	67	0.359	80	0.782	0.776		
Tonga	75	1.34 ± 0.43	NA	NA	NA	NA	NA	38	NA	104	NA	NA	130	0.354	79	0.702	0.739		
Mongolia	53	2.92 ± 0.35	52.3	132	-7.3	134	145	NA	63	82	17	40	63	0.322	71	0.744	0.727		
Vietnam	6	0.91 ± 0.27	63.3	114	-12.3	3	4	3	26	48	NA	NA	102	0.296	65	0.703	0.705		
Brunei	175	NA	56.3	124	-9.3	NA	NA	NA	NA	NA	NA	52	40	0.255	60	0.830	0.848		
Malaysia	114	1.27 ± 0.15	56.9	123	-11.3	13	11	26	21	35	NA	20	48	0.253	59	0.797	0.821		
China	43	2.09 ± 0.23	68.9	95	-11.2	4	1	4	3	3	1	NA	62	0.168	39	0.744	0.777		
New Zealand	90	0.97 ± 0.24	18.4	176	-6.4	63	75	52	NA	60	38	NA	2	0.123	33	0.912	0.948		
Australia	33	1.40 ± 0.25	21.8	170	-6.3	29	37	14	43	47	14	14	132	0.097	26	0.932	0.955		
Japan	62	1.66 ± 0.23	32.2	161	-1.2	21	22	7	16	NA	45	31	17	0.094	24	0.906	0.927		
Singapore	180	1.45 ± 0.22	26.6	165	-8.3	NA	NA	NA	NA	NA	NA	NA	8	0.065	12	0.931	0.945		
South Korea	87	2.00 ± 0.21	32.5	159	-6.3	53	50	18	17	19	31	11	15	0.064	11	0.881	0.941		
Timor-Leste	177	0.90 ± 0.41	80.9	52	-4	106	124	110	NA	37	NA	NA	113	NA	NA	0.587	0.623		
Vanuatu	38	NA	NA	NA	NA	122	136	59	NA	NA	NA	NA	132	NA	NA	NA	NA		
(Federated States of) Micronesia	46	1.79 ± 0.51	71.7	81	-0.2								145	NA	NA		
Tuvalu	128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Kiribati	134	1.73 ± 0.94	NA	NA	NA	NA	95	106	104	NA	NA	NA	NA	NA	NA	NA	NA		
Marshall Islands	172	NA	NA	NA	NA	NA	101	108	79	NA	102	NA	NA	NA	NA	NA	NA		
American-Samoa	NA	1.43 ± 0.57	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Guam	NA	1.24 ± 0.33	NA	NA	NA	NA	NA	127	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Nauru	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
North Korea	NA	2.44 ± 0.23	90	30	-5.6	39	41	37	NA	53	50	NA	120	NA	NA	NA	NA		
Northern Marshall Islands	NA	NA	NA	NA	NA	NA	NA						NA	NA	NA	NA	NA		
Palau	NA	0.91 ± 0.27	NA	NA	NA	NA	NA	118	NA	NA	NA	NA	NA	NA	NA	NA	NA		

Table 1: Combined Climate, Fragility, and Gender Inequality Risks for Indo-Pacific Countries

		Projected Change for Period 2080-2099 (RCP2.6 and RCP8.5 with [historical])					
	Avg temp increase since 1960	Days with Heat Index >35°C	Number of Very Hot Days (T _{max} >35°)	Max Number of Consecutive Dry Days	Days with Precipitation >20mm	Average Largest 5-day Cumulative Rainfall	Max Number of Consecutive Wet Days
Bangladesh	0.90 ± 0.41	84.13-161.60 [68.85]	79.04-143.97 [60.48]	63.50-62.27 [63.68]	10.19-14.14 [10.28]	164.26-217.36 [164.52]	49.60-46.15 [47.19]
Fiji	1.30 ± 0.44	6.60-119.45 [NA]	NA	16.82-18.03 [18.38]	14.55-16.30 [15.15]	156.79-170.54 [152.27]	33.27-28.12 [26.28]
Indonesia	1.21 ± 0.18	3.87-268.79 [4.20]	11.27-123.5 [2.54]	13.45-15.14 [13.11]	29.5-34.97 [24.89]	160.19-169.94 [137.75]	98.77-87.33 [105.25]
Myanmar	0.99 ± 0.30	18.77-113.64 [23.30]	53.37-112.07 [41.96]	79.12-81.17 [74.64]	15.20-20.62 [14.48]	156.79-213.37 [163.28]	71.65-70.09 [75.29]
Philippines	0.97 ± 0.27	16.70-282.70 [2.18]	4.15-71.18 [1.52]	19.39-21.49 [22.69]	20.89-25.60 [19.72]	181.51-206.49 [170.38]	85.08-70.69 [77.85]
Vietnam	0.91 ± 0.27	22.96-170.96 [41.71]	37.36-135.29 [25.77]	43.23-46.41 [38.84]	13.64-16.47 [13.85]	146.03-173.63 [142.13]	63.63-43.91 [52.15]

Table 2: Average Temperature Increase and Projected Temperature and Precipitation Changes for 2080-2099

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