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Papua New Guinea, Climate and Security

By Rachel Fleishman

Edited by Erin Sikorsky and Francesco Femia

INTRODUCTION

This brief provides an overview of climate security risks in Papua New Guinea (PNG), one of four ‘priority’ countries selected by the United States Government for implementation of the U.S. Strategy to Prevent Conflict and Promote Stability. A new prologue to the strategy, released by the U.S. Government in April 2022, explicitly discusses the role of climate change in shaping state fragility and risks of conflict.

This brief is designed to help policymakers identify and address the role of climate change in shaping security outcomes in Papua New Guinea.

KEY RISKS AND OPPORTUNITIES

PRIMARY CLIMATE SECURITY RISKS

1. **Growing food insecurity**, stemming from the population’s dependency on subsistence farming, with key crops—predominantly sweet potatoes—at risk from climate-induced high temperatures, storms and pests.
2. **Illegal logging**, which is depleting the biologically rich forest systems best suited to provide cooling, erosion control, biodiversity support and other bulwarks against both climate change and economic instability.
3. **Escalating tribal violence and rising temperatures** in the Highlands, where intergenerational clashes, more powerful weapons, and the advent of extreme weather may form a perfect storm of stressors—far from civil, medical or police infrastructure that could temper the conflict.
4. **Movement toward China’s sphere of influence**, as signaled by agreements signed by both PNG and the soon-to-be-established Bougainville state.

OPPORTUNITIES TO ADDRESS RISKS

The United States has the opportunity to help PNG build the capacity to make data-based decisions with benefits for climate security, national security and sustainable development:

5. **Establish a broad, dynamic, transparent climate data platform** encompassing past and projected climate impacts, to inform decisions about climate mitigation, resilience and security.
6. **Identify and build capacity among local NGOs** best positioned to tackle the country’s top development challenges, including climate adaptation, education, human rights, women’s rights, adult literacy, health care.
7. **Offer technical and financial assistance** for electrification with renewable energy, focusing on under-served areas and grid resilience.
8. **Introduce standards, training and tools** for sustainable development, starting with agriculture and forestry and leveraging data-based tools.
9. **Consult with Australia and other trusted regional allies** on sensitive security issues, such as reinforcing the rule of law with local police forces and trust-building exercises with displaced Indonesian tribes.
10. **Provide targeted training for the PNG military and other first responders** to prevent, prepare for, and respond to the growing number of natural disasters in a responsible and humane manner.¹

1 Ilan Noy, “Natural disasters in the Pacific Island Countries: new measurements of impacts,” *Natural Hazards: Journal of the International Society for the Prevention and Mitigation of Natural Hazards*, Springer International Society for the Prevention and Mitigation of Natural Hazards, vol. 84(1), pages 7-18, November 2016, https://ideas.repec.org/a/spr/nathaz/v84y2016i1d10.1007_s11069-015-1957-6.html.

BACKGROUND

Papua New Guinea (PNG) is a small island country in the South Pacific, comprising the eastern half of West New Guinea Island and about 600 other islands, of which the largest are New Britain, New Ireland, and the Autonomous Region of Bougainville. PNG's diverse ecosystems—from tropical rainforests and swampy wetlands to coral reefs and mountain glaciers—host 7% of the world's biodiversity.² The country also boasts valuable gold, copper, oil and natural gas, forestry and fish resources.

PNG's population of nearly 8 million is largely rural (87%), living in historically distinct, geographically disparate communities marked by poverty, under-development, poor infrastructure, police and government corruption and lack of structural and civic safety nets for women and other disadvantaged groups. Though Indigenous people own 97% of the country's 46 million hectares (113.7 million acres), exploitation of the country's rich mines and forests has primarily benefited foreign investors and corrupt officials, leaving local communities to contend with degraded local ecosystems. These factors, and PNG's position in one of the world's most tectonically active regions, render the country vulnerable to a multitude of security threats, including climate change.

CLIMATE CHANGE DYNAMICS

According to the World Bank,³ Papua New Guinea is the 10th most vulnerable country with respect to climate change. The country's climate is characterized by high heat and humidity, and a storm cadence governed by two monsoon seasons and the El Niño Southern Oscillation System. Because of its proximity to the equator, it has an average temperature of 31°C and one of the world's highest average rainfalls (over 2500 mm / year)—which translates into a steep baseline for future climate stress. PNG's coastal communities are at risk from sea-level rise, storms, and storm surge. Its rural farmers, miners and other workers live a largely subsistence existence, which grants them limited capacity to protect themselves and their assets from climate-induced disasters.

Key climate projections⁴ for PNG include:

- 1. Climbing temperatures:** both minimum and maximum temperatures are expected to rise considerably faster than the global average. Temperatures in the Western portion of the country are projected to surpass 35°C (95°F) 70-80 days a year in the 2020-2039 period, and trend sharply upward in the decades which follow.

2 World Bank, Papua New Guinea Country Profile 2021, <https://www.worldbank.org/en/country/png>.

3 World Bank Climate Knowledge Portal, "Papua New Guinea Climate Change Overview-Country Summary," <https://climateknowledgeportal.worldbank.org/country/papua-new-guinea#:~:text=Papua%20New%20Guinea%20is%20ranked,weather%20such%20as%20heavy%20rainfall>.

4 Compiled from the World Bank PNG Country Profile and the World Bank Papua New Guinea Climate Knowledge Portal, <https://climateknowledgeportal.worldbank.org/country/papua-new-guinea/climate-data-projections>, unless otherwise specified. Both use data from the IPCC AR5 and AR6 reports.

2. **Cyclones** are expected to decrease in number but increase in intensity, with economic losses rising in tandem. While under-developed countries are chronically under-insured,⁵ the impact on human health, safety and livelihoods will be high.⁶
3. **Sea-level rise (SLR)** is already inundating PNG's coastal communities and small islets. Indeed, the Carteret Islands were amongst the first to have documented climate refugees. Projected SLR of approximately 20cm by 2035⁷ threatens to further degrade coastal infrastructure, salinate low-lying agricultural areas, and compromise ecosystems and biological resources.
4. **High-intensity deluges prompting river flooding, coastal flooding and landslides** are projected to intensify, with the economic cost and the number of people affected both expected to double by 2030. One climate model⁸ predicts that the number of people affected annually will grow by 20,000 per year and the GDP impact will grow by \$90 million. Seismic events, an almost daily occurrence in PNG and its surrounding seas,⁹ will amplify landslide risks.
5. **Reduced access to fresh water** is an expected outcome of flooding and attendant degradation of water quality from salination and water-borne diseases. Given the already low penetration of safe drinking water, this will further jeopardize both human health and agriculture.
6. **Fisheries and coral reefs** face the dual threats of ocean acidification and ocean warming. Under the Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathway 4.5¹⁰ and more extreme scenarios, the marine environment will lose its capacity to support coral reefs. The cascading effects on the marine food chain are chilling, particularly from a food security point. PNG citizens rely on fish for a significant portion of their annual protein, and consume over 20 kg of fish per year.

Available evidence thus suggests that PNG—whose adaptive capacity is estimated to be the 11th lowest in the world¹¹—is facing a surge in natural disasters that will imperil its poorest and most vulnerable communities. How the international community responds, and which countries PNG selects as partners in development, may determine the country's political, economic and social development, and its security, for years to come.

5 Because the preponderance of assets in developing countries are uninsured, their damage or loss doesn't rank highly on lists of infrastructure at risk of climate change. However, such a ranking is not indicative of the assets' contribution to the quality of life or societal stability of the populations they serve.

6 For more information and modeling see work done by the Australian Bureau of Meteorology <http://www.bom.gov.au/pacific/png/index.shtml> and CISRO, the Australian national science agency <https://www.csiro.au/en/work-with-us/international/pacific>.

7 From a 2008 baseline, average of projections from the RCP 4.5 and RCP 8.5 scenarios, interactive map at <https://climateknowledgeportal.worldbank.org/country/papua-new-guinea/impacts-sea-level-rise>, accessed May 10th 2022.

8 AQUEDUCT Scenario B, under an RCP 8.5 scenario for 2030.

9 Earthquake Track, "Recent Earthquakes in Papua New Guinea, accessible at <https://earthquaketrack.com/p/papua-new-guinea/recent>.

10 Representative Concentration Pathways are scenarios of greenhouse gas emissions and resulting concentrations over time, as well as land use projections, that together result in warming trends from the present through 2100. These scenarios are used as benchmarks for governmental, business and societal mitigation and adaptation efforts.

11 United Nations, INFORM Report 2019, November 2019.

SOCIO-POLITICAL AND SECURITY DYNAMICS

PNG's natural beauty and rich array of historic communities belie a range of social, political, and security issues that could hamper its ability to contend with both traditional and climate security challenges.

- **Government instability.** PNG is one of the world's more unstable countries, ranking -0.74 on a scale of -2.5 to 2.5, according to the 2020 Political Stability Index¹² (the global average is -0.07) and dropping over 6 points on the Fragile States Index from 2017-2022.¹³ A constitutional crisis in 2011 was resolved with national elections in 2012, installing Peter O'Neill as Prime Minister and effectively removing the chief justice of the Supreme Court. O'Neill resigned in 2019 after alleged corruption during the purchase of two generators from Israel in 2013. His replacement, James Marape, adjourned parliament to escape a vote of no confidence in April 2021. Following elections marred by violence and irregularities in July and August 2022, the government faces a host of issues including those described below.
- **Independence for Bougainville Province—and a China angle.** Located 1000 km east of PNG capital Port Moresby, Bougainville Province is home to 250,000 Papua New Guinians and rich deposits of gold and copper. In 2019, 98% of its population voted for independence in a non-binding referendum. The Parliament established a political process that will culminate in Bougainville's independence in 2027. The question now is whether the province will be able to develop the political, economic and human capital to operate as an independent country. China has proffered assistance via its Belt and Road Initiative (BRI), reportedly tying an offer for airports, roads and bridges to collateral from the Panguna gold and copper mine,¹⁴ worth an estimated \$60 billion.¹⁵ China has also signed a security pact with neighboring Solomon Islands that may grant it access to military basing within 2000 km of Australia.¹⁶ How Panguna's owners—the Autonomous Bougainville Government (ABG) and a coalition of five local clans—navigate their dealings with China, and the ABG's ability to build a portfolio of local and foreign-invested development projects, will determine the trajectory for development, diplomacy and defense in the South Pacific.

12 The Global Economy, "Papua New Guinea Political Stability," https://www.theglobaleconomy.com/Papua-New-Guinea/wb_political_stability/, accessed May 20, 2022. The Political Stability Index (formally, the Political Stability and Absence of Violence/Terrorism Index) measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. It represents an average of several other indexes from the Economist Intelligence Unit, the World Economic Forum, and the Political Risk Services, among others.

13 Country Dashboard: Papua New Guinea, Fragile States Index, <https://fragilestatesindex.org/country-data/>, accessed July 10th, 2022. Group grievances, human rights, state legitimacy and external intervention contributed to the decline.

14 *ibid.*

15 "Panguna Share Value Doubles Overnight after landowners opt to reopen mine," Asia Pacific Report, February 15, 2022, <https://asiapacificreport.nz/2022/02/15/panguna-share-value-doubles-overnight-after-landowners-opt-to-reopen-mine/>.

16 Kate Lyons and Dorothy Wickham, "The deal that shocked the world: inside the China-Solomons Security Pact," *The Guardian*, April 20, 2022, <https://www.theguardian.com/world/2022/apr/20/the-deal-that-shocked-the-world-inside-the-china-solomons-security-pact>.

- **Lawlessness and vulnerable group-security.** Rural-urban migration, small arms proliferation, police-led violence and corruption, and increasing tribal disputes over land management have created a lawlessness that is essentially a structural void in PNG society. In this survival-of-the-fittest environment, women and girls are at acute risk. The U.S. government has documented numerous accounts of domestic violence, gender-based (including sexual) violence, and torture, especially within clans and families.¹⁷ An estimated two-thirds of women are subject to sexual assault. The general poor state of health care and the deprioritization of women contribute to PNG having one of the highest maternal mortality rates in the world.¹⁸ Adding COVID- for which only 2%-3% of the population has been vaccinated¹⁹—the population has been made even more vulnerable to future health risks.
- **Mismanagement of Refugees.** PNG has a long and checkered history with political refugees. Its refugee management strategy going forward will impact political stability domestically, with potential ramifications for other countries—including the United States. Two examples demonstrate the challenge. One is the settlement of about 7000 Muyu²⁰ from Indonesia’s West Papua region now in refugee villages in PNG, stemming from violent clashes with Indonesian forces in 1984. The Free Papua Movement has called for the neighboring territories of Papua and West Papua to secede. Recent uprisings and clashes between protestors, the West Papuan Liberation Army and the Indonesian military in 2019,²¹ 2020,²² and 2021²³ prompted Indonesia to announce it will segment the provinces into 7 separate units, under the guise of “special autonomy.” Cross-border conflict or calls for boycotts of Indonesian goods will likely shine the political spotlight on the US and its allies. A second example is Lombrum Air Base, which PNG had long run as a holding space for political asylum-seekers at the behest of Australia. It is now being converted into a PNG Navy base, with funding from the Australian military and consultation from the U.S. Navy. Political sensitivities about the fate of the remaining asylum seekers,²⁴ and conflicting PNG Government statements about projection of strength against the Chinese, underscore the shifting geopolitical dynamics in the region.

17 “2020 Country Reports on Human Rights Practices: Papua New Guinea,” US Department of State, March 30, 2021, <https://www.state.gov/reports/2020-country-reports-on-human-rights-practices/papua-new-guinea/>.

18 Human Rights Watch, “World Report 2021: Papua New Guinea,” <https://www.hrw.org/world-report/2021/country-chapters/papua-new-guinea>.

19 Johnny Blades, “West Papuans flee from conflict into remote PNG area,” *Radio New Zealand*, October 28, 2021, <https://www.rnz.co.nz/international/pacific-news/454356/west-papuans-flee-from-conflict-into-remote-png-area>.

20 Jo Chandler, “Refugees on their own land: the West Papuans in limbo in Papua New Guinea,” *The Guardian*, November 30, 2019, <https://www.theguardian.com/world/2019/dec/01/refugees-on-their-own-land-the-west-papuans-in-limbo-in-papua-new-guinea>.

21 Kate Lamb, “‘An earthquake’: racism, rage and rising calls for freedom in Papua,” *The Guardian*, August 30, 2019, <https://www.theguardian.com/world/2019/aug/31/an-earthquake-racism-rage-and-rising-calls-for-freedom-in-papua>.

22 Ben Dougherty, “Protests flare in Papua as students demand independence referendum,” *The Guardian*, September 28, 2020, <https://www.theguardian.com/world/2020/sep/29/protests-flare-in-papua-as-students-demand-independence-referendum>.

23 Johnny Blades, “West Papuans flee from conflict into remote PNG area,” *Radio New Zealand*, October 28, 2021, <https://www.rnz.co.nz/international/pacific-news/454356/west-papuans-flee-from-conflict-into-remote-png-area>.

24 “Australia to stop detaining asylum seekers in PNG,” *Al Jazeera*, October 6, 2021, <https://www.aljazeera.com/news/2021/10/6/australia-to-stop-offshore-detentions-in-png>.

- **Tribal Violence.** Violence amongst PNG tribes is common, especially in the Highland regions.²⁵ Disputes, primarily over land, follow a historical if unwritten logic. Each dispute is owned by a man, sanctioned by village elders, and plays out within the boundaries of the tribes involved. Short bursts of fighting are often followed by months or years of frozen conflicts, until negotiations are concluded. Yet the social and environmental dynamics of these fights are changing. Tribes are getting access to high-powered weapons.²⁶ Youth are instigating fights without elder approval.²⁷ As climate change degrades rural roads and COVID overwhelms the already sparse clinic network, the injured have few options for safe medical treatment. As in all aspects of PNG society, women and children are the most at risk, both because they are removed from the decision-making process and because they are deprioritized for care.

KEY CLIMATE SECURITY RISKS

The intersection of the climate change hazards and socio-political dynamics outlined above create four key climate security risks for policymakers to monitor and address going forward:

- **Growing food insecurity:** According to the UN, 70% of households in PNG are dependent on subsistence agriculture.²⁸ PNG's own Second National Communication on Climate Change suggests that 63% of calories consumed in rural areas depend on sweet potatoes, a crop projected to decline by 10% by 2050 due to climate impacts. Other key crops, such as maize, cassava, rice, sugarcane and taro, are projected to suffer the same fate.²⁹ Migratory pests and increasingly severe storms—compounded by the expected rapid rise in temperature—will magnify the risk.
- **Disputes and danger to forest resources.** PNG's extensive forests are biologically rich ecosystem resources as well as important carbon stores. However, illegal logging has led to a loss of about 3% of forest cover in PNG since 2000.³⁰ A 2018 Global Witness report uncovered extensive examples of lack of enforcement of environmental laws. According to the report, “An assessment of legality risks in most of the world's timber-producing countries found PNG's timber to be among the riskiest, with potential illegalities including corruption and bribery in the issuance of permits,

25 See <https://www.icrc.org/en/tribal-violence-papua-new-guinea>.

26 Rebecca Kuku, “Police warn of whole-out war as tribal violence in Papua New Guinea kills 19,” *The Guardian*, April 12, 2021, <https://www.theguardian.com/world/2021/apr/12/police-warn-of-whole-out-war-as-tribal-violence-in-papua-new-guinea-kills-19>.

27 Andrew Kobylinski, “Tribal Violence in Papua New Guinea,” International Committee of the Red Cross, March 15, 2022, <https://www.icrc.org/en/tribal-violence-papua-new-guinea>.

28 “National Adaptation Plan Process in Focus: Lessons from Papua New Guinea,” United Nations Development Programme, March 29, 2018, <https://www.undp.org/publications/national-adaptation-plan-process-focus-lessons-papua-new-guinea>.

29 Jarrod R Welch, Jeffrey R Vincent, Maximilian Auffhammer, Piedad F Moya, Achim Dobermann, David Dawe, “Rice yields in tropical/subtropical Asia exhibit large but opposing sensitivities to minimum and maximum temperatures,” National Library of Medicine, US National Institutes of Health, August 17, 2010, <https://pubmed.ncbi.nlm.nih.gov/20696908/>.

30 According to the Global Forest Watch Papua New Guinea interactive map, available at <https://www.globalforestwatch.org/dashboards/country/PNG/?category=forest-change>.

failure to follow the logging code of practice, and logging without the consent of indigenous landowners.” Compounding the issue is a systematic flow of women from other countries who are induced to enter PNG legally, then are transported by traffickers to logging (and other) business sites for sex and domestic servitude.³¹ As PNG is China’s largest source of tropical logs, most of which are sold as finished products to the US and the EU,³² all three countries have a stake in the resolution of these issues.

- **Turning up the heat on tribal violence—and societal fragility.** PNG’s most intense tribal violence takes place in the Highland areas, precisely where temperatures will climb the most due to climate change. The confluence of these two stressors will further aggravate societal tensions that are unaddressed by the nation’s domestic police and civil structures. Similarly, the lack of sufficient food, water and medicine to poor migrant villages will only make their deprivation more extreme, and the likelihood of unemployed men or youth taking violent action more likely, with or without provocation from Indonesia.
- **Movement toward China’s sphere of influence.** PNG signed the Belt and Road Initiative (BRI) in 2018, and Bougainville has signaled its openness to Chinese influence by indicating acceptance of BRI infrastructure guaranteed by Panguna mine revenues. With the Solomon Island-China agreement inked in 2022, U.S. influence in the region is further diminished. How Australia and its allies, particularly the United States, respond to the real and growing diplomatic and development needs of PNG and its Pacific Island neighbors—many exacerbated by climate change—could well set the trajectory for defense and security in the region for years to come.

KEY CONSIDERATIONS AND OPPORTUNITIES FOR PREVENTING INSTABILITY AND CONFLICT

Implementation of the U.S. Global Fragility Strategy provides multiple opportunities to address these complex risks. The United States should consider a modular set of no-regrets, co-beneficial strategies to achieve the following goals:

- **Establish a broad, dynamic, transparent climate data platform** encompassing past extreme weather events and projected climate impacts for PNG territory and surrounding seas. Data should be accessible to multiple audiences, with key users including regional governments, businesses, academics, civil servants and aid agencies. Crowd-sourcing localized data can

31 2021 Trafficking in Persons Report: Papua New Guinea, US Department of State, <https://www.state.gov/reports/2021-trafficking-in-persons-report/papua-new-guinea/>.

32 Ben Doherty, “Bulk of timber exports from Papua New Guinea won’t pass legal test,” *The Guardian*, 29 July 2018, <https://www.theguardian.com/environment/2018/jul/30/bulk-of-timber-exports-from-papua-new-guinea-wont-pass-legal-test>.

introduce people new to computers and mobile phones to collaborative science. Data collected can inform decisions and investments in climate mitigation, resilience and security.

- **Identify and build capacity among local NGOs best positioned to tackle the country’s top development challenges**, including education, human rights, women’s rights, adult literacy, and health care. A first step would be a review of available data, capacity and funding with consideration of how respected institutions—such as religious, academic and military organizations- might offer resources, facilitation or expertise.
- **Offer technical and financial assistance for electrification with renewable energy**, focusing on under-served areas and grid resilience. Distributed renewable energy-powered microgrids would have the co-benefits of enabling local communities and acting as “grid insurance” against future extreme weather events.
- **Introduce standards, training and tools for sustainable development**, starting with sustainable agriculture and forestry. Leverage AI and mobile phone-based tools used with success in India and elsewhere in the region, engaging local communities in ways that respect their indigenous cultures but also offer access to international markets. Specially provisioned PNG military units could be trained to intervene in illegal logging operations as well.
- **Consult with Australia and other trusted regional allies on sensitive security issues**. One such issue is addressing the failure of local police forces to enforce the rule of law. This will likely require a long-term strategy of sponsored instruction as well as collaboration with federal law enforcement to ensure that major transgressions are addressed fully and publicly. A second, international issue is preventing the West Papuan independence movement from sparking cross-border conflict. Here the first step would be to negotiate an inclusive peace process, convened by the UN or another trusted body.
- **Provide targeted training for the PNG military and other first responders** to prevent, prepare for, and respond to the growing number of natural disasters.³³ On the prevention side, military-enabled erosion control and building and power line reinforcement have the potential to both lower temperatures and restore sensitive ecosystems. Such action can also yield the co-benefits of increasing societal trust of the military, and sensitizing military planners to the needs of local populations. On the responsiveness side, the PNG military might benchmark other Indo-Pacific countries’ response to natural disasters, with particular attention to the Indian National Response Force,³⁴ to plan and build its own domestic capacity.

33 Ilan Noy, “Natural disasters in the Pacific Island Countries: new measurements of impacts,” *Natural Hazards: Journal of the International Society for the Prevention and Mitigation of Natural Hazards*, Springer International Society for the Prevention and Mitigation of Natural Hazards, vol. 84(1), pages 7-18, November 2016, https://ideas.repec.org/a/spr/nathaz/v84y2016i1d10.1007_s11069-015-1957-6.html.

34 Indian National Disaster Response Force official site, <https://ndrf.gov.in/>.

A holistic conflict prevention strategy that incorporates climate considerations for PNG should be anchored in local needs, collaboratively implemented and flexibly adapted to meet dynamic requirements. A truly ‘long-game’ approach should incorporate appropriate members of the U.S. NGO community and the private sector, as well as PNG-Americans who can contribute their insights, talents and cultural affinity to various aspects of the strategy.

CONCLUSION

Climate change exacerbates many of the security and stability issues that PNG already faces, both domestically and in the region. Yet the country can fashion its climate security response in a manner that builds institutional, cultural and technical expertise for navigating a range of security and societal tensions going forward. A growing renewable energy grid, societally-engaged security and disaster response services, and more ardent yet humane law enforcement offer attractive jobs for currently disenfranchised youth. Elevating and addressing issues facing women and children will enable women to take more contributive roles in society. As indigenous groups are able to take advantage of modern developments, and if overall governance (and thus trust in government) improves, the country can solidify a stronger basis for democratic practices. Thus, while addressing climate security is not a traditional course toward democracy, done thoughtfully, it can institutionalize democratic principles that will serve PNG well in the years to come.

ABOUT THE AUTHOR

Rachel Fleishman is a Senior Fellow for Asia-Pacific at the Center for Climate and Security, and Asia-Pacific Liaison at the International Military Council on Climate and Security (IMCCS), programs of the Council on Strategic Risks.