

I. Understanding the compound risks of climate change and fragility

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Introduction

Climate change is one of the most pervasive global threats to peace and security in the 21st century. It touches all areas of security, peacebuilding and development. The impacts of climate change are already adversely affecting vulnerable communities, and stretching the capacities of societies and governments to cope. The Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) affirms that these impacts on human security, peace and well-being will worsen, especially for the world's poorest, many of whom live in fragile states.¹

Climate change is best understood as a 'threat multiplier' that interacts with and compounds existing risks and pressures in a given context, and could increase the likelihood of instability or violent conflict. An understanding of the relationship between climate change and security is possible only through a rigorous exploration of the complex interactions between different risk factors, where climate change is understood as a variable that affects pre-existing economic, environmental, political and social pressures.

This section examines seven compound factors that climate change can influence and that in certain contexts pose an increased risk to state and societal stability and of conflict.² The seven factors are (a) local resource competition; (b) livelihood insecurity and migration; (c) extreme weather events and disasters; (d) volatile food prices and provision; (e) trans-bound-

¹ Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, (IPCC/Cambridge University Press: Cambridge/New York, 2014). The term 'fragile state' is used to describe a country that cannot manage economic, environmental, political or social shocks and stresses through its institutional processes. As others have noted, this assessment of a country's capacity for institutions to absorb shocks and stresses is a subjective process, often undertaken at the expert level. Milante, G., Jang, S. and Burt, A., 'Beyond fragile states: understanding security and development through a systems approach', *SIPRI Yearbook 2015*. Although the term 'fragility' also has limitations, it offers a useful rubric for considering a range or spectrum of related governance problems. State fragility manifests itself in various forms and to varying degrees. Countries experience different situations of fragility. These can emerge at the local, national, regional and global levels. Rocha Menocal, A. and Othieno, T., 'The World Bank in fragile situations: an issues paper', Overseas Development Institute, Paper prepared for the conference on An Eye on the Future: the World Bank Group in a Changing World, Amsterdam, 12–13 July 2008; and Asian Development Bank, *Working Differently in Fragile and Conflict-affected Situations: The ADB Experience* (Asian Development Bank: Manila, 2012). In this chapter, the term 'fragile state' covers the whole spectrum and all levels of situations of fragility, including intrastate and trans-boundary conflicts.

² This chapter discusses both conflict and violent conflict. Conflict occurs when differences arise between individuals or groups and often increases in the face of any form of change. Violent conflict occurs when conflicts are not resolved using peaceful means. In this chapter, violent conflict covers the full range of scales from local armed skirmishes and violent protests, to civil or interstate war.

ary water management; (f) sea-level rise and coastal degradation; and (g) the unintended effects of policies on climate change adaptation and mitigation.³ These compound climate-fragility risks are based on an analysis of conflict and fragility dynamics that can already be observed and are likely to increase as the impacts of climate change increase. The section also examines certain limitations in some of the literature that aims to either assert or disprove a direct causal link between climate change and the risk of fragility or conflict, and concludes with a summary of the contributory role that climate change can play.

Local resource competition

The impacts of climate change directly affect the availability and quality of, and access to, natural resources, particularly water, arable land, forests and extractive resources, at the same time as population growth and rising global consumption patterns are increasing demand. Growing competition when supply cannot meet demand can lead to instability and even violent conflict where there are no adequate management institutions or dispute resolution mechanisms in place.⁴ This is especially the case in fragile states where governance and security institutions such as the judiciary and police are weak or corrupt. The risk of conflict is higher where the changes in resource supply and demand coincide with other factors, such as a dependence on a narrow resource base, or a history of conflict, marginalization and ineffectual resource management.⁵

Global demographic trends indicate that local resource competition is set to increase.⁶ The global population is projected to rise by 2.4 billion to 9.7 billion by 2050, and growing global consumption is being driven by increased economic development in particular across the developing world. Demand for natural resource-intensive goods such as beef, dairy products and energy is therefore growing.⁷ At the same time, supply is becoming more volatile

³ These compound risks were first elaborated in Rüttinger, L. et al., *A New Climate for Peace: Taking Action on Climate and Fragility Risks* (Adelphi/International Alert/Woodrow Wilson Center/European Union Institute for Security Studies, EUISS: Berlin/London/Washington, DC/Paris, 2015).

⁴ Rüttinger, L. et al., *Water, Crisis and Climate Change Assessment Framework* (Adelphi: Berlin, 2011).

⁵ Hendrix, C. and Brinkman, H.-J., 'Food insecurity and conflict dynamics: causal linkages and complex feedbacks', *Stability: International Journal of Security and Development*, vol. 2, no. 2 (June 2013).

⁶ IPCC (note 1).

⁷ United Nations, Department of Economic and Social Affairs, Population Division, *World Population Prospects: Key Findings and Advance Tables*, 2015 Revision (United Nations: New York, 2015). Population projections include low, medium and high scenarios; this analysis assumes the medium-variant projection according to UN figures.

as pollution, environmental degradation, poor resource management and climate change affect both supply and supply routes.

As pressure on natural resources increases, access to and control of such resources become more valuable. Communities whose livelihoods are reliant on climate-sensitive resources and practices such as water, pasture for livestock, forestry products, aquaculture and rain-fed agriculture, are particularly vulnerable.⁸ Local resource conflicts can develop within communities, such as those between neighbouring farmers using the same well in a village, or between different groups, such as pastoralists and settled crop farmers. While increased competition usually manifests first at the local level, under certain circumstances tensions can rapidly escalate to the national, regional and international levels.⁹ In the worst case, natural resource competition can contribute to regional instability or civil conflicts. For example, land disputes were a major driver of 27 of the 30 civil conflicts in Africa between 1990 and 2009.¹⁰

However, it is not the supply of or demand for resources that is the determinant of conflict but rather how changes in resource availability and access are managed. Where the management of resources is relatively equitable and effective, the rising pressure need not increase the risk of conflict or fragility.¹¹ Where resource management is weak, inequitable or lacking, however, this can entrench pre-existing conflict fault lines such as the historic marginalization of certain groups. Effective and inclusive resource management approaches are thus an effective way of reducing conflict risk in the face of climate-related resource competition.¹²

Livelihood insecurity and migration

Climate change increases the human insecurity of people dependent on natural resources for their livelihoods. Rising human insecurity can induce them to migrate or seek out alternative, illegal sources of income, which in turn can drive conflict.

⁸ IPCC (note 1).

⁹ For example, localized competition for land was identified as a significant part of the backdrop to the post-election violence in Kenya in early 2008, and to the 1994 genocide in Rwanda; local tensions over water and land have been identified as conflict drivers in Ethiopia and Darfur in Sudan. See Evans, A., 'Resource scarcity, climate change and the risk of violent conflict', 9 Sep. 2010, Background paper for the *World Development Report 2011: Conflict, Security and Development* (World Bank: Washington, DC, 2011), pp. 5–7.

¹⁰ Alden Wily, L., 'Tackling land tenure in the emergency to development transition in post-conflict states: from restitution to reform', ed. S. Pantuliano, *Uncharted Territory: Land, Conflict and Humanitarian Action* (Practical Action Publishing: Rugby, 2009).

¹¹ Rüttinger et al. (note 4).

¹² Rüttinger et al. (note 4).

Climate change is already increasing the frequency and magnitude of droughts and floods.¹³ This has a profound and direct impact on livelihoods that are dependent on predictable rainfall patterns, most notably farming and herding but also water-dependent industries such as the extractive industries. In addition, more frequent extreme weather events such as cyclones have long-term adverse impacts on fish stocks. Increased climate-related natural disasters such as landslides and flash floods make livelihoods in highly climate-sensitive areas such as mountain regions or river flood plains more dangerous and less sustainable. The most vulnerable to these risks are most often the poorest—subsistence or tenant farmers or small-scale fisherfolk—who have limited assets and networks to enable them to diversify their livelihood options.¹⁴

When people dependent on climate-sensitive natural resources find their livelihoods no longer viable, they seek out alternative work or locations. Where there is also resource scarcity in the alternative location or job sector, there is an increased risk of conflict between the newcomers and those who were there first. For example, in northern Kenya many nomadic pastoralists have turned to fishing on Lake Turkana as recurring drought has reduced the viability of maintaining cattle herds, leading to lethal conflicts between rival Kenyan tribes and with Ethiopian fisherfolk on the other side of the lake.¹⁵

In some cases, climate change in conjunction with pre-existing high unemployment and large youth populations can mean that there are fewer employment opportunities all round. A lack of viable alternative livelihoods, particularly for rural youth and young men, can compound grievances or inequality and increase the risk of tensions igniting.¹⁶ In some fragile contexts where formal employment options are scarce, some youth may be drawn into joining armed groups or other illegal activities such as drug trafficking or poaching.¹⁷

Temporary migration and long-term migration can help to reduce fragility risks but also create new risks. Where alternative jobs *in situ* are limited, migration can help to reduce competition over jobs and the risk of conflict, but only if there are livelihood opportunities available to migrants. Further-

¹³ IPCC (note 1).

¹⁴ Vivekananda, J., Schilling, J., Mitra, S. and Pandey, N., 'On shrimp, salt and security: livelihood risks and responses in south Bangladesh and east India', *Environment, Development and Sustainability*, vol. 16, no 6 (Dec. 2014), pp. 1141–61.

¹⁵ Yongo, E. O., Abila, R. O. and Lwenya, C., 'Emerging resource use conflicts between Kenyan fishermen, pastoralists and tribesmen of Lake Turkana', *Aquatic Ecosystem Health and Management*, vol. 13, no. 1 (2010), pp. 28–34.

¹⁶ Urdal, H., 'Population, resources and political violence', *Journal of Conflict Resolution*, vol. 52, no. 4 (Aug. 2008), pp. 590–617.

¹⁷ Fetzek, S., *Climate-related Impacts on National Security in Mexico and Central America* (Royal United Services Institute: London, 2009).

more, some people may be unable to migrate because they are trapped by environmental risks, conflict or lack of resources. These ‘trapped populations’ may be pushed towards illegal or unsafe livelihoods or exploitative migration options such as trafficking.¹⁸

Risks associated with climate change affect men and women differently. For instance, when migration is adopted as a coping strategy, its impact is often dependent on the regional context. In Central America and South Asia, it is predominantly the male family members who travel for labour, often facing risks to their security at their destination and leaving female-headed households behind.¹⁹ In other contexts, such as South East Asia, the culture dictates that women migrate.²⁰ In many countries, women have fewer economic, political and social opportunities than men, limiting their adaptive capacities when male household members are absent.²¹ The pressures to migrate, destination choices, employment prospects and implications for social relations within a host community or back home all vary by gender. Thus, when considering the potential impacts of climate change on migration, gender and context are critically important.²²

The role of governance is a major determinant of whether climate-related livelihood insecurity increases the risk of conflict (see box 12.1). Non-climate factors such as inequitable land rights, poor infrastructure and trade barriers also increase livelihood insecurity. Communities that lack institutions, economic stability and civil society will be most at risk of political instability in the face of more frequent and severe climate impacts on livelihoods.²³

Extreme weather events and disasters

Extreme weather events such as cyclones increase the risk of violent conflict in fragile contexts. How a government reacts to and prepares for disasters

¹⁸ Black, R., ‘The effect of environmental change on human migration’, *Global Environmental Change*, vol. 21, supplement 1 (Dec. 2011), pp. S3–S11.

¹⁹ Cerrutti, M. and Gaudi, M., ‘Gender differences between Mexican migration to the United States and Paraguayan migration to Argentina’, *Annals of the American Academy of Political and Social Science*, vol. 630, no. 1 (July 2010); and Bhatta, G. D. et al., ‘Climate-induced migration in South Asia: migration decisions and the gender dimensions of adverse climatic events’, *Journal of Rural and Community Development*, vol. 10, no. 4 (2015), pp. 1–23. See also Schilling, J. et al., ‘Vulnerability to environmental risks and effects on community resilience in mid-west Nepal and south-east Pakistan’, *Environment and Natural Resources Research*, vol. 3, no. 4 (Dec. 2013), pp. 1–19.

²⁰ See Opiniano, J., ‘More remittances from women emphasize feminization of migration?’, ADB study, 2005, <http://www.academia.edu/2950355/More_Remittances_From_Women_Emphasize_Feminization_of_Migration_ADB_Study>. See also ‘Gender, migration and remittances’, IOM Fact Sheet [n.d.], <<https://www.iom.int/sites/default/files/about-iom/Gender-migration-remittances-infosheet.pdf>>.

²¹ Vivekananda, J., Schilling, J. and Smith, D., ‘Climate resilience in fragile and conflict-affected societies: concepts and approaches’, *Development in Practice*, vol. 24, no. 4 (2014), pp. 487–501.

²² Hunter, L. M., ‘Environmental change, migration and gender’, Population Reference Bureau, Mar. 2012.

²³ Vivekananda, Schilling and Smith (note 21).

Box 12.1. Case study: Syria

Syria suffered a severe drought in 2006–11, which had a significant impact on the country's primary agricultural region in the north-east. Nearly 75 per cent of the families that depended on agriculture suffered total crop failure. Pastoralists in the region lost nearly 85 per cent of their livestock, affecting an estimated 1.3 million people. These severe impacts were also a result of a legacy of ineffectual water and agricultural policies, in combination with large government subsidies for water-intensive wheat and cotton farming. These policies encouraged inefficient irrigation techniques and extensive use of groundwater resources.

As the drought intensified, the Syrian Government cancelled a number of state subsidies, which increased the price of diesel fuel and the fertilizers required for farming. The drought and the added expense made it no longer possible for farmers, herders and rural families to make a living from agriculture. Many migrated to the cities, putting additional stress on already strained urban infrastructure and basic services, and increasing urban unemployment.

In addition, the reduction in agricultural production led to more than 1 million Syrians experiencing food scarcity or insecurity, and food insecurity along with unemployment and added stress on urban services contributed to the tensions that led to public protests against the government in 2011, which eventually turned into outright civil war. Although water crises cannot be singled out as a primary determining factor, Syria illustrates how climate change in combination with other stress factors can put pressure on an authoritarian and unresponsive government that is not able to manage that pressure in a peaceful way.

Sources: Wadid, E., Katlan, B. and Babah, O., 'Drought vulnerability in the Arab region: special case study: Syria', Contributing paper (2010), UN Office for Disaster Risk Reduction, Global Assessment Report on Disaster Risk Reduction 2011 (UNISDR: Geneva, 2011); Office of the UN High Commissioner for Human Rights, Special Procedures of the Human Rights Council, 'UN Special Rapporteur on the Right to Food: Mission to Syria from 29 August to 7 September 2010', 7 Sep. 2010; Francesco, F. and Werrell, C., 'Syria: climate change, drought and social unrest', Center for Climate and Security, <<http://climateandsecurity.org/2012/02/29/syria-climate-change-drought-and-social-unrest/>>; De Châtel, F., 'The role of drought and climate change in the Syrian uprising: untangling the triggers of the revolution', *Middle Eastern Studies*, vol. 50, no. 4 (2014), pp. 521–35; Rüttinger, L. et al., *A New Climate for Peace: Taking Action on Climate and Fragility Risks* (Adelphi/International Alert/Woodrow Wilson Center/EUISS: Berlin/London/Washington, DC/Paris, 2015); and Kelley, C. P. et al., 'Climate change in the Fertile Crescent and implications of the recent Syrian drought', *Proceedings of the National Academy of Sciences of the United States of America*, vol. 112, no. 11 (Mar. 2015), pp. 3241–46.

can increase or mitigate the risk of conflict following such an event (see box 12.2). In the worst case, government action after a disaster can create grievances and increase the risk of conflict, while in the best case government action can be a springboard to build peace and increase resilience.²⁴

The relationship between disasters and weak governance is often mutually reinforcing. Disasters put additional strain on already weak government

²⁴ Harris, K., Keen, D. and Mitchell, T., *When Disasters and Conflict Collide: Improving Links Between Disaster Resilience and Conflict Prevention* (Overseas Development Institute: London, 2013).

Box 12.2. Case study: Thailand

In Thailand in 2011, 2 million people across 26 provinces were affected by floods caused by unprecedented monsoon rains. The monsoons damaged dams and reservoirs that had been deliberately overfilled to mitigate the effects of the weak monsoon season in 2010. During the crisis, hundreds of people took to the streets to protest against discrimination by the Flood Response Operation Centre and the unfair distribution of water, electricity supply, shelter and food. Public unrest and discontent with the government continued until a military coup in 2014.

The floods occurred when Thailand's political landscape was already fragile due to violent anti-government protests in 2008–2010. Elections in 2011 brought a new government party to power, which had not yet proved that it could redress class discrimination and deep-rooted citizen resentment. Following the poor emergency response, angry crowds broke a sandbag wall in Bangkok, which was protecting a wealthy district from water surges. Breaking the sandbag barrier was a public expression of frustration with the government due to its discrimination and favouritism.

The government launched a three-phase recovery programme that included building new infrastructure to prepare for future floods and a compensation scheme. However, the compensation scheme was not transparent, and after it was revealed that compensation was being unevenly distributed, protesters demanded fairer compensation. The government's poor disaster management and its inability to address the grievances of rural flood victims were strongly criticized.

Sources: Rüttinger, L. et al., *A New Climate for Peace: Taking Action on Climate and Fragility Risks* (Adelphi/International Alert/Woodrow Wilson Center/EUISS: Berlin/London/Washington, DC/Paris, 2015); Femia, F. and Werrell, C. E., 'Thailand forecast: floods, droughts and political instability', Center for Climate and Security, 14 Nov. 2011, <<http://climateandsecurity.org/2011/11/14/thailand-forecast-floods-droughts-and-political-instability/>>; Nindang, S. and Allen, T., 'Ahead of flood season: Thailand's communities demand greater preparedness', Asia Foundation, 8 Aug. 2012; and Thai Health Working Group, 'Flood of the century: warning of things to come', *Thai Health* (2012).

systems, disrupt economic activity, displace communities and often require a large-scale humanitarian response which a weak state is less able to manage—all of which can increase the risk of conflict. For example, recurrent drought and food insecurity in post-war Burundi in the mid-2000s contributed to increased levels of migration and tensions with host communities.²⁵ The 2004 tsunami in Sri Lanka helped to reignite tensions between government forces and the Liberation Tigers of Tamil Elam due to the inequitable disbursement of disaster relief across different identity groups.²⁶ Weak governance in turn hampers adequate protection of citizens and assets from weather shocks, which leaves communities living in fragile and

²⁵ Heijmans, A. et al., 'A grassroots perspective on risks stemming from disasters and conflict', *Humanitarian Exchange Magazine*, no. 44 (Sep. 2009).

²⁶ Keen, D., 'Compromise or capitulation? Report on WFP and the humanitarian crisis in Sri Lanka', Paper prepared for the conference on Humanitarian Assistance in Conflict and Complex Emergencies, World Food Programme, Rome, 23–25 June 2009; and Mampilly, Z., 'A marriage of inconvenience: tsunami aid and the unravelling of the LTTE and the GoSL's complex dependency', *Civil Wars*, vol. 11, no. 3 (Sep. 2009), pp. 302–20.

conflict-affected areas more vulnerable to the impacts of extreme weather events and disasters. In 2005–2009, more than 50 per cent of the people affected by disasters lived in fragile areas.²⁷ In fragile situations, disasters can exacerbate pre-existing conflict drivers such as inequality, worsen the risk of future crises and obstruct crisis recovery efforts.²⁸

A lack of state preparedness, social safety nets and insurance mechanisms as well as an inadequate disaster response can fuel social unrest, particularly if aid resources are perceived to be inappropriately or inequitably allocated. Humanitarian responses that inadvertently increase inequality between different groups can also exacerbate tensions and increase the risk of conflict. Conversely, effective disaster risk reduction and management efforts can provide opportunities to improve resilience to climate fragility and promote peace.²⁹

Volatile food prices and provision

Climate change, in conjunction with other factors such as population growth, rising energy prices and the rapid advance of biofuel production from crops, has heightened the volatility of food supplies and prices around the world, which has increased the risk of civil unrest.

Climate change impacts, such as higher temperatures, changing rainfall patterns, drought and flooding, affect the quality and quantity of the global food supply.³⁰ Changes in food supply lead to food price volatility and rising food prices. While higher food prices do not always lead to violent conflict, sudden food price hikes are a major driver of civil unrest and protest.³¹ In 2008 a global food crisis saw riots in response to food and fuel inflation across 48 countries, most notably including Bangladesh, Burkina Faso, Haiti and Pakistan.³² Analysis of these cases shows that the risk of unrest turning violent is contingent on contextual factors such as high unemployment, the marginalization of certain groups and political instability. Furthermore, food price riots are often used as a political tool to demonstrate people's discontent with a government and can be used by opposition groups to gain

²⁷ Kellet, J. and Sparks, D., *Disaster Risk Reduction: Spending Where it Should Count* (Development Initiative, Global Humanitarian Assistance: Wells, 2012).

²⁸ Harris, Keen and Mitchell (note 24).

²⁹ Jason, E., 'Peace in its wake? The 2004 tsunami and internal conflict in Indonesia and Sri Lanka', *Journal of Public and International Affairs*, vol. 19, no. 1 (Spring 2008), pp. 7–27.

³⁰ Hendrix, C. S. and Salehyan, I., 'Climate change, rainfall and social conflict in Africa', *Journal of Peace Research*, vol. 49, no. 1 (Jan. 2012), pp. 35–50.

³¹ Brinkman, H.-J. and Hendrix, C. S., *Food Insecurity and Violent Conflict: Causes, Consequences and Addressing the Challenges* (World Food Programme: Rome, 2011).

³² United Nations, Food and Agriculture Organization (FAO), *The State of Food Insecurity in the World* (FAO: Rome, 2009).

support.³³ For example, in 2008 protesters in Haiti rioting over food prices demanded the removal of the president.³⁴

Import-dependent fragile states, such as most of the Middle East and North Africa, are especially vulnerable to food price volatility and the concomitant risk of conflict. If food prices rise, governments are faced with a balance of payments deficit, as they have no option but to continue to import food at a higher cost at the expense of the net revenue from exports. In an effort to buffer citizens from price increases and reduce domestic discontent, governments may offer food subsidies. Food subsidies are often unsustainable, however, and can spark conflict if and when they are removed.³⁵

Trans-boundary water management

Shared water resources are often a source of cross-border tension. As the impacts of climate change affect the supply and quality of water, while at the same time the demand for water continues to grow, competition over water is likely to increase pressure on existing water-sharing agreements and governance structures.

The governance of shared water resources can present opportunities for collaboration as well as risks of increased tensions between different users. Almost every country with land borders shares some waters with its neighbours. International lake and river basins cover 46 per cent of the Earth's land surface and account for approximately 60 per cent of global river flow.³⁶ Many trans-boundary river basins, such as the Nile, the Ganges, the Indus, the Euphrates-Tigris, the Mekong, and the Amu Darya and Syr Darya, are located in historically fragile and conflict-affected regions. There have been no occurrences of wars fought over water to date, but as water supply becomes less certain and demand grows, climate change could compound the fragility risks facing trans-boundary basins. The future may not look like the past.

Climate change such as increased drought, rising temperatures and glacial melting will alter access to and the availability of trans-boundary water resources. Many of these waters are governed by historical agreements. However, the variability and uncertainty of water flows caused by climate change threaten to undermine existing water-sharing institutions, which are often based on the distribution of specific quantities of water rather than

³³ Evans (note 9).

³⁴ Evans (note 9).

³⁵ Hendrix, C. and Brinkman, H.-J., 'Food insecurity and conflict dynamics: causal linkages and complex feedbacks', *Stability: International Journal of Security and Development*, vol. 2, no. 2 (June 2013), p. 26.

³⁶ United Nations Water (UN-Water), *Transboundary Waters: Sharing Benefits, Sharing Responsibilities*, Thematic paper (UN-Water: Zaragoza, 2008); and UN-Water, Statistics, [n.d.], <<http://www.unwater.org/statistics/en/>>.

a percentage of a total amount. As water availability changes, the allocation of specific amounts of water may not be achievable, putting pressure on often already strained agreements.³⁷

The development of dams is a major cause of upstream and downstream dispute as they unilaterally change water flows and the power balance in these basins. Over 3700 major new dams are planned or under construction worldwide.³⁸ The shift to low-carbon energy is likely to see a growth in hydroelectric plants, which threatens to increase the risk of further disputes.

Sea-level rise and coastal degradation

Rising sea levels threaten the viability of lives and livelihoods in low-lying areas. More frequent flooding and the risk of loss of territory to the sea increase the prevalence of displacement, migration and social unrest. Changing water tables can also lead to challenges to existing maritime boundaries and legal access to ocean resources.

Rising sea levels already threaten the economic and physical viability of low-lying territory. Particularly at risk are the small island states, which face the loss of their entire territory, and cities built on river deltas and coasts, such as Karachi in Pakistan and Lagos in Nigeria, where flooding and storm surges will have a major impact on economic development and large, highly concentrated populations.³⁹ Territorial loss may increase migration, which in turn may increase competition for resources in the receiving location. Growing competition for resources has already been shown to heighten tensions between migrants and host communities, increasing the risk of conflict between the two groups.⁴⁰ In poor rural areas—such as Sindh in Pakistan—the rising sea level is likely to threaten food security and livelihoods. However, these areas are less likely to receive investments in protection systems, which could aggravate grievances between certain geographic communities and central government, and entrench the marginalization of these communities.

States with weak governance, poorly performing economies and a history of conflict will face the biggest challenges in managing territorial loss and the greatest risk of conflict or instability if affected communities perceive government responses to be inadequate or inequitable.

³⁷ Eckstein, G., 'Water scarcity, conflict and security in a climate change world: challenges and opportunities for international law and policy', *Wisconsin International Law Journal*, vol. 27, no. 3 (Dec. 2009).

³⁸ Zarfl, C. et al., 'A global boom in hydropower dam construction', *Aquatic Sciences*, vol. 77, no.1 (Jan. 2015), pp. 161–70.

³⁹ German Advisory Council on Global Change (WBGU), *World in Transition: Climate Change as a Security Risk* (WBGU: Berlin, 2007).

⁴⁰ Werz, M. and Conley, L., *Climate Change, Migration and Conflict: Addressing Complex Crisis Scenarios in the 21st Century* (Center for American Progress: Washington, DC, 2012).

The unintended effects of climate policies adaptation and mitigation

The impacts of climate change adaptation and mitigation policies can increase the risk of conflict if these policies are not sensitive to a fragile or conflict-affected context and have unintended negative effects on already fragile community dynamics. As such policies are more widely implemented around the world, the risks of unintended negative effects—particularly in fragile contexts—will also increase.⁴¹

Any response to climate change will have an impact on natural resources and local power dynamics. In a climate change-affected fragile context, failure to consider the implications of a policy on existing conflict dynamics could deepen conflict risks and further increase vulnerability to climate risks, for example by undermining economic development, aggravating political grievances and exacerbating human insecurity.⁴²

In an already fragile context, policies designed to help vulnerable communities adapt to climate change can increase fragility risks if they fail to consider the wider economic, political and social impacts—particularly any knock-on consequences they may have on access to resources, food security and livelihoods. Efforts to cut carbon emissions through shifts to green technologies and renewable energy could also pose a risk of conflict as these will create new power dynamics within highly politically sensitive energy sectors.⁴³ Policies to prevent deforestation are a significant component of climate mitigation as deforestation is responsible for nearly 20 per cent of global emissions.⁴⁴ However, strategies for forest protection are likely to increase the value of forests to governments and private investors.⁴⁵ Forest protection measures that do not share the financial benefits of forest resources with local forest-dwelling communities, or which lead to corruption and rent-seeking behaviour—particularly in fragile contexts without formal land titles—could entrench existing sentiments of marginalization and inequality among local communities and increase the risk of civil unrest or conflict.⁴⁶

⁴¹ Rüttinger et al. (note 3).

⁴² Peters, K. and Vivekananda, J., *Topic Guide: Conflict, Climate and Environment* (Overseas Development Institute/International Alert: London, 2014).

⁴³ German Advisory Council on Global Change (WBGU) (note 39); and Månsson, A., 'A resource curse for renewables? Conflict and cooperation in the renewable energy sector', *Energy Research and Social Science*, vol. 10 (Nov. 2015), pp. 1–9.

⁴⁴ Yasmi, Y. et al., 'The struggle over Asia's forests: an overview of forest conflict and potential implications for REDD+', *International Forestry Review*, vol. 14, no. 1 (Mar. 2012), p. 105.

⁴⁵ Brockhaus, M., Korhonen-Kurki, K., Sehring, J. and Di Gregorio, M., 'Policy progress with REDD+ and the promise of performance-based payments: A qualitative comparative analysis of 13 countries', Center for International Forestry Research, *CIFOR Working Paper* no. 196, 2015.

⁴⁶ Larson, A. M., 'Forest tenure reform in the age of climate change: lessons for REDD+', *Global Environmental Change*, vol. 21, no. 2 (May 2011), p. 540.

State of the evidence: the limitations of focusing on causality

The relationship between climate vulnerability and violent conflict has received considerable attention from the academic and donor communities.⁴⁷ A sizeable amount of the literature on the relationship between climate change and conflict frames climate change as exacerbating the scarcity of resources and generating new conflicts and security challenges, largely based on the 'resource wars' thesis but not always with explicit reference to it.⁴⁸ Interpretations of the link between scarcity and conflict are often overly deterministic in their aim to prove or disprove causality, often controlling for other pertinent contextual factors such as poverty, governance and economic stability. As a result, the findings from this school of research can be reductionist and less useful for policymakers and practitioners looking to engage in programmes that deal with the links between climate change and conflict in complex environments.

Some studies have identified an overlap of countries facing a double exposure to natural disasters and armed conflict, while others attempt to show or reject causal trends between climatic change and the incidence of conflict.⁴⁹ Thus far, the field has been dominated by quantitative approaches that analyse temperature and precipitation data in conjunction with conflict records.⁵⁰ In addition to the lack of conclusive results, these approaches are of limited use to the peacebuilding community, which includes governments and non-government organizations (NGOs), for two reasons.

First, while quantitative approaches might show whether there is a correlation between climate or weather and conflict variables, the approach provides no answers to why there is such a relationship or the nature of

⁴⁷ Gleditsch, N. P. (ed.), 'Special issue: climate change and conflict', *Journal of Peace Research*, vol. 49, no. 1 (Jan. 2012); Scheffran, J. et al. (eds), *Climate Change, Human Security and Violent Conflict: Challenges for Societal Stability* (Springer: Berlin, 2012); USAID, *USAID Climate and Development Strategy* (USAID: Washington, DC, 2012); and World Bank, *World Development Report 2011: Conflict, Security and Development* (World Bank: Washington, DC, 2011).

⁴⁸ Homer-Dixon, T. F., 'Environmental scarcities and violent conflict: evidence from cases', *International Security*, vol. 19, no. 1 (Summer 1994), pp. 5–40.

⁴⁹ Studies that have identified an overlap in the countries facing a double exposure to natural disasters and armed conflict include Scheffran, J. et al., 'Disentangling the climate-conflict nexus: empirical and theoretical assessment of vulnerabilities and pathways', *Review of European Studies*, vol. 4, no. 5 (Dec. 2012), pp. 1–13. Studies that show a causal trend between climate change and conflict include Burke, M. B. et al., 'Warming increases risk of civil war in Africa', *Proceedings of the National Academy of Sciences of the United States of America*, vol. 106, no. 49 (Dec. 2009), pp. 20 670–74; and Hsiang, S. M., Burke, M. and Miguel, E., 'Quantifying the influence of climate on human conflict', *Science*, vol. 341, no. 6151 (Sep. 2013). Studies that reject a causal trend between climate change and conflict include Buhaug, H., 'Climate not to blame for African civil wars', *Proceedings of the National Academy of Sciences of the United States of America*, vol. 107, no. 38 (Sep. 2010), pp. 16 477–82; and Slettenbak, R. T., 'Don't blame the weather! Climate-related natural disasters and civil conflict', *Journal of Peace Research*, vol. 49, no. 1 (Jan. 2012), pp. 163–76.

⁵⁰ Scheffran, J. et al., 'Climate change and violent conflict', *Science*, vol. 336, no. 6083 (May 2012), pp. 869–71; Scheffran et al. (note 49); and Theisen, O. M., Gleditsch, N. P. and Buhaug, H., 'Is climate change a driver of armed conflict?' *Climatic Change*, vol. 117, no. 3 (Apr. 2013), pp. 613–25.

any statistical relationship. The approach therefore offers no diagnostics or potential entry points for peacebuilding that could influence or disrupt the potential links between climate change and conflict.

Second, in almost all statistical analyses, security is reduced to the absence or presence of armed conflict, often measured by a certain number of combat deaths.⁵¹ This is in contrast to the security and development literature, which has moved away from focusing on state security—which might be measured by the number of armed conflicts—to a focus on human security.⁵²

Parts of the policy-oriented literature offer a broader conceptualization of security and climate along with a considerable degree of granularity on interacting factors and the entry points for addressing them.⁵³ This school of literature suggests that the effectiveness of governance and institutions in responding to climate change and variability will determine the likelihood of violent conflict and/or collaboration around natural resources. This line of enquiry argues that understanding the likely impact of climate change on conditions of peace and security requires a focus on institutional structures, governance mechanisms and natural resource management, which mediate these relationships. Proponents of this perspective do not deny the impact a changing climate might have on natural resource availability and the potential to add strain to existing conflict dynamics or create new dynamics. However, they stress that there is no simple causal relationship: ‘climate change factors do not cause violent conflict, but rather merely affect the parameters that are sometimes important in generating violent conflict’.⁵⁴

Conclusions

The risks presented by climate change are compound, complex and interrelated with other pressures and contextual factors, and there are interaction and feedback loops between the risks. Analyses of the range of compound risk trajectories show that the risks are greatest in fragile states, but can also present challenges in more stable states that experience pockets or periods of fragility.

⁵¹ See e.g. Buhaug (note 49); Burke et al. (note 49); and Slettebak (note 49).

⁵² Dalby, S., *Security and Environmental Change* (Polity Press: Cambridge, 2009); and Matthew, R. A. et al. (eds), *Global Environmental Change and Human Security* (MIT Press: Cambridge, MA, 2010).

⁵³ Smith, D. and Vivekananda, J. A., *Climate of Conflict: The Links Between Climate Change, Peace and War* (International Alert: London, 2007); Smith, D. and Janani, V., *Climate Change, Conflict and Fragility: Understanding the Linkages, Shaping Effective Responses* (International Alert: London, 2009); Hamza, M., Smith, D. and Vivekananda, J., *Difficult Environments: Bridging Concepts and Practice for Low Carbon Climate Resilient Development* (Institute of Development Studies: Brighton, UK, 2012); and Tänzler, D. and Ries, F., ‘International climate change policies: the potential relevance of REDD+ for peace and stability’, eds Scheffran et al. (note 47), pp. 695–706.

⁵⁴ Barnett, J. and Adger, W. N., ‘Climate change, human security and violent Conflict’, *Political Geography*, vol. 26, no. 6 (June 2007), pp. 639–55.

Key determinants of whether climate change increases the risk of conflict are pre-existing contextual factors such as poverty, poor infrastructure, weak natural resource governance or unsustainable resource management, lack of access to the world market, the fragility of state institutions, political instability and a history of conflict.

Once a country has crossed the threshold to violent conflict, it often becomes locked into a vicious circle of fragility, violent conflict and underdevelopment. It follows therefore that if the country is also highly exposed to the impacts of climate change, this climate vulnerability will further entrench the conflict cycle. On the other hand, effective responses to address compound risks will build resilience to climate change, conflict and poverty.