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CLIMATE CHANGE AND VIOLENT CONFLICT: SPARSE EVIDENCE FROM SOUTH ASIA AND SOUTH EAST ASIA

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SUMMARY

● **The impacts of climate change are increasingly viewed as global security risks, which will have far-reaching implications for both human and renewable natural systems. Most climate–conflict research has focused on East Africa and sub-Saharan Africa. This SIPRI Insights explores and summarizes the findings from a systematic literature review of climate–conflict research on South Asia and South East Asia. Although these regions have been greatly affected by both climate change and conflict, there have only been a small number of rigorous academic studies that focus on the climate–conflict relationship.**

While this constrains the ability to draw general conclusions, there is context-specific evidence that climate change can have an effect on the causes and dynamics of violent conflict in the region when: (*a*) it leads to a deterioration in people's livelihoods; (*b*) it influences the tactical considerations of armed groups; (*c*) elites use it to exploit social vulnerabilities and resources; and (*d*) it displaces people and increases levels of migration. In acknowledging that these mechanisms are often interlinked and more noticeable in some climatic, conflict and socio-economic contexts than in others, the need for more research in both regions is clear.

I. Introduction

The current humanitarian crises in Iraq, Lake Chad and Yemen demonstrate that climate-related security risks are becoming more prevalent, and that such crises require responses that span different security sectors, such as economic, political, military and environmental security.[1] It is increasingly acknowledged that climate-related security risks are undermining human, national and international security.[2] There is therefore an urgent need to deepen understanding of how and under what circumstances climate-related environmental change influences the risk and dynamics of violent conflict.[3] Nonetheless, current research shows that the answer is likely to be highly contextual.

This SIPRI Insights synthesizes the available research in order to explore the status of current scientific knowledge, inform future research and guide policy responses. To do so, the authors followed established approaches that focus on understanding the mechanisms that connect the two phenomena. To identify existing peer-reviewed research, a Boolean search string was

[1] Hassan, K., Born, C. and Nordqvist, P., *Iraq: Climate-related Security Risk Assessment*. (Expert working group on climate-related security risks: Stockholm, 2018); Vivekananda, J. and Born, C., *Lake Chad Region: Climate-related Security Risk Assessment* (Expert working group on climate-related security risks: Stockholm, 2018). See also Mobjörk, M. et al., *Climate-related Security Risks: Towards an Integrated Approach* (SIPRI and Stockholm University: Stockholm, 2016). On the significance of broader security sectors see Buzan, B., Wæver, O. and Lemaitre, P., *Identity, Migration, and the New Security Agenda in Europe* (St Martin's Press: New York, 1993).

[2] Adger, W. N. et al., 'Human security', ed. C. B. Field. et al., *Climate Change 2014: Impacts, Adaptation and Vulnerability*. Part A: *Global and Sectoral Aspects*. Contribution of Working group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Cambridge University Press: Cambridge, 2014), pp. 775–91.

[3] 'Climate-related environmental change' is taken to mean 'a change in biophysical conditions that are or will be affected by a change in the state of the climate or by variations in the mean state of the climate', Mobjörk et al. (note 1), p. 5. 'Violent conflict' is taken to mean 'deliberate violent acts perpetrated by a government or organized or semi-organized group against state forces, other organized or semi-organized groups or civilians', Mobjörk et al. (note 1), p. 16.

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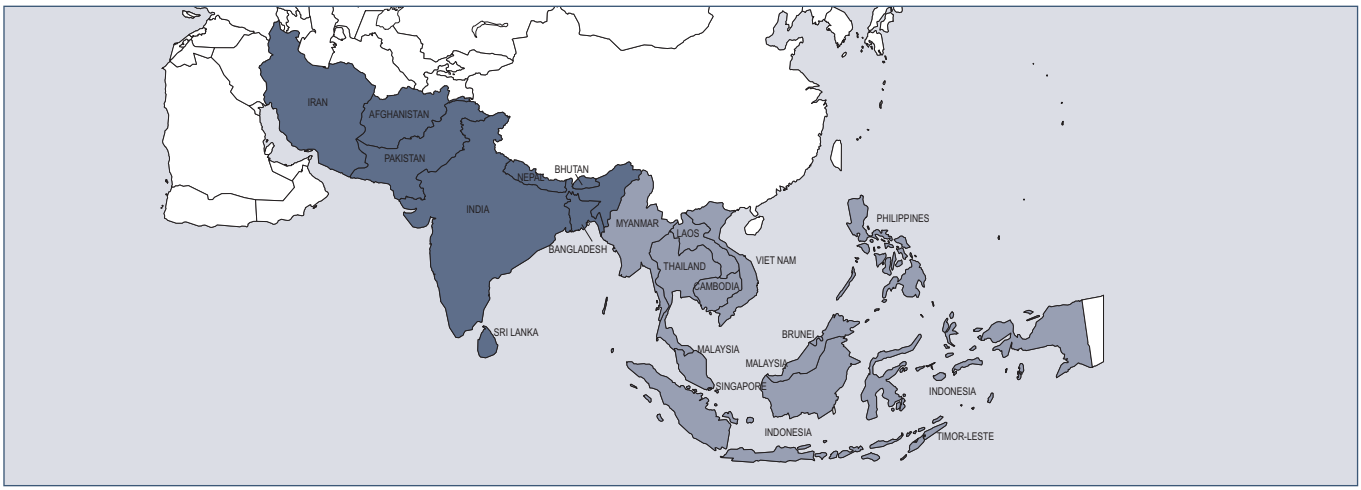

Figure 1. Regional map of South Asia (dark blue) and South East Asia (light blue)

used to locate articles in three standard academic databases. In the subsequent selection process, the initially identified articles were filtered by geographical or regional focus, topical relevance and empirical evidence on the complete causal pathways or mechanisms, through a three-stage review process. Both quantitative and qualitative research was included in the analysis.[4] This provided a scientifically sound way to identify and explain the link between climate change and conflict. Moreover, the emphasis on mechanisms has enabled points of intervention to be identified for policy-making that can assist conflict prevention.

Despite the fact that South Asia and South East Asia have been greatly affected by climate change and conflict, the analysis confirms that the links between the two phenomena remain understudied in both regions compared to other regions.[5] While this limits the ability to draw more general conclusions, the analysis below finds that existing research addresses similar categories of mechanisms linking climate change to the risk of violent conflict as those presented in previous reviews of other regions.[6] Nonetheless, there were also noticeable differences between the way these mechanisms play out in the two regions of Asia and in other regions of the world, which is to be expected given their different climatic, conflict and socio-economic contexts. For example, conflicts between herders and farmers, which are a key aspect of the links between climate and conflict in East Africa, are not a relevant feature in South Asia and South East Asia.

The analysis confirms that the links between climate change and conflict remain understudied

[4] The final review encompassed 21 peer-reviewed articles that specifically investigate the connection between climate-related change and violent conflicts in the two regions. For an extended discussion of the underlying methodology see van Baalen, S. and Mobjörk, M., 'Climate change and violent conflict in East Africa: Integrating qualitative and quantitative research to probe the mechanisms', *International Studies Review,* vol. 43, 10 Nov. 2017). See also Seter, H., 'Connecting climate variability and conflict: Implications for empirical testing', *Political Geography*, vol. 53 (Feb. 2016), p. 1.

[5] See Adams, C. et al., 'Sampling bias in climate-conflict research', *Nature Climate Change*, vol. 8, no. 3 (Mar. 2018).

[6] The mechanisms in this study are derived from the empirical evidence in the articles analysed. As noted above, these categories of mechanisms are similar to those presented in previous studies but vary in how they play out.

The findings from the systematic review reaffirm that policy responses to climate-related security risks need to acknowledge the complexity of the climate-conflict relationship through specific mechanisms, and to be adapted to specific contexts. However, more research is needed to enhance theoretical and empirical understanding of these regions. Breaking down the relationship into mechanisms allows more fine-grained dynamics to be identified, thereby revealing points of intervention and enabling tailored policy responses. This study shows that not enough is known about the climate–conflict relationship in these regions, and emphasizes the need for more research. However, making use of the scarce evidence that does exist, it is possible to say that it is important to emphasize the need for systemic approaches to assessing climate-security risks, in order to ascertain the validity of current responses in other contexts.

II. Contextual background: South Asia and South East Asia

South Asia and South East Asia, two regions characterized by social, political, ethnic and religious diversities, are home to 2.5 billion people (see figure 1).[7] Several countries in these regions experienced rapid economic growth in the 1990s. Today, many middle-income countries such as India, Indonesia, Malaysia and Thailand continue to substantially reduce the number of people living in absolute poverty.[8] Nonetheless, the process of poverty reduction has been slow and uneven. Many countries in both regions face the challenge of growing socio-economic inequality, linked to the unequal distribution of economic resources.[9] In some countries, many religious, ethnic or political minority groups continue to be marginalized by economic and political processes.[10] These groups often reside in rural or unplanned urban areas.

This study shows that not enough is known about the climate–conflict relationship in these regions, and emphasizes the need for more research

In this complex and diverse setting, livelihood and national security are further affected by climate change.[11] South Asia and South East Asia are experiencing an increase in temperature and sea-level rise, together with an increased prevalence of extreme climate-related events, such as floods, cyclones and droughts. A majority of the population live in rural areas, which makes them vulnerable to climate and environmental change as they rely on

[7] This report follows the United Nations regional definitions: South Asia comprises Afghanistan, Bangladesh, Bhutan, India, Iran, Nepal, Pakistan and Sri Lanka; South East Asia comprises Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste and Viet Nam.

[8] For details of the adjusted gross national income per capita and country-specific 'poverty headcount ratios' of the World Bank's middle-income countries, see World Bank, Data, Middle income, 2018, <https://data.worldbank.org/income-level/middle-income>.

[9] Asian Development Bank (ADB), *How Can Asia Respond to Global Economic Crisis and Transformation?* (ADB: Manila, 2012).

[10] Krampe, F. and Swain, A., 'Human development and minority empowerment', eds O. P. Richmond, S. Pogodda and J. Ramovic, *The Palgrave Handbook of Disciplinary and Regional Approaches to Peace* (Palgrave Macmillan: London, 2016).

[11] Eckstein, D., Künzel, V. and Schäfer, L., *Global Climate Risk Index, 2018: Who Suffers Most From Extreme Weather Events? Weather-related Loss Events in 2016 and 1997 to 2016* (GermanWatch: Bonn, 2018); Asian Development Bank (ADB), *The Rise of Natural Disasters in Asia and the Pacific* (ADB: Manila, 2013); and Uppsala Conflict Data Program, UCDP Conflict Encyclopedia, Uppsala University.

income from agriculture and fishing.[12] At the same time, there has been an increase in rural–urban migration. Cities are rapidly expanding and urban planning is struggling to keep up, especially in terms of climate-adaptive schemes and disaster preparedness.[13] For example, South East Asia has one of the longest coastlines in the world, leaving it heavily exposed to sea-level rise and extreme weather events. These affect coastal cities such as Jakarta, Manila, Bangkok and Ho Chi Minh City.[14]

Socio-economic and climatic processes are likely to compound political fragility and ongoing violence.[15] The most common forms of organized violence in the regions are communal conflicts, riots, rebel or insurgent group violence and state violence against civilians.[16] Economic, social and political discrimination combined with poor governance can underscore grievances and promote ideological struggles.[17] In other areas, a combination of the geographical features of the region and lack of governmental reach or support in rural, marginalized areas has been seen to favour insurgent movements.[18]

Socio-economic and climatic processes are likely to compound political fragility and ongoing violence

III. Pathways explaining the climate–conflict link

Despite the fact that several of the countries in South Asia and South East Asia extremely vulnerable to climate change are also affected by conflict, little attention has been paid to understanding the linkages between climate change and violent conflict in these two regions.[19] As noted above, the paucity of current research limits the number of published studies, making it difficult to identify clear regional patterns. This study therefore stresses the need for an improved empirical and theoretical understanding in future, to help explain the mechanisms that link climate change to violent conflict in these two regions.[20]

[12] Asian Development Bank (ADB), *A Region at Risk: The Human Dimensions of Climate Change in Asia and the Pacific* (ADB: Manila, 2017).

[13] See Brecht, H. et al., 'Sea-level rise and storm surges: High stakes for a small number of developing countries', *Journal of Environment and Development*, vol. 21, no. 1 (Jan. 2012), p. 120.

[14] See Dasgupta. S., 'Risk of sea-level rise: High stakes for east Asia and Pacific region countries', World Bank blog, 9 Mar. 2018. See also Smajgl, A. et al., 'Responding to rising sea levels in the Mekong Delta', *Nature Climate Change*, vol. 5, no. 2 (2015), pp. 167–74.

[15] See Ruttinger, L. et al., *A New Climate for Peace: Taking Action on Climate Fragility Risks* (Adelphi, International Alert, Wilson Center and EUISS2: Berlin, 015).

[16] Armed Conflict Location & Event Data Project (ACLED), 'Conflict trends: Real-time analysis of Asian political violence', no. 6 (Feb. 2017).

[17] Hazen, J. et al., *Armed Violence in Asia and the Pacific: An Overview of the Causes, Costs and Consequences*, UNDP briefing paper (UNDP: New York, May 2008); and Krampe and Swain (note 10).

[18] See Eynde, O. V., 'Targets of violence: Evidence from India's Naxalite conflict', *The Economic Journal*, vol. 128, no. 609 (Oct. 2016), p. 887; and Bagozzi, B. E. et al., 'Droughts, land appropriation, and rebel violence in the developing world', *Journal of Politics*, vol. 79, no. 3 (July 2017) p. 1057.

[19] Adams, C. et al., 'Sampling bias in climate-conflict research', *Nature Climate Change*, vol. 8 (Feb. 2018) p. 200; and Hendrix, C., 'Searching for climate-conflict links', *Nature Climate Change*, vol. 8 (Feb. 2018), p. 137. New studies are starting to address this gap, see e.g. Busby, J. et al., 'In harm's way: Climate security vulnerability in Asia', *World Development*, vol. 112 (forthcoming Dec. 2018), p. 88.

[20] The systematic review was based on studies on and in: India (9 studies), Pakistan (1 study), the Philippines (4 studies), Indonesia (3 studies), Bangladesh (3 studies) and Thailand (1 study). The selection criteria were highly specific and rigorous with regard to quality, hence the limited number of studies.

That said, the scarce evidence base that the systematic review has brought to bear provides confirmation of the mechanisms linking climate change to violent conflict identified in other regions, such as the Horn of Africa, as well as some new contextual insights. For example, the analysis provides new understanding of how the effects of rapid-onset disasters, the distribution of disaster aid, and the role and agency of insurgent groups in responding to and coping with climate change affect violent conflict. Moreover, the review reveals interesting nuances in the types of violence linked to climate change; that is, the type of violence appears to depend on the social and political context, rather than any observable climate-related environmental change.

The summary below is structured using four common mechanisms that explain how and when climate-related environmental change can lead to violent conflict.[21] These four mechanisms are used as broad logical pathways to structure the findings on the relationship between climate change and conflict. It is important to emphasize that consideration should also be given to alternative and conflicting explanations. Given the scarcity of existing evidence, no indications were found of additional mechanisms in the region. Nonetheless, absence of evidence is not evidence of absence, thus the need for further research. These mechanisms are often interlinked and relate to both the causes and the dynamics of conflict. However, analysing them separately, as seen below, helps to show the dynamic and multifaceted relationship between climate change and violent conflict, and derive the relevant implications for policymaking and future research.

The review reveals interesting nuances in the types of violence linked to climate change

Worsening livelihood conditions

In the research analysed, the focus is on areas where a large part of the population is reliant on resource-dependent income, such as from agriculture or fisheries—a pattern of dependency that is highly visible across both regions.[22] The research suggests that a decrease in livelihood security through a loss of income from agriculture or fishing, or a loss of renewable natural resources such as food and water, can increase the risk of onset and the dynamics of violent conflict. Rainfall shocks, decreases in rainfall or oceanographic changes can negatively affect income channels. This can then reduce the opportunity cost of people participating in illegal income-generating activities or joining armed groups, especially in areas where there is no legal alternative source of income. In some coastal areas of Indonesia, for example, reduced income opportunities from fishing have been linked to an increase in piracy-related activities.[23] In other cases, such as in some areas affected by the Naxalite conflict in India, worsening livelihood conditions have been related to the increased intensity of ongoing civil conflicts, with increased support for rebel or government groups.[24] The same factors have

[21] The summary provides only limited references. For full references see the forthcoming publication by Nordqvist, Krampe and Mobjörk.

[22] Roser, M., 'Employment in agriculture', Our world in data, 2018.

[23] Axbard, S., 'Income opportunities and sea piracy in Indonesia: Evidence from satellite data', *American Economic Journal*, vol. 8, no. 2 (Apr. 2016), p. 154.

[24] Eynde (note 18).

been found to increase violent competition over scarce resources in rural areas of Bangladesh.[25]

The character of the conflict in these cases is often low-intensity, local and responsive to seasonal dynamics. In addition, the available evidence suggests that increased intensity of ongoing conflicts or igniting new tensions between and within communal groups is not always the outcome of climate-related environmental events. Some studies suggest that the adaptive capacity of groups must be factored into the equation. For instance, climate-adaptive strategies and/or rapid-onset disaster responses in regions dependent on renewable natural resources can sometimes ignite new tensions between and within communal groups over access to these resources, while at other times they do not.[26] To some extent, the outcome seems to depend on the climate-adaptive capacity and planning abilities of the local government and institutions. Furthermore, a study on rapid-onset disasters in India found that social cohesion between and within communities can increase after a disaster rather than the disaster causing more tension. The reasons for this, however, are not well understood and need to be addressed in future studies.[27]

Rapid-onset disasters such as floods, can increase rebel recruitment or support for insurgency groups

Tactical considerations by armed groups

Several studies show that armed groups, such as rebel groups in the Philippines or the Naxalites in India, can make use of the societal consequences of climate events to gain power in an ongoing conflict. The literature analysed suggests three tactical reasons for this: (*a*) as a coping strategy to increase food security for the group; (*b*) as a recruitment tactic; and (*c*) as opportunistic behaviour. During droughts in agriculture-dependent areas in particular, rebel groups may increase their use of violence against civilians to ensure the group's own food security. This can be seen among both the Naxalite rebels in India and the Barisan Revolusi Nasional-Coordinate (BRN-C) rebels in Thailand. Both groups violently remove local farmers from their land to ensure enough cropland and agricultural supplies for their own use.[28] Furthermore, findings from India show that both rebel groups and government forces find recruitment easier in times of drought or when drought is expected. The risk of violence is especially high in rural areas, where government control is scarce and the local population is dependent on the support or protection of rebels or other armed actors.[29]

In relation to rapid-onset disasters such as floods, the findings from the conflicts in the Philippines and Pakistan, for example, show that rebel recruitment or support for insurgency groups can increase. However, this seems to be dependent on the presence and capacity of government actors,

[25] Ayeb-Karlsson, S. et al., 'A people-centred perspective on climate change, environmental stress, and livelihood resilience in Bangladesh', *Sustainability Science*, vol. 11, no. 4 (July 2016), p. 679.
[26] Ayeb-Karlsson (note 25).
[27] Slettebak, R. T., 'Climate change, natural disasters, and post disaster unrest in India', *India Review*, vol. 12, no. 4 (2013), p. 260.
[28] Bagozzi (note 18).
[29] Eynde (note 18).

the presence of competing groups and the rebel group's capacity to recruit.[30] In Pakistan, for example, increased support for the Islamist group Jamaat-ud-Dawa (JUD) after extreme floods in the Sindh province was only found in areas where the group already had a stronghold or where the government or other non-state groups were not present—and the JUD was able to provide disaster aid and assistance to the local population.[31] Similar examples were found in the Philippines. On the other hand, disasters can also decrease rebel recruitment, and even increase cooperation between armed groups. For example, in the Philippines the logistics and supply lines of the New People's Army (NPA) were weakened following typhoons in 2012 and 2013. Instead of focusing on recruitment, the group concentrated on internal (and to some extent external) recovery and reorganization strategies.[32] However, the long-term effects of such changes in patterns of support or recruitment have not been studied.

Elite exploitation

Some research has found that in the aftermath of rapid-onset disasters, local elites such as influential landowners or corporate entities can take advantage of their political networks to gain control over disaster aid distribution. The evidence suggests that local elites can gain power by controlling who the beneficiaries of aid will be, especially in relation to ongoing local conflicts. For example, government agencies often rely on private sector actors to distribute disaster aid. If this is not properly regulated, there is the increased risk that non-state actors will use the aid to alter power relations in ongoing conflicts. This link was found on the island of Sigocon in the Philippines, where local elites used the provision of aid to favour their own position in a long-standing, ongoing conflict over land.[33] Furthermore, in Bangladesh vulnerable segments of society are often forced to temporarily relocate when faced with seasonal disasters such as monsoons. In such circumstances, the risk of local elites systematically capturing and claiming land as their own increases. In the Brahmaputra-Jamuna floodplain, for example, rural landlords have used private armies to violently bar people from land they previously occupied. At the same time, these armies often constitute the poor and landless, as local tradition coupled with land scarcity have created a dependency on local elites for land and livelihood.

In the aftermath of rapid-onset disasters, local elites such as landowners can take advantage of disaster aid distribution

The risks seem to be higher in rural areas where the local government and the police either favour local elites or have low levels of governance

[30] Walch, C., 'Weakened by the storm: Rebel recruitment in the wake of natural disasters in the Philippines', *Journal of Peace Research*, vol. 55, no. 3 (Feb. 2018), p. 336; and Siddiqi, A., 'Climatic disasters and radical politics in southern Pakistan: The non-linear connection', *Geopolitics*, vol. 19, no. 4 (Aug. 2014), p. 885.

[31] Siddiqi (note 30).

[32] Walch (note 30).

[33] Uson, M. A. M., 'Natural disasters and land grabs: The politics of their intersection in the Philippines following super typhoon Haiyan', *Canadian Journal of Development Studies*, vol. 38, no. 3 (May 2017), p. 414.

capacity.[34] An additional pressure comes from the fact that land protection rights are few and patterns of land ownership are unequal in many of the countries in the two regions. This especially affects poorer populations that have few or no ties to local political elites or that are economically and politically marginalized in other ways. However, research into these dynamics remains very limited and the evidence is related to highly specific contexts.

Processes of migration

Some studies have explored the linkages between climate change and conflict through processes of migration. It is crucial to point out that both climate-related migration and its links to conflict are hugely understudied areas, and the reasons that influence people's decisions to relocate and why conflicts sometimes break out as a result are not sufficiently understood. Some studies in the systematic literature review provide evidence that socio-economic and political factors compound with climate-related environmental change, thereby influencing people's decisions to move. In Bangladesh, for example, unequal land distribution, poverty and the adverse effects of dams on people's livelihoods are compounded by climate change, thereby affecting people's decisions to relocate.[35] However, the studies in the review refer only to the contexts of intra-state and interstate migration within, or across the border between, India and Bangladesh—two countries that are ethnically and religiously diverse. In such circumstances, political structures in India can at times allow local (or national) political leaders to enable discrimination against vulnerable displaced groups, through either violent or socio-economic means, for the political and economic benefit of their own state.[36]

Socio-economic and political factors compound with climate- related environmental change, thereby influencing people's decisions to move

Furthermore, research also suggests that in this context, interstate and intra-state migration influenced by precipitation shocks increases the risk of riots in the host communities, which are often urban environments. These riots are most prevalent in resource-dependent areas with low levels of socio-political stability. A large influx of migrants can either increase or be perceived to increase livelihood insecurity, or it can reshape the political power dynamics between groups in the host society, especially between religious or culturally diverse groups.[37] In Tripura, India, a combination of increased competition over scarce natural resources and a perceived alteration of religious power balances influenced the outbreak of violence between migrants and locals.[38] In such instances, elites may take advantage

[34] Zaman, M. Q., 'Social structure and processes in char land settlement in the Brahmaputra-Jamuna floodplain', *Man*, vol. 26, no. 4 (Dec. 1991), p. 673.

[35] See Reuveny, R., 'Ecomigration and violent conflict: Case studies and public policy implications', *Human Ecology*, vol. 36, no. 1 (Oct. 2007).

[36] Bhavnani, R. R. and Lacina, B., 'The effects of weather-induced migration on sons of the soul riots in India', *World Politics*, vol. 67, no. 4 (Oct. 2015), p. 760.

[37] Bhavnani and Lacina (note 36); and Reuveny (note 35), p. 1.

[38] Reuveny (note 35), p. 1.

of ethnic or religious diversity in a society and seek to incentivize inter-religious riots linked to economic grievances.[39]

IV. Implications for future research and policymaking

In summary, and acknowledging the limited evidence base, what can be gleaned about the linkages between climate change and violent conflict in South Asia and South East Asia? The key finding from the systematic literature review is that knowledge is worryingly limited. In fact, countries such as Pakistan, Myanmar and Afghanistan, which are experiencing climate change and are host to notorious violent conflicts, are underrepresented in academic research. Similarly, the low number of rigorous academic studies that have so far been conducted in the countries and regions of South Asia and South East Asia constrains the ability to draw broader conclusions about the regions as a whole.

Nonetheless, the studies reviewed confirm previous analyses and show that, under certain circumstances, climate change increases the risk of conflict. Moreover, this study demonstrates that the four mechanisms identified in previous reviews of the climate–conflict linkage are also at play in the context of South Asia and South East Asia, albeit with notable differences. Climate-related environmental change influences violent conflicts when: (*a*) it negatively affects people's livelihoods; (*b*) it influences the tactical considerations of armed groups in ongoing conflicts; (*c*) elites exploit social vulnerabilities and resources; and (*d*) it displaces people and increases migration in vulnerable and highly vulnerable natural resource-dependent contexts.

Due to the limited amount of rigorous empirical research on the climate–conflict linkage in South Asia and South East Asia, *more research will be indispensable* to refining understanding of how climate change might increase the risk of violence and under what circumstances it is likely to do so. As violent conflicts are multi-causal, context-specific and develop over time, further research is essential not only to address knowledge gaps, but also to enable a more refined understanding of the applicability and adequacy of different response mechanisms in diverse contexts. To this end, it is important to analyse and compare regions that, despite being vulnerable and highly exposed to climate change, are able to peacefully mitigate such stressors.

Under certain circumstances, climate change increases the risk of conflict

Nonetheless, there are *relevant lessons to draw from the available research*. The climate–conflict linkage primarily plays out in contexts that are already vulnerable to climate change, and where income is highly dependent on agriculture and fishing. Therefore, it is important to support the development of alternative sources of income, to increase the coping capacity of communities to manage temporary losses of income and to strengthen communities' resilience in order to mitigate conflict risks. Various scholars have made suggestions that this might entail insurance schemes that smooth

[39] Bohlken, A. T. and Sergenti, E. J., 'Economic growth and ethnic violence: An empirical investigation of Hindu-Muslim riots in India', *Journal of Peace Research*, vol. 47, no. 5 (Sep. 2010), p. 589; and Swain, A., 'Displacing the conflict: Environmental destruction in Bangladesh and ethnic conflict in India', *Journal of Peace Research*, vol. 33, no. 2 (May 1996), p. 189.

out the annual income of vulnerable populations, a reduction in income sensitivity to climate conditions, legal reform and improved land rights, drought preparedness programmes and agricultural assistance.[40] Previous programmes, such as food assistance programmes, have been followed by either a decrease or an increase in violence at different periods of implementation, as they are likely to alter the power relations in a community. The dynamics of violence following the implementation of projects need to be considered when policy responses are planned. The research therefore points to the need to develop conflict-sensitive analyses when designing and implementing disaster risk management and climate programming.[41]

Future research should address resource management, conflict prevention and disaster risk reduction in an integrated manner

In conclusion, the underlying review illustrates the interplay between different mechanisms that link climate change and conflict. To further understand the relationship and advance policy guidance on how to mitigate conflict risks, future research should address resource management, conflict prevention and disaster risk reduction in an integrated manner. Future research needs to contribute in the following three key areas.

1. *Addressing spatial and temporal differences*. The impacts of climate change are expected to increase over time, but many climate-related disasters are seasonal and affect the dynamics of conflicts differently throughout the year. In addition, few studies address urban contexts despite increased urbanization and the vulnerability of urban centres in the region.

2. *Making use of contextual understanding*. Climate change and conflict events have different effects on different societies. It is therefore crucial to understand these context-specific differences in order to enable tailored responses.[42] These should include local and marginalized communities. To provide contextually adequate responses that empower vulnerable groups, it is important to assess the needs, vulnerabilities and resilience of affected communities.

3. *Taking account of institutional capacity and governance*. The transnational character of climate change provides new challenges, but also increased relevance, for institutions and organizations.[43] Where institutional capacity is low, there is an increased risk that aid will be mismanaged and the risk of conflict after a climatic event increases.[44] It is therefore important to analyse how local, national and regional institutions are developing their ability to deal with these risks.

[40] See Gawande, K. et al., 'Renewable natural resource shocks and conflict intensity: Findings from India's ongoing Maoist insurgency', *Journal of Conflict Resolution*, vol. 6, no. 1 (Jan. 2017), p. 140; Axbard (note 23); and Bagozzi (note 18).

[41] Walch (note 30); and Walch, C., 'Collaboration or obstruction? Rebel group behavior during natural disaster relief in the Philippines', *Political Geography*, vol. 43 (Oct. 2014), p. 40.

[42] Ayeb-Karlsson (note 25).

[43] Krampe, F., Scassa, R. and Mitrotta, G., 'Responses to climate-related security risks: Regional organizations in Asia and Africa', SIPRI Insights on Peace and Security no. 2018/2, Aug. 2018 (SIPRI: Stockholm, 2018); and Dellmuth, L. M. et al., 'Intergovernmental organizations and climate security: Advancing the research agenda', *WIREs Climate Change*, 13 Oct. 2017.

[44] Uson (note 33).

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