WEATHERING RISK

Non-State Armed Groups Operating in the Climate–Environment–Conflict Nexus

Recent Research Findings and Policy Responses

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1. Purpose and Framing

This discussion paper revisits and updates the analysis set out in adelphi's 2016 report *Insurgency, Terrorism and Organised Crime in a Warming Climate*.[1] That report was among the first to systematically map the connections between climate change, and the dynamics of a range of non-state armed groups (NSAGs) and other armed actors such as organised criminal networks. In practice, the boundaries between these types of actors are porous: a group classified as an insurgency may simultaneously run criminal enterprises, while militias formed for community defence can evolve into predatory armed actors.[2] Climate impacts cut across these categories, and increasingly shape the underlying drivers, tactics and dynamics of violent groups. For analytical clarity, this paper uses the term NSAG as its primary category, recognising that the available empirical evidence is concentrated here. Where relevant, it draws attention to the fact that many of the dynamics described, particularly around resource exploitation and environmental crime, are also characteristic of organised criminal networks, and that several of the groups discussed are hybrid actors that blur the line between political insurgency and organised crime. The analysis and recommendations should be read with this overlap in mind.

Since 2016, the evidence base on these connections has expanded considerably. In the last decade, there have been a number of robust qualitative and quantitative studies that have examined the relationship between climatic shifts and events, and conflict dynamics. Mixed-methods field research, including large-scale survey programmes by UNIDIR's Managing Exits from Armed Conflict (MEAC) initiative across the Lake Chad Basin, Colombia and Iraq, the adelphi-led *Shoring up Stability* study in the Lake Chad region, the *Africa Climate Security Risks Assessment* (ACRA), and practitioner consultations such as the Global Counterterrorism Forum's Initiative on Addressing the Nexus Between Climate Change and Violent Extremism Conducive to Terrorism have moved the field from broad plausibility arguments towards granular, contextualised evidence.

In addition, the climate security discourse itself has evolved. While climate change remains a central lens, research and policy discussions increasingly situate it within a broader set of environmental and natural resource dynamics. These wider dynamics have long featured in the analysis of NSAGs: armed groups had been exploiting mineral resources, illicit timber and charcoal trades, and fossil fuel revenues well before climate change entered the analytical frame. What has changed is the recognition that climate impacts do not operate in isolation but compound and interact with these pre-existing patterns of resource exploitation and environmental stress. Moreover, recent research has highlighted that security policy and resource management (or the lack thereof) can exacerbate the impact of climatic shifts and events, and make it harder for people to sustainably exit or avoid conflict.[3] For example, UNIDIR research in Iraq found that local security actors prohibited returnees from Syria – often perceived as having been affiliated with the Islamic State in the Levant (ISIL) – from transporting fertiliser due to its potential use in improvised explosives. This restriction, combined with returnees' financial constraints and climate-driven land degradation, limited their ability to resume agricultural livelihoods.[4] A similar mechanism was observed around Lake Chad, where security actors limited the access and movement of local communities to agricultural and fishing areas, making them less able to cope with climatic extremes.[5] This broader understanding informs the analysis presented here.

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1 Nett, K. and Rüttinger, L. (2016). *Insurgency, Terrorism and Organised Crime in a Warming Climate.* Berlin: adelphi.

2 For an emerging body of work on the broader connections between climate stress and criminal activity beyond organised armed groups, including wildlife trafficking, drug markets and smuggling networks, see Schwartzstein, P. (2024). *Climate Change and Crime: A Big, Bad, Largely Overlooked Nexus.* Briefer No. 67. Center for Climate and Security.

3 Nagarajan, C., Batault, F., O'Neil, S., Van Broeckhoven, K., Hoinathy, R., Delanga, C. and Douvagaï. (2025). *Climate, Insecurity and Displacement: Triple Barriers to the Reintegration of Former Boko Haram Associates.* Geneva: UNIDIR; Caus, J., Althuis, J., Hoene, M., O'Neil, S., Sauer, T., Sammarraie, M., Alzuber, N. and Cedillo Bernal, A. (2026). *Return to Dry Lands: How Agricultural Decline Impedes Post-Conflict Reintegration in Iraq.* Geneva: UNIDIR.

4 Caus, J., Althuis, J., Hoene, M., O'Neil, S., Sauer, T., Sammarraie, M., Alzuber, N. and Cedillo Bernal, A. (2026). *Return to Dry Lands: How Agricultural Decline Impedes Post-Conflict Reintegration in Iraq.* Geneva: UNIDIR.

5 Vivekananda, J., Wall, M., Sylvestre, F., Nagarajan, C. and Brown, O. (2019). *Shoring up Stability: Addressing Climate and Fragility Risks in the Lake Chad Region*. Berlin: adelphi.

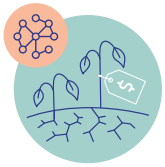
This paper distils the findings from recent research along a set of climate and environmental risk ***pathways*** (see box below) that explain how climate change can contribute to the onset or continuation of conflict, and interact with specific conflict dynamics and belligerent decisions. The paper then identifies evidence-based responses to be considered given the recent evidence on the connections between climate change and conflict.

WHAT ARE CLIMATE AND ENVIRONMENTAL RISK PATHWAYS?

The term pathway is based on the existing climate and environmental security literature, and used, for example, in the Weathering Risk methodology. Pathways describe the causal and conditional chains through which climate and environmental pressures connect to conflict dynamics, moving beyond simple correlation to trace the economic, political, social and environmental mechanisms through which these connections operate.

The term is not without limitations: it can imply a linearity and directionality for which there is yet to be solid evidence. In practice, these pathways include feedback loops, and are iterative, mutually reinforcing and highly context dependent. Alternative framings – such as drivers, risk factors and nexus dimensions – capture some of these dynamics but carry their own analytical baggage. We retain pathways as a useful shorthand, while acknowledging that the relationships described rarely operate in isolation or in sequence.

2. Climate and Environmental Risk Pathways



Climate change and environmental pressures create conditions from which NSAGs can emerge, sustain and grow

The original adelphi report argued that climate change functions as a risk for compounding pre-existing vulnerabilities, contributing to conflict and fragility, and the conditions from which NSAGs can emerge. Recent evidence has further substantiated and deepened this finding.

The evidence linking climate and environmental stress to conflict is now substantial, although it operates through different mechanisms. Some studies have explored direct correlations,[6] including one study that found that increasing global greenhouse gas emissions are associated with increased occurrences of low-intensity and internationalised intrastate wars in developing countries.[7] However, most research has focused on indirect pathways, particularly the impacts of adverse environmental conditions on economic outcomes, such as agricultural production and food prices, and on migration,[8] which in turn can create conditions conducive to violence. For example, one study has shown that anomalous climatic events in Africa correlate with higher food prices and that, in turn, higher food prices are associated with higher rates of political violence.[9] Another study used Afrobarometer data to demonstrate that, among individuals living in drought-affected areas in Africa, those who experienced a deterioration in living conditions were more likely to report that they would potentially participate in political violence than those whose living conditions had stayed the same or recently improved.[10]

6 Sakaguchi, K., Varughese, A. and Auld, G. (2017). "Climate Wars? A Systematic Review of Empirical Analyses on the Links between Climate Change and Violent Conflict," *International Studies Review* 19, No. 4.

7 Ko, J., Lee, H. F. and Leung, C. K. (2024). "War and Warming: The Effects of Climate Change on Military Conflicts in Developing Countries (1995–2020)." *Innovation and Green Development* 3, No. 4.

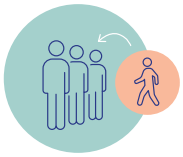
8 Koubi, V. (2019). "Climate Change and Conflict." *Annual Review of Political Science* 22.

9 Raleigh, C., Choi, H. J. and Kniveton, D. (2015). "The Devil Is in the Details: An Investigation of the Relationships between Conflict, Food Price and Climate across Africa," *Global Environmental Change* 32.

10 Vestby, J. (2019). "Climate Variability and Individual Motivations for Participating in Political Violence," *Global Environmental Change* 56.

Climate-driven fragility contributes to conflict-prone environments in which NSAGs proliferate most easily. Fragility and conflict erode state authority and produce ungoverned or under-governed spaces in which NSAGs can recruit, operate and extract resources with relative impunity. They generate mass displacement, severing social ties and creating large populations with diminished livelihood options. They break down customary mechanisms for managing resource competition that have historically contained intercommunal tensions. Furthermore, they normalise violence as a means of dispute resolution, making armed mobilisation more likely.[11]

It is important to note that climate and environmental pressures – such as droughts, floods, shifting seasons, rising temperatures and biodiversity loss – do not generate armed group activity on their own, even when studies demonstrate direct correlation. Rather research highlights how they interact with certain conditions and intervening factors – including governance deficits, marginalisation, livelihood insecurity and social tensions – to create the conditions in which NSAGs can emerge, grow and operate.[12] Furthermore, these conditions are highly context-specific, and differ within and across countries. The following three pathways explore different ways NSAGs exploit these conditions to their advantage.



NSAGs actively use climatic events and climatic change-related hardships to grow and maintain their ranks

The original adelphi report specifically argued that one of the multiple ways that climate change can contribute to armed group onset and activity was the potential for climatic shifts and events to worsen livelihood insecurity. In turn, this heightens vulnerability to recruitment by NSAGs, which exploit sociopolitical grievances and economic hardship by offering alternative sources of income and support. A growing body of evidence gathered since then broadly confirms this, while adding important nuance. Recent research has shown that NSAGs are not merely passive beneficiaries of climate-driven instability (e.g. merely accepting people who are propelled to join their ranks), but that armed groups actively adapt their strategies to exploit climate stress.

In the last decade, there has been growing evidence showing that escalating environmental pressures and weather-induced disasters intensified by climate change can create livelihood challenges, and generate frustrations and tensions among affected communities. These local grievances can influence people's decisions to join NSAGs. For example, in the Lake Chad Basin, adelphi's *Shoring up Stability* study documented how climate variability compounds core conflict drivers, creating a "climate-conflict trap" in which environmental stress and violence reinforce each other. Negative experiences with state interventions deepen local grievances, which armed opposition groups exploit in their efforts to recruit and retain members. UNIDIR's survey data corroborates this pattern at the individual level: among former Boko Haram associates across the Lake Chad Basin, who reported climate-related livelihood difficulties before they became associated with the group, a notable percentage said these difficulties were a factor in their recruitment.[13] Follow-up interviews found that the specific causal pathways varied drastically. One man formerly associated with Boko Haram in North East Nigeria explained, **"Heavy rainfall and flooding made it impossible to farm on the lands**

11 Nett, K. and Rüttinger, L. (2016). *Insurgency, Terrorism and Organised Crime in a Warming Climate*. Berlin: adelphi; Nagarajan, C., Binder, L., Destrijcker, L., Michelini, S., Rüttinger, L., Sangaré, B., Šedová, B., Vivekananda J. and Zaatour, R. (2022). *Weathering Risk Climate, Peace and Security Assessment: Mali*. Berlin: adelphi; Rüttinger, L., Destrijcker, L., Morales-Muñoz, H., Foong, A., Gomolka, J., Binder, L., Abdulkadir, T., Akosa, T., Belli, A., Brubacher, M., Dia, M., Guillier, M., Kadry, S., Kendyuio, B., Maviza, G., Moyo, C., Ndjekouneyoum, S., Ogallo, L., Saraka, M., Šedová, B. and Villa, V. (2024). *Weathering Risk: Africa Climate Security Risk Assessment*. Berlin: adelphi.

12 Nett, K. and Rüttinger, L. (2016). *Insurgency, Terrorism and Organised Crime in a Warming Climate*. Berlin: adelphi; Rüttinger, L., Destrijcker, L., Morales-Muñoz, H., Foong, A., Gomolka, J., Binder, L., Abdulkadir, T., Akosa, T., Belli, A., Brubacher, M., Dia, M., Guillier, M., Kadry, S., Kendyuio, B., Maviza, G., Moyo, C., Ndjekouneyoum, S., Ogallo, L., Saraka, M., Šedová, B. and Villa, V. (2024). *Weathering Risk: Africa Climate Security Risk Assessment*. Berlin: adelphi; Nagarajan, C., Batault, F., O'Neil, S., Van Broeckhoven, K., Hoinathy, R., Delanga, C. and Douvagaï. (2025). Climate, Insecurity and Displacement: Triple Barriers to the Reintegration of Former Boko Haram Associates. Geneva: UNIDIR.

13 UNIDIR/MEAC (2024). *Climate Change Is Driving People into Armed Groups: Five Takeaways*. Geneva: UNIDIR.

available to us. To be able to access good land, one had to join them."[14] Whereas another former associate said, **"… there was a sandstorm that removed the roof off my house and destroyed it. Life became really hard as a result of being displaced and I joined the group when the opportunity came along, thinking my life would be better."**[15]

These reflections highlight how climate change can intensify livelihood stresses in different and context-specific ways that influence people's trajectories into armed groups. In Colombia, UNIDIR's research found that it was not just climate change but also challenges created by human-induced environmental degradation (e.g. deforestation and mining) that contributed to recruitment into armed groups, particularly in rural areas.[16] In such cases, the feedback loop to climate change is reversed, creating a vicious cycle: extensive deforestation contributes to climate change by reducing the earth's capacity to absorb CO_2 emissions; in turn, the resulting warming temperatures create the conditions that make it easier to engage in deforestation activities.

Recent research has also focused on how these groups leverage the crises and challenges posed by climatic events and escalating environmental pressures to target specific communities for recruitment. For instance, the ACRA report documents patterns of climate-driven land and resource competition across the African continent, and ways in which NSAGs exploit these crises. It highlights that when livelihood sectors such as agriculture and pastoralism come under intense pressure, armed groups provide access to illicit income-generating activities and other financial incentives to attract new recruits. Locations affected by weather-induced disasters have been particularly targeted by NSAGs, which leverage the heightened vulnerability of impacted populations to build political support.[17] In a study of Pakistan's Sindh province, which had been hit by extreme floods, several interviewees expressed willingness to vote for Jamaat-ud-Dawa, if the Islamist group contested the next elections, because the group had provided them with food relief and tents after the floods.[18] Beyond recruitment, NSAGs are also able to *maintain* their ranks because the combination of climate change and insecurity can make it difficult to disengage from conflict. In the Lake Chad region, UNIDIR found that former Boko Haram associates often returned to communities to find their land degraded or used by others, and their animals sold or killed.[19] Those who exited Boko Haram faced a heightened risk of being targeted by their former comrades, which limited their ability to work the fields or migrate to parts of the country where environmental conditions were better but Boko Haram was present. As one community leader described the return process, **"when you come back here, you come with nothing. The resources you left here have disappeared […] which is why they [former Boko Haram associates] are suffering more than the other members of the community."**[20] As a result of economic hardship, former associates lacked the capital required to re-establish their agricultural livelihoods, let alone to adopt the resilience-building measures used by their unaffiliated, non-displaced peers (e.g. buying fertiliser to cultivate depleted lands). As a result, many returnees engaged in negative coping strategies, such as cutting trees to sell as firewood or charcoal, or turning to criminality, which generated frustration and tensions with the communities into which they were reintegrating.[21] NSAGs benefit from existing barriers to returnees' reintegration, which are reinforced by climate change and which can prevent mass exits from their ranks or contribute to re-recruitment.

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14 Benjamin, A. and Batault, F. (2025). *Farming Amid Conflict: Agricultural Challenges and Their Impact on the Reintegration of Former Boko Haram Associates in the North East of Nigeria.* Geneva: UNIDIR, p. 2.

15 UNIDIR/MEAC (2024). *Climate Change Is Driving People into Armed Groups: Five Takeaways*. Geneva: UNIDIR.

16 Cárdenas, J., Downing, C. and Vélez, J. (2021). *Climate-Driven Recruitment and Other Conflict Dynamics in Colombia.* New York: United Nations University.

17 Rüttinger, L., Destrijcker, L., Morales-Muñoz, H., Foong, A., Gomolka, J., Binder, L., Abdulkadir, T., Akosa, T., Belli, A., Brubacher, M., Dia, M., Guillier, M., Kadry, S., Kendyuio, B., Maviza, G., Moyo, C., Ndjekouneyoum, S., Ogallo, L., Saraka, M., Šedová, B. and Villa, V. (2024). *Weathering Risk: Africa Climate Security Risk Assessment*. Berlin: adelphi.

18 Siddiqi, A. (2014). "Climatic Disasters and Radical Politics in Southern Pakistan: The Non-Linear Connection," *Geopolitics* 19, No. 4, pp. 895 and 897.

19 Nagarajan, C., Batault, F., O'Neil, S., Van Broeckhoven, K., Hoinathy, R., Delanga, C. and Douvagaï. (2025). *Climate, Insecurity and Displacement: Triple Barriers to the Reintegration of Former Boko Haram Associates.* Geneva: UNIDIR.

20 Nagarajan, C., Batault, F., O'Neil, S., Van Broeckhoven, K., Hoinathy, R., Delanga, C. and Douvagaï. (2025). *Climate, Insecurity and Displacement: Triple Barriers to the Reintegration of Former Boko Haram Associates.* Geneva: UNIDIR, p. 11.

21 Nagarajan, C., Batault, F., O'Neil, S., Van Broeckhoven, K., Hoinathy, R., Delanga, C. and Douvagaï. (2025). *Climate, Insecurity and Displacement: Triple Barriers to the Reintegration of Former Boko Haram Associates.* Geneva: UNIDIR, pp. 13–14.

NSAGs strategically leverage the effects of climate-induced disasters to implement their operations more effectively and advance their strategic objectives

NSAGs also strategically leverage the effects of climatic shifts and events in particular climate-induced disasters to implement their operations more effectively. For example, one study on the Philippines found that, on a year-to-year basis across four insurgencies, precipitation shocks and wetter conditions were associated with a significant rise in the number of attacks (as well as battle deaths and casualties) in conflicts between insurgent groups and government forces in the 2000s.[22] It was hypothesised that wetter conditions contributed to enhanced insurgent capacity (e.g. access to more food for fighters and enhanced vegetation cover for covert operations). Other research has found that climate conditions shape armed groups' tactical and operational decisions, with the ACRA report showing how climate impacts increasingly influence when, where and how armed groups operate. For example, wetter conditions have been reported to provide better camouflage for NSAGs and hinder military operations against them.[23] In the Colombian Amazon, UNIDIR found that FARC-EP dissident factions accelerated deforestation during the 2023–24 El Niño period, when extreme drought created favourable conditions for land clearance and burning.[24] In some cases, climatic challenges have worked in favour of NSAGs, as their adversaries have been less able to adapt their operations to these harsh conditions. Insurgents' ability to adapt to both climate and security challenges has allowed them, deliberately or not, to take greater advantage of these conditions than their opponents.

It must be acknowledged that NSAGs are not immune to difficult climatic conditions and their operations may also suffer as a result of these challenges. For example, one study showed that in the Philippines, two typhoons in 2012 and 2013 weakened the recruitment capacity of the New People's Army (NPA), a rebel group, by forcing the rebels to concentrate on overcoming their own food scarcity and rebuilding destroyed camps.[25] NPA's recruitment tactics in areas under their control were further disrupted by an influx of humanitarian relief providers, including armed forces, international organisations and NGOs responding to the typhoons, who monitored and raised awareness about armed group recruitment in disaster-displaced camps.[26] This shows that, although NSAGs can strategically exploit harsh climatic conditions in their favour, they are not always successful in doing so, and indeed can be negatively impacted just like other populations and organisations. It also highlights the importance of state presence in climate–security dynamics. In this specific case, the presence of state actors disrupted NPA's activity in disaster-affected areas. This example, combined with others where climate shocks were met with little or no government response and NSAGs stepped into the void, highlights how climatic events and governance failures intersect to create conflict liabilities.

In fact, NSAGs often leverage weather-induced disasters and environmental challenges to build legitimacy and consolidate governance, as part of their state-building objectives. The ACRA report documents how across the African continent NSAGs have achieved this by offering services that states have failed to deliver. In Somalia, Al-Shabaab has provided cash and humanitarian aid to drought-affected communities, filling governance vacuums created by the absence of state services. In central Mali, armed groups have established themselves as providers of dispute resolution for conflicts over natural resources, as well as suppliers of food and water. For instance, Katiba Macina, an al-Qaeda-affiliated group, has reportedly built wells and provided communities with food "to

22 Eastin, J. (2018). "Hell and High Water: Precipitation Shocks and Conflict Violence in the Philippines," *Political Geography* 63.

23 Rüttinger, L., Destrijcker, L., Morales-Muñoz, H., Foong, A., Gomolka, J., Binder, L., Abdulkadir, T., Akosa, T., Belli, A., Brubacher, M., Dia, M., Guillier, M., Kadry, S., Kendyuio, B., Maviza, G., Moyo, C., Ndjekouneyoum, S., Ogallo, L., Saraka, M., Šedová, B. and Villa, V. (2024). *Weathering Risk: Africa Climate Security Risk Assessment.* Berlin: adelphi, p. 127.

24 Vélez, J., Aguirre, Á., Rivas, S. and O'Neil, S. (2025). *Armed Group Responses to Climate Shocks: A Study of FARC-EP Dissident Activities in the Colombian Amazon During an El Niño Year.* Geneva: UNIDIR, p. 20.

25 Walch, C. (2018). "Weakened by the Storm: Rebel Group Recruitment in the Wake of Natural Disasters in the Philippines," *Journal of Peace Research* 55, No. 3.

26 Walch, C. (2018). "Weakened by the Storm: Rebel Group Recruitment in the Wake of Natural Disasters in the Philippines," *Journal of Peace Research* 55, No. 3, p. 345.

ensure the collaboration of villages," taking advantage of food insecurity and water scarcity resulting from harsh environmental conditions.[27] In the Central African Republic, armed groups regulate pastoralism through systems of illegal taxation along key transhumance corridors. Across these cases, NSAGs have used climate-driven challenges to simultaneously generate income to sustain their activities and to position themselves as alternative governance providers. This dual purpose is also evident in Colombia, where UNIDIR found that FARC-EP dissident groups established a land registry in San José de Guaviare in the name of "continuing revolutionary agrarian reform," which gave them greater insight into economic activity and land use in territory under their control, enhancing their regulatory and taxation capacity.[28] Overall, recent research findings indicate that NSAGs often actively exploit climate-related challenges to sustain and advance their strategic objectives.

NSAGs weaponise natural resources to advance their aims

Beyond taking advantage of climate shocks, NSAGs also instrumentalise natural resources to advance their military and political objectives. As the original adelphi report argues, NSAGs use natural resources as tools of coercion and control, and even as weapons of war. For example, after seizing the Fallujah Barrage in April 2014, ISIL opened the floodgates, causing the reservoir to overflow and flood approximately 500 km^2 of surrounding farmland, displacing an estimated 60,000 civilians, while simultaneously cutting off water supply to millions of people in downstream cities.[29] In Libya, during the civil conflict, armed groups repeatedly targeted and shut down the Great Man-Made River, a vast pipeline system that supplies around 70 per cent of the country's freshwater.

A recent study argues that NSAGs decide to destroy or weaponise natural resources for a multitude of reasons, including to destroy enemy assets, gain territorial control, inhibit enemy advances, and to control and punish civilian populations.[30] In practice, it is often difficult to discern whether NSAGs target natural resources specifically to coerce enemy or civilian populations, or whether this is an unintended or secondary effect of tactical military strategy. In several cases, however, evidence confirms that NSAGs have deliberately used natural resources as weapons of war. For instance, in December 2014, ISIL contaminated drinking water with crude oil in Iraq's Salah Al-Din Governorate, which was experiencing drought and water shortages, and, via a video message, urged its followers to poison the drinking water of its enemies wherever possible.[31]

The instrumentalisation of natural resources by NSAGs is not limited to the combat field. NSAGs have also used natural resources as bargaining chips during negotiations with their opponents. For example, in Colombia, UNIDIR found that FARC-EP dissident groups leveraged deforestation as a tool to pressure the government during peace negotiations in 2024. When they perceived that the government had failed to comply with their demands, they allowed more deforestation in the Amazon. As one community leader put it, **"The issue of allowing logging to increase … is to demonstrate to the government that [FARC-EP dissidents] can control this issue, and that … if they tell the people to cut down, they can cut down … that they are the ones who control the territory."**[32] As climate change places additional strain on the availability of certain natural resources and global attention to environmental protection grows, there is the possibility that this type of exploitation and weaponisation might become an increasingly important strategy of NSAGs.

27 Hegazi, F., Krampe, F. and Seymour Smith, E. (2021). *Climate-Related Security Risks and Peacebuilding in Mali*. SIPRI Policy Paper 60, pp. 24–25.

28 Vélez, J., Aguirre, Á., Rivas, S. and O'Neil, S. (2025). *Armed Group Responses to Climate Shocks: A Study of FARC-EP Dissident Activities in the Colombian Amazon During an El Niño Year.* Geneva: UNIDIR, p. 22.

29 Al-Marashi, I. (2015). "The Dawning of Hydro-Terrorism," *Al-Jazeera*.

30 Feuer, A. (2023). "Environmental Warfare Tactics in Irregular Conflicts," *Perspectives on Politics* 21, No. 2.

31 Lossow, T. (2016). "The Rebirth of Water as a Weapon: IS in Syria and Iraq," *The International Spectator* 51, No. 3, p. 89.

32 Vélez, J., Aguirre, Á., Rivas, S. and O'Neil, S. (2025). *Armed Group Responses to Climate Shocks: A Study of FARC-EP Dissident Activities in the Colombian Amazon During an El Niño Year.* Geneva: UNIDIR, p. 10.

NSAGs drive environmental degradation and contribute to climate change

The causal arrow also runs in the other direction. NSAGs are significant agents of environmental destruction, while generating revenue through illegal resource extraction. This dimension of climate–NSAG dynamics was not covered in the original adelphi report. However, growing evidence has since demonstrated the importance of understanding how NSAGs contribute to climate change and environmental degradation more broadly. One recent study highlights the extent to which armed groups engage in activities that are harmful to the environment, estimating that 38 per cent of the illegal revenues of NSAGs are from environmental crimes.[33] This dynamic exists around the world: the ACRA report identifies illegal resource extraction as an important revenue stream for armed groups across the African continent, with the Congo Basin, the world's last remaining net carbon sink, a particular hotspot. In Somalia, Al-Shabaab controls revenues from charcoal production. In the Central Sahel, violent extremist groups have expanded their control over smuggling and trafficking networks alongside natural resource sectors, including pastoralism, forestry and mining.
In many cases, environmental degradation is more than a byproduct of the illicit activities of NSAGs, it is a key part of their financing models. In the Colombian Amazon, UNIDIR has documented how FARC-EP dissident groups have built a diversified economic model around regulating and profiting from deforestation, imposing taxes on land transactions, logging, cattle ranching and milk production.[34] In fact, several scholars have reported a sharp increase in deforestation in the Colombian Amazon after FARC-EP's withdrawal in 2016, largely involving FARC-EP dissidents and other NSAGs.[35] As explained further in the next section, this example illustrates the variation in how NSAGs view, protect and exploit the environment. In some cases, as with some of the dissident groups in Colombia, their position towards the environment produces a feedback loop: armed group-driven environmental degradation reduces community resilience to climate impacts, which deepens the vulnerabilities that armed groups exploit.

NSAGs can contribute to environmental protection and climate change adaptation

Although NSAGs often exploit and destroy natural resources in different ways, they also actively manage and at times protect the environment amid climate-related pressures. This dynamic has been highlighted in a recent study on "rebel environmental governance," which argues that rebel groups often actively respond and adapt to climate change as part of their local governance efforts.[36] The study found that 43 per cent of the rebel groups examined had engaged in at least one behaviour related to conservation, provision of water or food security, agricultural management, migration assistance, or disaster response, while 23 per cent had used some type of environmental or climate-related rhetoric.[37]

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33 Nellemann, C., Henriksen, R., Pravettoni, R., Stewart, D., Kotsovou, M., Schlingemann, M.A.J, Shaw, M. and Reitano, T. (eds). (2018). *World Atlas of Illicit Flows. A RHIPTO–INTERPOL–GI Assessment*. RHIPTO–Norwegian Center for Global Analyses, INTERPOL and the Global Initiative Against Transnational Organized Crime.

34 Vélez, J., Aguirre, Á., Rivas, S. and O'Neil, S. (2025). *Armed Group Responses to Climate Shocks: A Study of FARC-EP Dissident Activities in the Colombian Amazon During an El Niño Year.* Geneva: UNIDIR.

35 Murillo-Sandoval, P. J., Van Dexter, K., Van Den Hoek, J., Wrathall, D. and Kennedy, R. (2020). "The End of Gunpoint Conservation: Forest Disturbance after the Colombian Peace Agreement," *Environmental Research Letters* 15; Van Dexter, K. and Visseren-Hamakers, I. (2020). "Forests in the Time of Peace," *Journal of Land Use Science* 15, No. 2–3; Clerici, N. Armenteras, D., Kareiva, P., Botero, R., Ramírez-Delgado, J. P., Forero-Medina, G., Ochoa, J., Pedraza, C., Schneider, L., Lora, C., Gómez, C., Linares, M., Hirashiki, C. and Biggs, D. (2020). "Deforestation in Colombian Protected Areas Increased during Post-Conflict Periods," *Scientific Reports* 10.

36 Gallagher Cunningham, K., Gentil-Fernandes, L., Gilmore, E., Huang, R., Jung, D. F. and Loyle, C. E. (2025). *Rebel Governance in the Age of Climate Change*. Cambridge: Cambridge University Press.

37 Gallagher Cunningham, K., Gentil-Fernandes, L., Gilmore, E., Huang, R., Jung, D. F. and Loyle, C. E. (2025). *Rebel Governance in the Age of Climate Change*. Cambridge: Cambridge University Press, pp. 29 and 31.

Scholars have offered several explanations for why NSAGs decide to engage in environmental protection. Some have suggested that rebel groups do so partly to enhance their local and international legitimacy, and showcase their capacity to govern as viable state alternatives.[38] For example, during COP26, the Polisario Front released an unofficial climate plan for the Sahrawi people of Western Sahara, detailing the climate change mitigation and adaptation measures it wanted to adopt. Another argument is that NSAGs protect the environment for tactical reasons, including using forests for camouflage and hiding.[39] In Colombia, the FARC-EP prohibited deforestation and restricted land use in several areas under their control. This practice, often described as "gunpoint conservation," was important in part because the FARC-EP relied on densely forested areas to hide themselves and their illicit drug trade from counter-insurgency operations. As one local social leader in the Andes–Amazon Transition Belt explained, **"Nobody entered the jungle because the guerrillas existed, they [the FARC-EP] did not let people enter because the jungle was useful for them, but as the guerrillas left the campesinos are entering the jungle [...] knocking down trees to make farms for cattle ranching."**[40] Recognition that NSAGs' environmental governance can have positive spillover effects for climate action has prompted growing interest in exploring the opportunities and risks associated with engaging these groups to advance climate mitigation and adaptation strategies.

The climate–environment–NSAG nexus has differential and localised impacts, which are insufficiently understood and remain un- or under-addressed

Climate impacts, environmental stressors and NSAG dynamics have highly differentiated impacts across populations and places. Yet, these dimensions remain among the least developed in both research and policy. Gender is a particularly important lens, but age, livelihood, displacement status, and local social and environmental conditions also shape how individuals and communities experience climate- and conflict-related risks. Women and men experience climate- and environment-related stresses through different channels: women often bear disproportionate burdens as primary caregivers and food providers, while discriminatory land tenure norms limit their adaptive options. At the same time, women face a greater risk of abuse, gender-based violence, trafficking and human rights violations in situations of disaster and displacement.

In the Lake Chad region, the *Shoring up Stability* report found that gender and age dynamics operate as armed group mobilising factors in different ways for women, men and young people. Women and girls have joined armed opposition groups seeking relative empowerment, status and religious knowledge or a role in political and societal change – motivations that differ significantly from the economic and security drivers more commonly documented for men and boys. Meanwhile, climate-driven male out-migration to urban centres can simultaneously increase women's responsibilities and agency in rural areas, and heighten their vulnerability to violence and exploitation, while exposing young males to new forms of urban violence and crime. In Chad and Cameroon, UNIDIR research found that former Boko Haram associates were perceived to face a heightened risk of being killed by the group if found working in the fields, whereas women and girls were believed to face the risk of being abducted or sexually assaulted rather than killed. As a result of this perceived threat differential, many former male associates stayed back, while women in their family took over farming (in addition to collecting water and firewood).[41] Interviews with these women found that they were compelled to take these risks due to not having other livelihood options, suggesting once more that

38 Gallagher Cunningham, K., Gentil-Fernandes, L., Gilmore, E., Huang, R., Jung, D. F. and Loyle, C. E. (2025). *Rebel Governance in the Age of Climate Change*. Cambridge: Cambridge University Press.

39 Feuer, A. (2023). "Environmental Warfare Tactics in Irregular Conflicts," *Perspectives on Politics* 21, No. 2; Gallagher Cunningham, K., Gentil-Fernandes, L., Gilmore, E., Huang, R., Jung, D. F. and Loyle, C. E. (2025). *Rebel Governance in the Age of Climate Change*. Cambridge: Cambridge University Press.

40 Murillo-Sandoval, P. J., Van Dexter, K., Van Den Hoek, J., Wrathall, D. and Kennedy, R. (2020). "The End of Gunpoint Conservation: Forest Disturbance after the Colombian Peace Agreement," *Environmental Research Letters* 15, p. 5.

41 Nagarajan, C., Batault, F., O'Neil, S., Van Broeckhoven, K., Hoinathy, R., Delanga, C. and Douvagaï. (2025). *Climate, Insecurity and Displacement: Triple Barriers to the Reintegration of Former Boko Haram Associates*. Geneva: UNIDIR.

climatic pressures compound gendered challenges related to insecurity. Moreover, because climate change and insecurity reduced agricultural production, many male former associates were unable to provide for their households and thus failed to meet societal norms of breadwinner masculinity, which led in some cases to heightened frustrations and even domestic violence.[42] These differential risks have received insufficient attention, despite their scale and the diversity of populations affected, including different communities in the same region, and the women, men, girls, boys and young people within them.

Responses to NSAGs and to climate–environmental challenges can exacerbate the problem when they lack conflict and climate sensitivity

One of the most consistent findings across the Lake Chad Basin, Colombia and the Sahel is that well-intentioned and often siloed security responses, environmental enforcement, and climate adaptation and development programming can make things worse. On the security side, the *Shoring up Stability* study documented how heavily militarised counter-insurgency approaches in the Lake Chad region directly undermined livelihoods: militaries restricted fishing and cash crop cultivation in areas near the lake and banned or destroyed tall crops, arguing that they might provide concealment for armed actors. These restrictions compounded climate-related livelihood pressures and drove some individuals back towards the very groups they had left. In Chad and Cameroon, UNIDIR reinforced this finding, concluding that farming restrictions in the name of security – including fertiliser bans – severely limited the economic reintegration prospects of former associates, contributing to conditions conducive to re-recruitment.[43] Likewise, peacebuilding initiatives – including disarmament, demobilisation and reintegration (DDR)-like programmes that try to support ex-combatants and former armed group associates in their transition to civilian life – were rarely climate sensitive.[44] This meant that the livelihoods training and assistance provided by these programmes did not necessarily align with the economic or environmental realities facing returnees, undermining the potential efficacy of this support.

On the environmental and climate side, action designed from a purely technical standpoint can produce unintended consequences. Smart agriculture initiatives, for instance, may disrupt the delicate balance between herders and farmers if the initiatives fail to account for shared land use patterns and pastoralist mobility. Conservation efforts can empower state actors to restrict community access to resources, generating the kind of grievances that armed groups readily exploit. In Colombia, government-led anti-deforestation operations disproportionately targeted small-scale farmers rather than the armed groups and commercial interests driving large-scale land conversion, deepening local resentment.[45] As recent research has highlighted, governance, security, economics, climate change and conflict interact in powerful ways, and preventing and mitigating their combined effects requires a cross-sectoral response.

42 Nagarajan, C., Batault, F., O'Neil, S., Van Broeckhoven, K., Hoinathy, R., Delanga, C. and Douvagaï. (2025). *Climate, Insecurity and Displacement: Triple Barriers to the Reintegration of Former Boko Haram Associates.* Geneva: UNIDIR, pp. 13 and 22.

43 Nagarajan, C., Batault, F., O'Neil, S., Van Broeckhoven, K., Hoinathy, R., Delanga, C. and Douvagaï. (2025). *Climate, Insecurity and Displacement: Triple Barriers to the Reintegration of Former Boko Haram Associates.* Geneva: UNIDIR.

44 Nagarajan, C., Batault, F., O'Neil, S., Van Broeckhoven, K., Hoinathy, R., Delanga, C. and Douvagaï. (2025). *Climate, Insecurity and Displacement: Triple Barriers to the Reintegration of Former Boko Haram Associates.* Geneva: UNIDIR, p. 30.

45 Vélez, J., Aguirre, Á., Rivas, S. and O'Neil, S. (2025). *Armed Group Responses to Climate Shocks: A Study of FARC-EP Dissident Activities in the Colombian Amazon During an El Niño Year.* Geneva: UNIDIR, p. 7.

3. Considerations for a More Integrated, Informed and Inclusive Response

The evidence reviewed in this paper points to a fundamental conclusion: climate, environmental and NSAG-related dynamics are deeply interconnected and cannot be addressed effectively through isolated sectoral interventions. While contexts differ, the patterns identified suggest three broad priorities for future policy, programming, research and assessment. These should be understood as directions for further development and debate rather than prescriptive recommendations.

Towards a More Integrated Response

The evidence demonstrates that interventions addressing climate, environmental and NSAG-related challenges must move beyond single-sector approaches. At a minimum, this requires climate sensitivity in conflict-related interventions, and conflict sensitivity in climate, environmental and development programming. However, going beyond do-no-harm to integrate elements of climate and environmental programming into peacebuilding and conflict prevention, and initiatives focused on preventing and countering violent extremism (P/CVE) can improve effectiveness and generate significant co-benefits. For example, reintegration programmes for former NSAG associates could combine traditional DDR support with climate-adaptive livelihoods training, including drought-resilient agriculture, renewable energy value chains and ecosystem restoration activities that strengthen both income security and environmental resilience. More broadly, given their potential to either mitigate or exacerbate vulnerabilities across these interconnected domains environmental governance initiatives, climate adaptation projects and disaster risk management (DRM) interventions should likewise integrate elements of peacebuilding and conflict prevention. For example, effective management of natural resources, disaster preparedness and climate adaptation can help rebuild trust between communities and public institutions, particularly where state absence or poor governance has enabled NSAG influence. As such, pro-peace DRM interventions could have significant benefits for reducing fragility and conflict risk.

Multi-directional sensitivity and mainstreaming for complex challenges is essential, but not sufficient for an effective response. To address the nexus between environmental, climate and conflict, genuinely integrated approaches that cut across institutional, sectoral and governance silos are needed. Climate adaptation, peacebuilding, humanitarian action, security interventions and development programming must be designed with greater coherence, and delivered through collaboration among actors operating at the local, national and international levels. The growing role of environmental crime in financing NSAGs further illustrates the need for integrated approaches. Addressing illicit mining, deforestation, charcoal production and wildlife trafficking requires closer collaboration between security, environmental, development and financial–governance actors, supported by conflict- and climate-sensitive analysis, and efforts to expand legitimate livelihood opportunities in affected communities. Another area that offers a tangible entry point for such integration concerns efforts to prevent conflict and/or violent extremism. Given demonstrated efforts by NSAGs to exploit challenges created by climatic and environmental stress, conflict prevention, and P/CVE initiatives can be paired with development and state-building efforts to promote climate-resilient livelihood opportunities and local natural resource management (NRM) dispute resolution mechanisms that reduce the capacity of armed groups to leverage local grievances and vulnerabilities. Integration cannot be seen narrowly as stronger horizontal coordination across policy communities, but must also include vertical integration between governments, local authorities, civil society organisations (CSOs) and affected communities.

Enhancing Understanding through Continuous Assessment and Learning

Although the evidence base has expanded considerably in the last decade, significant gaps remain regarding the evolving relationships between climate pressures, environmental change and NSAG activity. Additional robust evidence is required on the causal pathways, local dynamics and the effectiveness of different policy and programming responses in order to support effective and integrated prevention and mitigation measures.

Rather than relying solely on periodic standalone assessments, integrated climate, environmental and conflict analysis should become a routine feature of policy and programme design, implementation and evaluation. Integrated assessment frameworks – such as the Weathering Risk framework[46] – can help identify risks, anticipate unintended consequences and ensure interventions remain responsive as conditions change. This is particularly important given the rapidly evolving nature of both climatic and security environments.

Continuous learning approaches are, therefore, needed across research, programming and policymaking. Monitoring systems, adaptive management practices and regular stakeholder engagement can help ensure that interventions remain grounded in current realities rather than static assumptions. Shared analytical frameworks and terminology can also facilitate collaboration across traditionally separate communities of practice, including security, climate, humanitarian, development and environmental actors.[47]

Improved understanding is particularly important in areas where evidence remains limited, such as the relationship between environmental crime and NSAG financing, the long-term outcomes of climate-sensitive reintegration efforts, the peacebuilding potential of environmental governance interventions, and the gendered dimensions of climate–security responses. Closing these information gaps would strengthen both policy effectiveness and accountability.

Recognising Differential and Localised Impacts

In the drive to better understand and respond to the environmental, climate and conflict nexus, it is essential to recognise that climate and environmental changes do not affect all regions, communities or individuals in the same way. Efforts based on broad assumptions about vulnerability risk that overlook the highly uneven and context-specific nature of climate and environmental impacts, and NSAG dynamics risk producing one-size-fits-none approaches.

Research increasingly demonstrates that environmental changes can be highly localised, with neighbouring communities experiencing different levels of exposure and vulnerability depending on their livelihoods, resource access, geographic conditions and governance arrangements. Communities within the same ecological zone may experience markedly different impacts and adaptive capacities, highlighting the limitations of regional-level assessments that assume uniform vulnerability. Across settings, research has found that vulnerability to risks created by climate stress is shaped not only by exposure to environmental hazards but also by local institutions, livelihood systems, social inequalities and access to resources.[48]

Equally important, environment-, climate- and conflict-related pressures affect different population groups in distinct ways. Gender, age, livelihood, displacement status and social marginalisation frequently shape exposure to risk, access to resources and opportunities for adaptation or recovery.[49]

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46 For more information see https://weatheringrisk.org/en/methodology

47 For more information see https://weatheringrisk.org/en/publication/integration-dividend-how connecting-climate-environment-peace-and-security-multiplies

48 See, for example, McOmber, C. (2020). *Women and Climate Change in the Sahel. West African Papers No 27.* Paris: OECD Publishing.

49 See, for example, UNICEF (2026). *Water and Sanitation in the Sahel and Adaptation Strategy in the Context of Climate Change, WASH Reference Guide*. New York: UNICEF.

Women, men, girls and boys experience resource scarcity, climate shocks, recruitment pressures and reintegration challenges differently. Young people often face distinct livelihood and security vulnerabilities, and marginalised groups are frequently excluded from decision-making that determine resource allocation and adaptation priorities.

As a result, all assessments, research and interventions should incorporate context-specific and disaggregated analysis rather than relying on overly generalised assumptions. Additional research is needed to address persistent gaps in understanding gender- and age-specific climate- and environmental security implications. Inclusive approaches must also be applied to programming and policy planning by meaningfully involving women, young people and other marginalised groups in livelihoods, resource management and adaptation decisions. Similarly, initiatives addressing climate or environmental security should routinely incorporate gender- and age-related analyses into their risk assessments.

Ultimately, more effective responses to the climate–environment–NSAG nexus will depend on the ability of policymakers and practitioners to work across sectors and at multiple levels, continuously improve their understanding of evolving dynamics, and tailor interventions to the diverse realities experienced by different communities and population groups. Without such integrated, evidence-based and context-sensitive approaches, there is a significant risk that well-intentioned interventions will fail to address, or inadvertently reinforce, the complex challenges they seek to resolve.

4. The Way Forward

Since adelphi's initial assessment in 2016, the evidence base on climate change and NSAGs has grown substantially, but it has also revealed the complexity and context-specificity of the links involved. This paper synthesises what field research, survey data, practitioner experience and policy analysis across multiple regions over the last decade confirm: the nexus is real and consequential, but that it operates through indirect, mediated and locally specific pathways that resist simple generalisations. Recent research points to where understanding is maturing, where critical gaps remain, and where policy and practice most urgently need to catch up. Looking ahead, this agenda requires progress in three key areas:

1. **Deepening the evidence:** The evidence base, while growing, remains uneven. It is strong in certain geographies, such as the Lake Chad Basin, Colombia and the Horn of Africa, and thinner in others, including Southeast Asia and large parts of the Middle East. It is also under-developed on several critical dimensions. In addition to documenting the climate–recruitment link, research should expand understanding of how climate and environmental pressures interact with and amplify the full range of NSAG dynamics: financing, territorial control, governance provision and the deliberate use of environmental destruction or conservation as a strategic tool. Equally important is understanding how these dynamics differ across groups, regions and scales from local resource competition to transnational environmental crime networks. Particular attention is needed on gender-differentiated pathways, age- and livelihood-specific vulnerabilities, and the conditions under which armed groups consciously adapt to climate change versus opportunistically exploit immediate environmental conditions. Closing these gaps would not only improve analytical understanding but also strengthen the foundations for more effective and accountable policy responses.

2. **Building more integrated and inclusive responses:** Understanding the nexus is necessary but not sufficient. The evidence reviewed in this paper consistently demonstrates that siloed interventions, whether in the security, climate, development or environmental sectors, risk compounding the very vulnerabilities they seek to address. Operationalising dual climate and conflict sensitivity, as a standard requirement across programme design, is a minimum threshold. Security interventions must account for climate-driven livelihood pressures and climate adaptation, and DRM programmes must be designed with awareness of how they affect local power relations, resource access and the operational environment

of NSAGs. Beyond do-no-harm, genuinely integrated approaches are needed that pair conflict prevention and P/CVE initiatives with climate-resilient livelihood support, NRM and DRM to help address the conditions that armed groups exploit, while building more legitimate and inclusive governance. This integration must also be inclusive. Climate, environmental and conflict pressures affect different population groups in fundamentally different ways, and responses that rely on generalised assumptions about vulnerability will systematically miss those most at risk.

3. **Moving from comprehensive analysis to integrated action does not happen by itself.** It needs certain institutional conditions for integrated action. Building the architecture for a genuinely cross-sectoral response – through joint analytical capacities, shared training, and specific capacities and funding mechanisms that bridge the climate, development and security silos – remains one of the most significant and underinvested challenges in the field. This is not only a question of horizontal coordination across sectors, it also equally requires vertical integration between international actors, national governments, local authorities, CSOs and affected communities, so that responses are grounded in local realities. The Weathering Risk Peace Pillar, UNIDIR's MEAC initiative and the UN Climate Security Mechanism (in particular its climate security advisors) represent efforts that have begun to build this kind of architecture in practice: demonstrating that integration across analytical, programming and policy communities is not only possible but also generates greater impact than siloed approaches in some of the world's most fragile settings.

Based on these experiences and as a concrete next step, adelphi and UNIDIR propose an action agenda around three mutually reinforcing stages. First, contextualised climate–security risk assessments, drawing on the Weathering Risk methodology and MEAC survey data, should be conducted in priority contexts to generate the granular, field-grounded analysis that integrated programming requires. Second, these assessments should directly inform the design and implementation of integrated interventions, implemented in partnership with peacebuilding, humanitarian, development and security actors operating in the same contexts, and supported by rigorous measurement, evaluation and learning frameworks that capture results across climate, conflict and development dimensions. Third, the lessons emerging from implementation should be systematically consolidated, and shared with practitioners, policymakers and donors to build an evidence base that enables more targeted, adaptive and effective integrated programming over time. This is the kind of cycle, grounded in the field and connected to policy, that translates analytical progress into measurable change on the ground.

What is no longer in question is whether climate change and the environment matter for understanding and responding to NSAGs and conflict more broadly. The evidence for this is now substantial: climate change and the environment have indirect, context-specific and mediated pathways that interact with governance failures, political economies and pre-existing vulnerabilities to influence conflict dynamics. The more productive conversation now concerns how to translate this understanding into more effective and integrated practice across the environmental, climate, security and development sectors. This paper is intended as a contribution to that conversation and as a foundation for the deeper work that follows.

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