MINISTRY OF FOREIGN AFFAIRS OF DENMARK

UN

SeeD
CENTRE FOR SUSTAINABLE PEACE AND DEMOCRATIC DEVELOPMENT

DANISH MINISTRY OF DEFENCE

WFP/SOULEYMANE AG ANARA

Climate Change and Armed Groups

REPORT

Strengthening Disarmament, Demobilization, and Reintegration Practitioner's Analysis of and Response to the Links between Climate Change and Armed Group Recruitment Patterns

A SCORE Analysis in the Tillaberi Region in Niger

sipri
STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

FBA

KBK Omega
Etudes · Recherches · Formation · Services

ACKNOWLEDGEMENTS

The Disarmament, Demobilization and Reintegration (DDR) Section in the Office of Rule of Law and Security Institutions (OROLSI) in the Department of Peace Operations (DPO) would like to thank the Centre for Sustainable Peace and Democratic Development (SeeD) for developing this study with support from the Stockholm International Peace Research Institute (SIPRI), the Folke Bernadotte Academy (FBA), and the Climate, Peace & Security unit, in the Division for Policy, Evaluation and Training (DPET) in DPO.

The DDR Section would also like to thank the many partners who participated in key informant sessions and provided inputs to various iterations of the study. Lastly, this study was made possible through the kind and generous contribution of the Government of Denmark.

The Centre for Sustainable Peace and Democratic Development (SeeD) would like to thank its local partner (Omega KbK) for supporting the research process and contributing to its successful implementation.

SeeD – Centre for Sustainable Peace and Democratic Development:

Authors: Dr. Baldet Bertrand, Team Lead West Africa; Abdon Dominique Koko, Africa Programme Specialist

Contributors: Dr. Ilke Dagli Hustings, Director General; Dr. Orestis Panayiotou, Data Analyst & Researcher; Dr. Kando Serge Gbagbeu, Data Analyst; Sonia Dasse, Data Analyst
Thomas Kontogeorgos, Chief DDR Section; Barbra Lukunka, DDR Section; Lea Koudjou, DDR Section; Anne Novak, DDR Section; Markella Mantika, DDR Section; Thet-Htar Thet, DDR Section; Cassandra Mazzolini, DDR Section

Copy Editor: Sarah Courteau

Table of Contents

EXECUTIVE SUMMARY

1. There is a Climate Security Nexus at work in the Tillaberi region meaning that climate-related and security-related dynamics are correlated and reinforce each other. Therefore, even though climate change could not be identified as direct driver of recruitment, it operates as a catalyst, exacerbating conditions that heighten the susceptibility of individuals to join such groups. **It's crucial to shift the perspective from viewing climate change as a distant spectre to recognizing it as an active agent shaping pathways to vulnerability.**

2. Moreover, **Climate change repercussions do not occur arbitrarily; they are more pronounced in areas where people already contend with structural hardships**. Climate Change is an aggravating factor as it intensifies the vulnerability of individuals who are already fragile and besieged by disruptive dynamics. Notably, the severity of climate shocks in these areas not only compounds existing struggles but also presents an alarming opportunity for non-state armed groups to exploit the void left by weakened governance.

3. Even though the recruitment patterns are highly contextual and variate according to the socioecological situation of the community, it is important to consider the crucial role of **Natural Resources Management as it is strongly correlated with dynamics related to the social fabric**. Results highlight the fact that socially accepted Natural Resources regulations cannot be sustainable in the absence of strong social bonds, just as social cohesion cannot remain stable when natural resources regulatory mechanisms are considered unfair by some parts of the population.

4. Violent tendencies and the urge to possess weapons are two key predictors of vulnerability to recruitment. These two types of reactions seem to stem from despair and the absence of viable means to cope with various adversities, they should be considered through a lens which considers **the Institutional Deficits that undermine Human Security in the region**.

5. The environmental degradations triggered by the phenomenon can worsen existing conflicts and contribute to the emergence of new ones. The research aims to provide a better understanding of climate change's impact on social cohesion, human security, and individual violent tendencies. For those reasons, **DDR interventions, in their effort to reduce conflictual dynamics, should pay particular attention to the feedback loops and tipping points generated by climate change.**

6. The results suggest the need for a transversal and multidisciplinary approach that considers climatic stressors, societal dynamics, and individual psychological tendencies together. In this perspective, the DDR interventions should be framed through an **integrated approach covering Mental Health and Psychosocial Support (MHPSS), peacebuilding, and livelihood development**. The results of the research encourage the development of interconnected and cross-cutting interventions to strengthen and self-sustain Constructive Citizenship, Social Connectedness & Resilient Livelihoods.

INTRODUCTION: CLIMATE, CONFLICT AND THE TILLABERI REGION

1. Research Framework

Over the past few decades, researchers have diligently sought evidence to establish linkages between climate dynamics and local conflicts or war.[1] However, there remains a lack of consensus on exactly what those linkages are and how they play out.[2] The disparate findings can be attributed to poorly conceived research designs and inconsistent empirical measurements.[3] The challenge lies in the collection of data, which often occurs at varying temporal, geographic and social scales. Although climate variability cannot be considered a strong predictor of conflicts,[4] growing research on climate security illustrates plausible pathways between climate dynamics and conflicts, with climate change acting as a risk multiplier.[5]

For instance, when an existing conflict situation is affected by climate change, peacebuilding efforts are inhibited, which tends to extend the conflict and increase the human costs of war.[6] Additionally, climate change can trigger destabilizing impact chains that undermine the extant adaptive capacity of both natural and social systems.[7]

The literature on the rise of armed groups in the Sahel region emphasizes the complex interplay among intercommunal conflicts,[8] the absence of economic opportunities and other material considerations,[9] environmentally induced migrations, grievances, a sense of diminished social status,[10] and the need for protection.[11] In summary, the numerous reports and surveys produced on the connections between climate change, conflicts and recruitment in armed groups offer a well-informed inventory of potential drivers and pathways.[12]

In understanding the multifaceted implications of climate change, this study endeavours to offer insight into the pathways between climate change and recruitment into armed groups. The exploration of this critical intersection between climate change and armed group recruitment is essential not only to further academic scholarship but to develop targeted policies and DDR processes that can address human security concerns and foster resilience in contexts prone to climate-related conflicts.

The following are the key research questions of this study:

1. What are the drivers of vulnerability to join armed groups?
2. What are the links between climate change and recruitment?
3. What are the institutional and social dynamics at stake?
4. What are the resilient drivers to prevent recruitment tendencies?

---

1 Thomas F. Homer-Dixon, "Environmental scarcities and violent conflict: evidence from cases", *International Security*, vol. 19, No. 1 (Summer 1994); Marshall B. Burke and others, "Warming increases the risk of civil war in Africa", PNAS, vol. 106, No. 49 (8 December 2009).
2 Jan Selby and Clemens Hoffmann, "Rethinking climate change, conflict and security", *Geopolitics*, vol. 19, No. 4 (2014).
3 Idean Salehyan, "Climate change and conflict: making sense of disparate findings", *Political Geography*, vol. 43 (November 2014).
4 Halvard Buhaug and others, "One effect to rule them all? A comment on climate and conflict", *Climatic Change*, vol. 127 (2014).
5 Nina Von Uexkul and Halvard Buhaug, "Security implications of climate change: a decade of scientific progress", Journal of Peace Research, vol. 58, No. 1 (2021); Intergovernmental Panel on Climate Change, *Climate Change 2023*: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Geneva: IPCC, 2023).
6 Florian Krampe, "Climate change, peacebuilding and sustaining peace", International Peace Institute Global Observatory, 13 September 2019. Available at: https://theglobalobservatory.org/2019/09/climate-change-peacebuilding-and-sustaining-peace.
7 Jürgen Scheffran, "Climate change and weather extremes as risk multipliers: tipping points, cascading events, and societal instability", in *Climate Change, Security Risks, and Violent Conflicts: Essays from Integrated Climate Research in Hamburg*, Michael Brzoska and Jürgen Scheffran, eds. (Hamburg: Hamburg University Press, 2020).
8 Laurence-Aïda Ammour, "How violent extremist groups exploit intercommunal conflicts in the Sahel", Africa Center for Strategic Studies, 26 February 2020.
9 Anouar Boukhars, "The paradox of modern jihadi insurgencies: the case of the Sahel and Maghreb", Al Jazeera Centre for Studies, 15 July 2018.
10 Pauline Le Roux, "Responding to the rise in violent extremism in the Sahel", Africa Security Brief, No. 36, Africa Center for Strategic Studies, December 2019.
11 Pauline Le Roux, "Exploiting borders in the Sahel: the Islamic State in the Greater Sahara", Africa Center for Strategic Studies, 10 June 2019; and Pauline Le Roux, "Confronting central Mali's extremist threat",Africa Center for Strategic Studies, 22 February 2019.
12 See, for example, Luca Raineri, "If victims become perpetrators: factors contributing to vulnerability and resilience to violent extremism in the central Sahel", International Alert, June 2018.

The focus on pathways helps highlight the fact that climate variability cannot be solely considered an external cause. Rather, climate change amplifies risks inherent in social-ecological systems, particularly in fragile and conflict-affected environments. By considering the pathways as a research tool, the literature makes it possible to connect various dimensions – including human security – with climate change.[13] Embedded within this research framework, the present study endeavours to offer fresh insights into pathways by employing a methodology underpinned by qualitative and quantitative diagnostic evidence and statistical modelling. The focus is on localizing the micropolitics of cascading effects triggered by climate change, particularly its impact on conflicts and recruitment into armed groups.

2. Research location: the context of Tillaberi

Since the early 2010s, a rebellion insurgency has unfolded in Mali that has since extended to neighbouring Niger and Burkina Faso. Beyond the presence of armed groups, the Tillaberi region faces a profound multidimensional crisis marked by a lack of State presence, escalating human insecurity, weaponization dynamics, challenges associated with uncontrolled borders, and widespread population displacements.[14] The Tillaberi region exemplifies a regional security complex, "a group of states whose primary security concerns link together sufficiently closely that their national security cannot realistically be considered apart from one another".[15] Overlaid on this web of challenges is the compounding issue of climate change. The effects of climate change, such as more frequent natural disasters and long-term changes to precipitation and temperature, can combine with other factors to increase the risk, prevalence, duration and/or intensity of violent conflict.

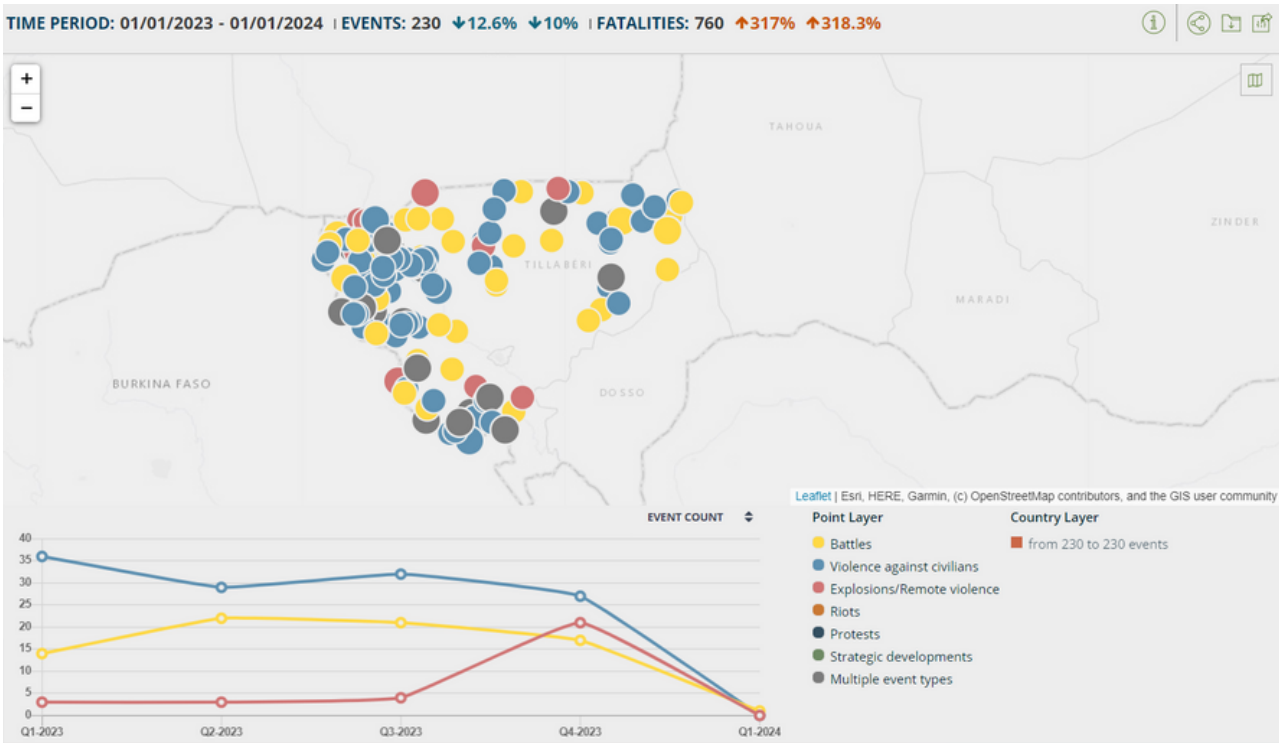

Figure 1: Violent incidents in the Tillaberi region from September 2022 to September 2023 (ACLED Map).

[13] Thomas Homer-Dixon and others, "Synchronous failure: the emerging causal architecture of global crisis", *Ecology and Society*, vol. 20, No. 3 (September 2015).
[14] Wolfram Lacher, "Organized crime and conflict in the Sahel-Sahara region", Carnegie Endowment for International Peace, 13 September 2012.
[15] Barry Buzan, *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era* (Hertfordshire: Harvester Wheatsheaf, 1991), p. 190.

The Tillaberi region is in the “three borders” zone, sharing a common border with both Mali and Burkina Faso. It is significantly affected by various dynamics that destabilize the region. The region bordering Mali and Burkina Faso, situated on the periphery of the Nigerian State, is inhabited by diverse communities, including Tuaregs, Djerma-Sonrai, Hausa, Fulani and Arabs. Despite the presence of borders, these communities share common socioeconomic, cultural and religious practices and engage in similar economic activities like agriculture, livestock, trade, transportation and fishing.[16]

The presence of armed groups in the area is a relatively recent phenomenon, compared with their State-centred presence in Mali and Burkina Faso. Due to these groups’ evolving strategies, in recent years their influence and control of the region has grown. Simultaneously, local populations are facing less access to natural resources and experiencing climatic shocks that push them to migrate to other areas within the country. The identification of the nexus between migration, environment and climate change in the country has been well documented by the International Organization for Migration (IOM).[17] In September 2023, the Ministry of Humanitarian Action and Disaster Management recorded 161,252 flood victims (19,135 households), with 51 deaths. The flooding resulted in the loss of 2,924 livestock, the collapse of 14,294 houses and 2 healthcare centres, and the flooding of 2,207 hectares of crops.[18] The loss of houses and farming assets inevitably leads to the movement of populations seeking more secure lands.

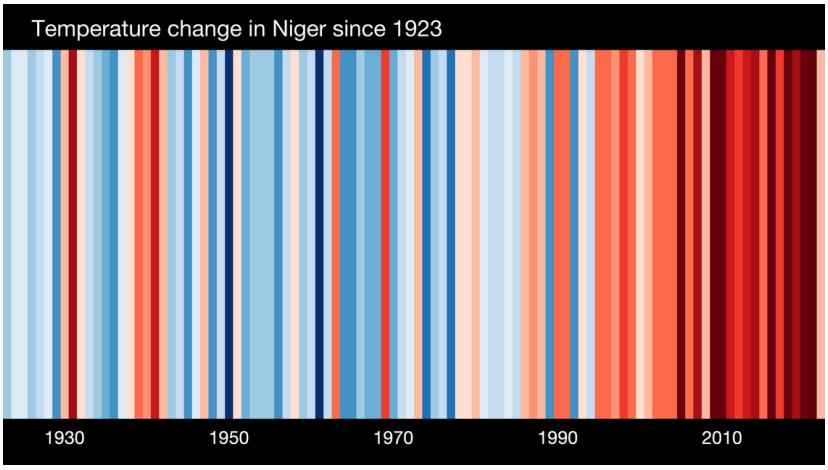

Figure 2: Visual representation of the change in temperature in Niger over the last 100 years.
Source: #ShowYourStripes – Niger, Professor Ed Hawkins (University of Reading)

Farming and herding activities are strongly impacted by changes in rainfall patterns, an increase in sunlight hours and, consequently, evapotranspiration; the depletion of watercourses and various water points; and the reduction of vegetative cover. Human-induced factors intensify these phenomena, including the exploitation of woody species, the expansion of agricultural areas (occupying watercourses, forests and pastoral enclaves), poor agricultural practices and non-compliance with environmental management standards in urbanization processes.

16 Herrick Mouafo Djontu and Karine Gatelier, *Nord-Tillabéri : analyse du conflit lié à l’accès aux ressources naturelles. Le transfrontalier au coeur de l’analyse et de l’action* (Niamey, Niger: Haute Autorité à la Consolidation de la Paix, 2017).
17 Mamadou Dimé and M. Abdoulaye Nakoari Tambandia, *National Study on the Nexus between Migration, Environment and Climate Change* (Geneva: IOM, 2020).
18 UNICEF, “Niger flash update #4”, 29 September 2023.

3. Definitions and Terms

What kind of armed groups are the focus of this study?

There is no agreed definition of non-state armed groups (NSAGs) in international treaties. The Additional Protocol II to the 1949 Geneva Conventions defines non-state armed groups as "dissident armed forces or other organized armed groups, who fight regular armed forces or against each other on the territory of one or several States" (art. 1.1). The International Committee of the Red Cross defines them as "organized armed groups that qualify as a party to a non-international armed conflict".[19] In her Practical Guide to Humanitarian Law, the former legal director of Doctors Without Borders further distinguishes NSAGS from armed forces: "This term refers to a non-state party to an international or non-international armed conflict.
Humanitarian law uses the term of 'armed forces' to designate and define the combatants fighting within a State party to the conflict." [20]

A literature review of research dedicated to those groups in the region, along with the key informant interviews and focus groups conducted during the calibration phase (see Table 1), has assisted us in understanding the types of NSAGs present locally. Most of these groups are related to organized armed groups closely associated with well-established extremist organizations like Jama'at Nasr al-Islam wal Muslimin (JNIM) and the Islamic State in the Greater Sahara (EIGS) and other violent extremist groups present in the Liptako-Gourma region. However, in some localities of the Tillaberi region, local volunteers and community members have created self-defence groups that have taken it upon themselves to protect their villages and communities. Both types of groups qualify as NSAGs, as they employ weapons and are not within the formal military structures of the State.

How do we understand climate change?

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.[21] This definition encompasses a range of natural and human-induced factors. While climate change is a global phenomenon, its impacts vary from region to region but also within a region and/or community.

Therefore, to understand and assess the impact of climate change, it is essential to examine it from a three-dimensional perspective: the exposure of individuals (and/or communities), their vulnerability and the coping strategies employed. The following terms are important to understanding these perspectives:

- **Climatic Hazards**: Weather-related events that can be extreme, consisting of rapid-onset events (e.g. flood or hurricane) and slow-onset events (e.g. loss of biodiversity or change in rainfall patterns).
- **Climate Stressors**: Weather-related or human-induced phenomena that affect the situation of individuals. They are usually slow-onset events, such as salinization and soil degradation.

---

19 International Committee of the Red Cross, "Non-state armed groups". Available at: Herrick Mouafo Djontu and Karine Gatelier, Nord-Tillabéri : analyse du conflit lié à l'accès aux ressources naturelles. Le transfrontalier au coeur de l'analyse et de l'action (Niamey, Niger: Haute Autorité à la Consolidation de la Paix, 2017). (accessed on 20 December 2023).

20 Francoise Bouchet-Saulnier, *The Practical Guide to Humanitarian Law*, 3rd ed. (Lanham, MD: Rowman & Littlefield, 2013). Reproduced on the Doctors without Borders website Practical Guide to Humanitarian Law. Available at: X (accessed on 20 December 2023).

21 IPCC, "Annex I: Glossary", in *Global Warming of 1.5°C*, V. Masson-Delmotte and others, eds. (Cambridge, UK: Cambridge University Press, 2018).

- **Exposure to Climate Change**: Impact of climatic hazards on the socioeconomic situation of individuals (i.e. livelihood or health). It reflects the vulnerability of people to weather events.
- **Climate Change Risk (CCR)**: Combination of climatic hazard and exposure. The level of CCR is measured through two indicators: (1) the extent to which people have experienced different climatic shocks and stressors (climatic hazard) and (2) the extent to which they feel that these climatic events have affected their livelihood and living conditions (exposure to climate change).
- **Natural Resource Management**: Governance mechanisms responsible for regulating the use of natural resources, balancing environmental sustainability, economic well-being and social equity. In the Tillaberi region, natural resource management and the associated dispute resolution mechanisms generally involve the decentralized administrative authorities as well as customary and traditional authorities.
- **Unsustainable Coping Strategies**: Maladaptive individual behaviours towards ecosystems. Some are illegal, while others may not be, but all constitute environmentally harmful practices that prioritize personal and immediate interests in accessing or utilizing natural resources.
- **Human Security**: The United Nations Development Programme's 1994 Human Development Report introduced the concept of human security and identified four essential characteristics: (1) human security is a universal concern, (2) its components are interdependent, (3) it is easier to ensure through prevention, and (4) it is people centred.[22] Human security encompasses economic, food, health, environmental, personal, community, and political security and can also be encapsulated in the "freedom from fear" and "freedom from want" policy axiom.

What is the difference between natural resource mismanagement and unsustainable coping strategies?

The indicator natural resource mismanagement is built along four dimensions: improper ownership practices (such as illegal privatization of a water point), lack of transparency (such as unclear land regulations), lack of governmental guidance (such as a lack of State agents to enforce the regulations) and overuse of the commons (such as collecting too much wood in protected forests). However, it is important to understand the difference between unsustainable coping strategies and natural resource mismanagement.

Unsustainable coping strategies are maladaptive individual behaviours. For example, a person says, "I, as an individual, farm wherever I want." Natural resource mismanagement is reflected in unpunished maladaptive behaviours and a general lack of collective regulations. An individual may say, "I notice that people overuse their ownership rights." To summarize, unsustainable coping strategies inform us about individual behaviours, whereas natural resource mismanagement reflects collective behaviours observed by the respondent.

[22] United Nations Development Programme, *Human Development Report 1994* (New York: Oxford University Press, 1994).

4. Methodology

What is SCORE?

The Social Cohesion and Reconciliation (SCORE) Index was developed through a partnership between the United Nations Development Programme Action for Cooperation and Trust (UNDP-ACT) and the Centre for Sustainable Peace and Democratic Development (SeeD), with funding from the United States Agency for International Development (USAID). Our evidence-based peacebuilding methodology combines an extensive participatory research process with advanced data analysis to identify the drivers of conflict dynamics and peaceful social change. It draws inspiration from multiple scientific disciplines, including sociology, psychology, international relations and security studies, and is flexible enough to incorporate new research findings, global policy guidelines and the realities of each local and regional context.

Research Protocol

The project adopted a mixed methodological approach that combines qualitative and quantitative surveys. The qualitative data were collected through key informant interviews and focus groups conducted by Omega KbK in the Tillaberi region from February to March 2023. The quantitative data are drawn from a household survey of 1,213 respondents in the 13 departments of the Tillaberi region from April to May 2023.

Stakeholders	Number of interviews
Key Informant Interviews	28
Institutional (HACP, CNEDD, etc.)	7
Civil society organizations	4
Local authorities	8
Religious leaders	3
Former combatants	3
Self-defence group members	3
Focus groups	12
Youth organizations	6
Women's Organisations	6

Table 1: Stakeholders interviewed during the calibration phase.

Sample distribution

As a sampling approach for the quantitative phase, a random walk methodology was used to select households in covered areas. Then a kish grid was used to randomly sample respondents within households. The distribution of the sample results in representativeness at the regional level.

Description of the analyses

The SCORE questionnaire was built around more than 70 questions (each of them containing between 3 and 10 items). Indicators were created by aggregating items. Statistical techniques (such as Cronbach's alpha or factor analysis) were carried out to ensure the reliability and validity of the models. For instance, to create the food security indicator, the analysis combined responses to questions about quantity of food per day, quality of food and ability to feed all the members of the household.

Quantitative and statistical analysis was carried out according to the objectives and analysis plan of the project. To examine the level of association between two indicators, Pearson correlation coefficients were calculated. All correlations mentioned in this report are statistically significant at a p-value of 0.05 or below. The higher the value of the correlation, the stronger the association between two variables. The association between two variables can be either positive or negative but does not suggest any kind of causal relationship. For instance, even though "access to services" and "vulnerability to join" are (negatively) correlated, we cannot assert that an increase in access to services statistically predicts a decrease in vulnerability to join. Instead, we observe that they are related and vary in opposite directions.

To assess whether group means are different at a statistically significant level, analysis of variance (ANOVA) tests were conducted. All group comparisons reported have an F-value over 20 or a Cohen's d effect size above medium and are statistically significant at a p-value of 0.05 or below. This analysis highlights which variables display significant difference for specific level of disaggregation. For example, in this study, the ANOVA showed significant difference between women and men for the variable "exposure to climate change" – men being more exposed than women.

In predictive analyses, multilevel linear regressions were used. Further, to demonstrate the magnitude and direction (i.e. effect) of each predictor variable on the outcome variable in predictive models, standardized beta coefficients are reported. Standardized beta coefficients denote the degree of change in the outcome variable for every 1-unit (standard deviation) of change in the predictor, while controlling for the influence of all other predictors in the model. For example, the variables "willingness to hold weapons" and "revenge tendency" are drivers of the outcome "vulnerability to join armed groups" with beta coefficients of 0.16 each. The R-squared (explanatory power of the outcome) is at 0.53, meaning that 53 per cent of the variance of the vulnerability to join can be explained by the variance of those two drivers.

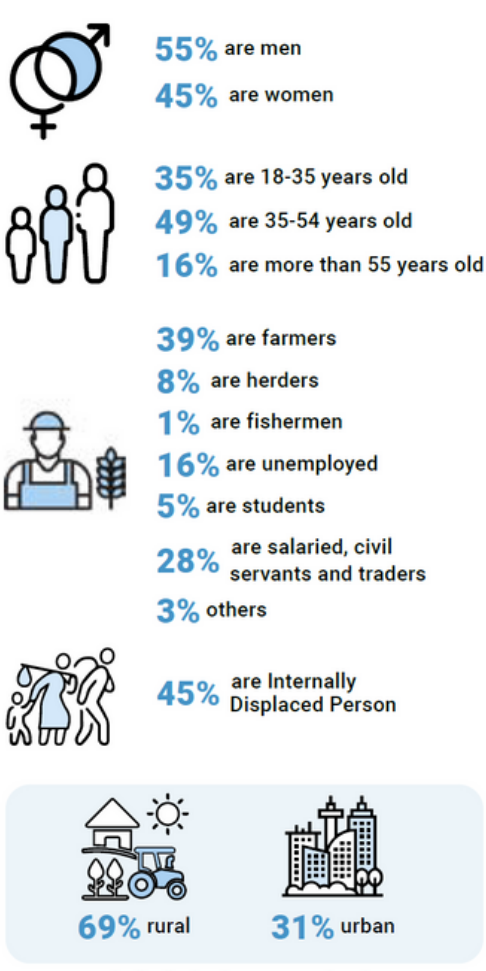

Figure 3: Sample distribution (1,200 respondents)

Mediation analysis was also performed to statically confirm the significance level of linkages between the variables and the outcomes of the model. This analysis is utilized to investigate the effect of one or more independent variables on a dependent variable via a third variable (mediator) or intervening variable. Total direct and indirect effects were analysed. The mentioned indirect effects were statistically significant according to the bootstrap lower-limit confidence interval and upper-limit confidence interval;

Resilience analysis can identify the characteristics of individuals that display, for example an unexpected positive adaptation in the face of adversities. Resilience analysis has been used in developmental psychology[23] and conflict studies[24] and is an analytical strategy that allows researchers to test questions related to adversities and resilience/fragility factors. To test adversities, multilevel linear regression modelling is used to examine the effects of various adversities on an outcome. This provides insight into which adversities impact the outcome of interest, and the strength with which they do so. According to the nature of the outcome (positive or negative), values (positive/negative) of residuals are assigned to individual cases in the sample that perform better on the outcome than predicted by the fitted line, after accounting for all adversities.

Why a predictive analysis?

The utilization of model predictive analysis helps to identify distinct pathways. As previously discussed, a robust consensus regarding the interplay between climate change, conflicts and patterns of armed group recruitment is notably lacking. This is likely attributed to the sophisticated and context-dependent nature of these interactions, compounded by the involvement of complex retroactions and feedback loops. In this context, predictive analysis delineates the multifaceted relationships and illuminates clear pathways.
The identification of pathways serves as a valuable instrument for informing policymaking, enabling a more nuanced understanding of complex relationships and facilitating navigation of the political landscape.[25] Each pathway, derived from the predictive modelling, can present an entry point for a DDR process to address the specific pathway into an armed group.[26]

5. Limitations and Justification of the Vulnerability to Join Outcome

Explanation of the outcome

The objective of the analysis is to uncover the connections between the impacts of climate change and vulnerability towards armed group recruitment (VtJ). The SCORE methodology is based on a household survey, which involves interviewing a representative sample of a population in a given locality. Consequently, the data collected do not directly capture recruitment experiences. Given limitations to sampling combatants or former combatants, the questionnaire's design aimed to capture tendencies that could potentially lead to recruitment among a random sample of Tillaberi residents.

Several techniques were employed to mitigate social desirability biases, as most respondents were unlikely to openly admit that they desire to join an armed group. For instance, rather than directly asking individuals if they were willing to join an armed group, one of the questions was formulated to discern whether they would personally consider it acceptable to join an armed group for a series of reasons. Each of these reasons was personalized to position the respondent as the direct protagonist. In this context, the respondent was answering, "I would find it acceptable (for me) to join an armed group to protect my family/my cattle/my community etc." Responses to such questions help to reveal to what extent an individual considers themselves distant from being recruited – based on the number of reasons that would justify their joining an armed group to satisfy a personal need. In other words, the person indirectly conveys that joining an armed group is something they can condone, envision or consider as a possibility.

---

[23] Ann S. Masten, "Pathways to integrated resilience science", Psychological Inquiry, vol. 26, No. 2 (2015); Ann S. Masten, "Global perspectives on resilience in children and youth", *Child Development*, vol. 85, No. 1 (January/February 2014).
[24] Alexandros Lordos and Daniel Hyslop, "The assessment of multisystemic resilience in conflict-affected populations", in *Multisystemic Resilience: Adaptation and Transformation in Contexts of Change*, Michael Ungar, ed. (New York: Oxford Academic, 2021); Alexandros Lordos and others, "Societal healing in Rwanda: toward a multisystemic framework for mental health, social cohesion, and sustainable livelihoods among survivors and perpetrators of the genocide against the Tutsi", *Health and Human Rights Journal*, vol. 23, No. 1 (June 2021).
[25] Malin Mobjörk, Florian Krampe and Kheira Tarif, "Pathways of climate insecurity: guidance for policymakers", SIPRI Policy Brief, November 2020.
[26] Resilience analyses are applied at various stages along the pathways to develop strategies aimed at disrupting the cascading effects within those pathways (see section 4).

The measurement of the outcome is, therefore, a pre-recruitment indicator. It involves understanding the multidimensional factors that make individuals susceptible to recruitment and informs us about individuals at risk. This indicator collects several data points that signal a potential recruitment tendency. In essence, it gauges the vulnerability of individuals to recruitment by armed groups by identifying the characteristics of individuals who are more likely to be attracted to and inclined towards recruitment. The development of various analyses based on this outcome is intended to offer insights that can be used to prevent recruitment.

Conceptual construction of the VtJ outcome

The vulnerability to join non-state armed groups is based on four dimensions: the tendency to cooperate with these groups, the tendency to bring them support, the legitimization of their governing capacities and the propensity of individuals to join them. By combining these four dimensions,[27] the indicator measures individuals' propensity to join NSAGs and calculates scores over 10 for different locations and demographic groups. In this instance, given the sensitive and risky phenomena the outcome indicator is measuring, we consider scores above 1 high enough to interpret. Figure 4 shows how this outcome indicator is built.

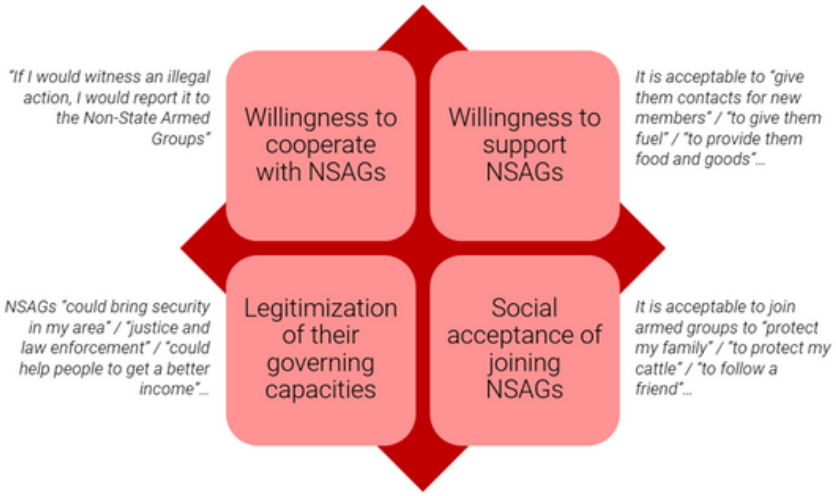

Figure 4: Components of the indicator "vulnerability to join".

What does the outcome tell us?

In examining where NSAGs find potential candidates, the study focused on identifying local configurations that facilitate recruitment. The emphasis was on understanding both community and individual characteristics that contribute to the growth of NSAGs. This involved gauging an individual's tendency to accept them and view them as legitimate governing bodies, and assessing the extent to which individuals consider the possibility of joining them for personal reasons. The higher the scores on these indicators, the fewer obstacles NSAGs face locally in terms of disapproval and hindrance to their growth. When no one opposes their presence, it becomes easier for NSAGs to expand and recruit. The analysis aims to uncover the "pool" of potential candidates and identify local conditions and dynamics that fuel the growth of these groups. The overarching goal of this research is to develop DDR processes that target individuals who are vulnerable to recruitment and receptive to NSAGs' narratives. Insights from the study offer strategies to inhibit NSAGs' ability to infiltrate communities, replace the State and create conditions that attract individuals to join.

A rational choice based on opportunities?

We are addressing the situation of individuals who might personally decide to join an armed group. The results presented in this context do not account for the dynamics of individuals being forcibly enrolled;

[27] Cronbach's alpha: 0.609; Cronbach's alpha based on standardized items: 0.668.

such research would necessitate a different methodological protocol. The respondents (for the quantitative part of the research) did not belong to NSAGs, and the collected data inform us about their potential inclination to join a group in the future, not accounting for the possibility of forced recruitment.[28] Therefore, the results presented here assume that vulnerability to join is a matter of individual choice under specific conditions. Individuals weigh various opportunities and base their decisions on the problems they face and the available mitigation capabilities, excluding the consideration of potential forced recruitment.[29] The decision to join local armed groups is often strategic, driven by the pursuit of perceived critical competitive advantages or material promises[30] rather than by commitment to beliefs – such as religion, for example.[31]

Two explanations stand out for why people choose to join armed groups. Often, individuals are driven by socioeconomic opportunities, seeking a means to improve their circumstances. Security reasons also play a significant role, with individuals drawn to armed groups as a perceived source of protection and stability.[32]

Social acceptability of NSAGs

In the extensive literature on armed groups in the Liptako-Gourma region, a notable theme emerges, shedding light on the local strategies employed by these groups to garner social acceptance and, consequently, recruit new members. NSAGs strategically expand their influence through social integration within local communities.

Sometimes functioning as self-defence entities, NSAGs often position themselves as protectors of communities that extend support to them. This symbiotic relationship not only fortifies the armed groups but also creates an environment where individuals from these communities are more inclined to consider joining, viewing doing so as a means of contributing to the safeguarding of their people. The social legitimization of those groups further strengthens their appeal, as local communities may perceive them as more effective or responsive than State institutions.

When individuals legitimize these groups as providers of essential services, they inadvertently contribute to their expansion. Furthermore, by acknowledging the effectiveness of these groups in service delivery, individuals indirectly affirm that these armed entities outperform the State. This perspective reinforces the hypothesis that recruitment fuels and is fuelled by critical stances against the State,[33] a sense of neglect by the State, a lack of trust in security forces,[34] and not having confidence in the State's capacity to provide essential services.[35]

> I have parents in Mali, and often we would take the animals there for transhumance. It's a practice that dates back to the time of our parents. But in recent years, our animals are being stolen, and sometimes even the young shepherds are killed, and the entire herd is taken away. There have been several cases. One of my cousins from Mali told me that we should help our Fulani parents against the attacks we are facing and the frequent theft of animals. He said that it is up to us, the young ones, to defend our wealth because if we do nothing, we will end up without any animals. So, we joined his group, and I was integrated.[36]

Thus, we assert that an individual exhibits susceptibility to recruitment when they endorse the actions of armed groups, express a willingness to collaborate with them, demonstrate readiness to provide assistance and support, and would potentially join them for individual reasons. The aggregation of these four facets helps to measure an individual's inclination to join a NSAG and therefore informs us about their "vulnerability to join".

---

28 Even though some children are forcibly recruited into conflicts, most of the research in the region shows that individuals are deliberately joining those groups, attracted by various incentives. Save the Children, "Children in Mali, Niger, Burkina Faso face greater risk of recruitment by armed groups", 20 October 2021.
29 Rafael Reuveny, "Climate change-induced migration and violent conflict", *Political Geography*, vol. 26, No. 6 (August 2007).
30 Boukhars, "The paradox of modern jihadi insurgencies".
31 Raineri, "If victims become perpetrators".
32 Mathieu Pellerin, "Les trajectoires de radicalisation religieuse au Sahel", Notes de l'IFRI, 2017.
33 USAID, "Mixed method study: gender differentiated drivers of violent extremism in central Sahel", Sahel CVE Research, 15 November 2021.
34 Ozonnia Ojielo and others, *Journey to Extremism in Africa: Drivers, Incentives, and the Tipping Point for Recruitment* (New York: UNDP, 2017).
35 Harriet Allan and others, *Drivers of Violent Extremism: Hypotheses and Literature Review* (London: Royal United Services Institute, 2015).
36 Interview with a former combatant from Bankilare.

6. Results of the Predictive Analysis

Figure 5 illustrates the results of the predictive analysis. As previously mentioned, predictive analysis reveals the magnitude and direction (i.e. effect) of each predictor variable on the outcome variable. This study analyses the factors that render individuals more susceptible to recruitment in NSAGs. Therefore, vulnerability to join (VtJ) NSAGs serves as the study's outcome (highlighted in red). The arrows represent the direction of the relationship between two phenomena, with associated numbers indicating the strength of the effect. A higher number signifies a stronger influence from the driver to the outcome.

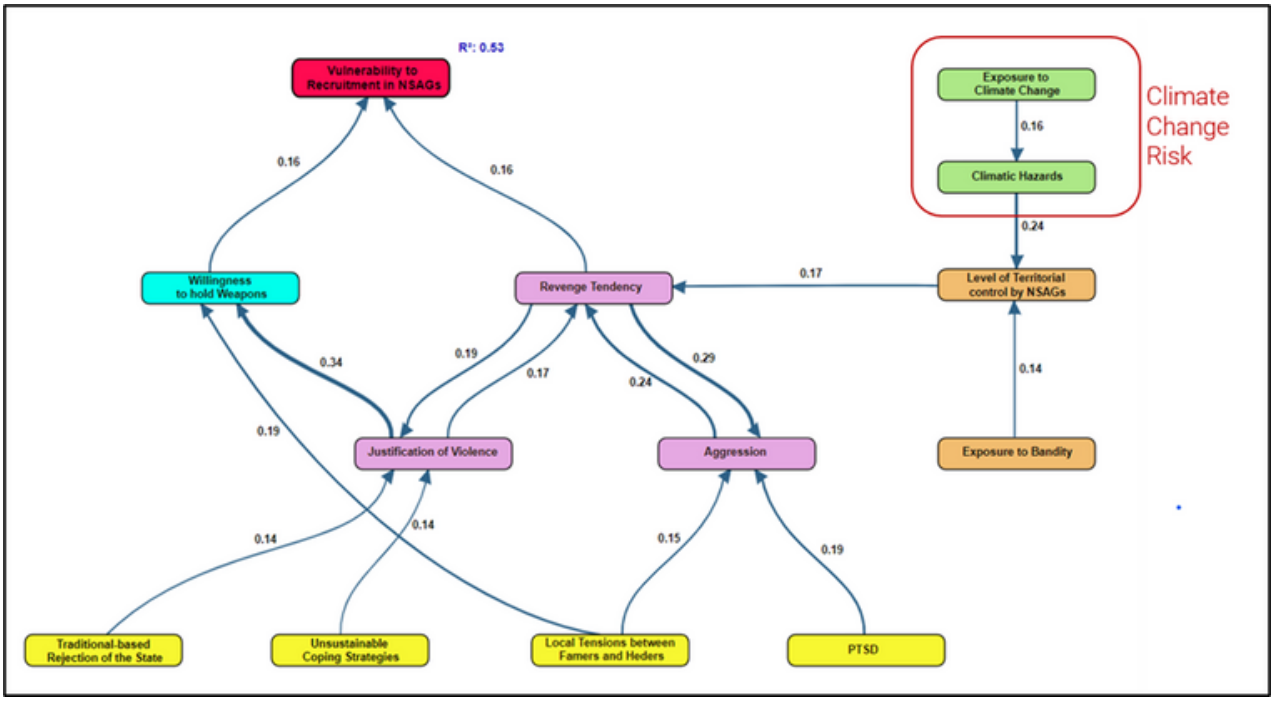

Figure 5: Model for vulnerability to join NSAGs resulting from the predictive analysis.

As Figure 5 shows, vulnerability to join is directly influenced by two drivers, willingness to hold weapons and revenge tendency.[37] As explained earlier, the R-squared (explanatory power of the outcome) is at 0.53, meaning that 53 per cent of the variance of the vulnerability to join can be explained by the variance of these predictors. While these two phenomena are the exclusive direct contributors to VtJ, they are influenced by other drivers. For example, willingness to hold weapons is directly driven by justification of violence and local tensions between farmers and herders.

In summary, by tracking the direction of the arrows leading directly or indirectly to VtJ, Figure 5 maps the cascading effects and identifies specific pathways from various entry points. For instance, one interpretation may commence with unsustainable coping strategies, leading to justification of violence, then to revenge tendency, culminating in vulnerability to join. Therefore, the model shows that the adoption of unsustainable coping strategies, through successive steps, renders people more vulnerable to recruitment in NSAGs (see Pathway 3 in section 2).

The following section elucidates the pathways identified in the model that establish connections between environmental dynamics and VtJ. Section 2 of this report interprets the pathways that originate in a climate-related phenomenon:

- Pathway 1. Climate change risk
- Pathway 2. Tensions between farmers and herders
- Pathway 3. Unsustainable coping strategies
- Pathway 4. The role of natural resource mismanagement

[37] See the glossary in Annex B.

SECTION 1. CLIMATE CHANGE AND ENVIRONMENTAL CONFLICTS IN TILLABERI

This section is an overview of the study's examination of climatic conditions in the Tillaberi region and investigates the relationship between the established indicators related to climate.

1. Climate Change and Natural Resource Situations

The SCORE questionnaire was designed to gain insight into the climate situations in the Tillaberi region from the perspective of its inhabitants. In essence, the data collected through the questionnaire represent their firsthand experiences of climate change, offering a glimpse into the subjective perceptions of individuals in the region. Several survey questions and indicators were developed to lay bare the types of climate shocks, the types of natural resources disputed, and the range of socioeconomic impacts associated with climate change.

The basic risk assessment formula Risk = Hazard × Exposure is often used to quantify the potential impact of a hazard in a given situation. The hazard represents the likelihood of an incident occurring, and exposure refers to the impact that incident would have on an individual.

The questionnaire built two crucial indicators to measure both the perceived frequency and intensity of climatic hazards as well as the exposure to these events as perceived by the respondents.[38] The first set of metrics included various climatic shocks and stressors, listing different types of hazards and degradations that are associated with climate change. The respondents were asked about the frequency with which these events occur in the region. This first set gave us the hazard indicator. The second set of metrics focused on the potential impact of these hazards and degradations on daily life and the livelihoods of the population. This latter metric shed light on the community's vulnerability to various weather events, thereby giving us the exposure to climate change indicator. The combination of both, as depicted in the model, provides information about the climate change risk experienced by the Tillaberi population.[39]

---

38 Susan Clayton and others, "Psychological research and global climate change", *Nature Climate Change*, vol. 5 (July 2015).

39 The aim here is not provide a complex climate change risk assessment, but strictly to identify the hazards experienced and the associated socioeconomic impacts. Indeed, a risk assessment approach implies taking into consideration the responses and options available to address those challenges. See, for instance, W. Neil Adger, Iain Brown and Swenja Surminski, "Advances in risk assessment for climate change adaptation policy", *Philosophical Transactions of the Royal Society A*, vol. 376 (13 June 2018).

A. Climatic Hazards

The methodology employed in this survey does not enable us to discern whether the frequency of a weather event is a result of climate change, nor does it directly attribute the scarcity of a specific type of natural resource to climate change dynamics. However, through the calibration phase, we were able to identify the primary weather hazards and environmental degradations experienced in the Tillaberi region. These collectively form a catalogue of local climatic stressors and shocks. To clarify, while the climatic hazards indicators focus on weather events, the exposure to climate change indicators highlight the repercussions of those weather events on livelihoods and households, according to the respondents. Figure 6 illustrates the frequency of climatic hazards and the severity of the different types of environmental degradations perceived by the respondents.

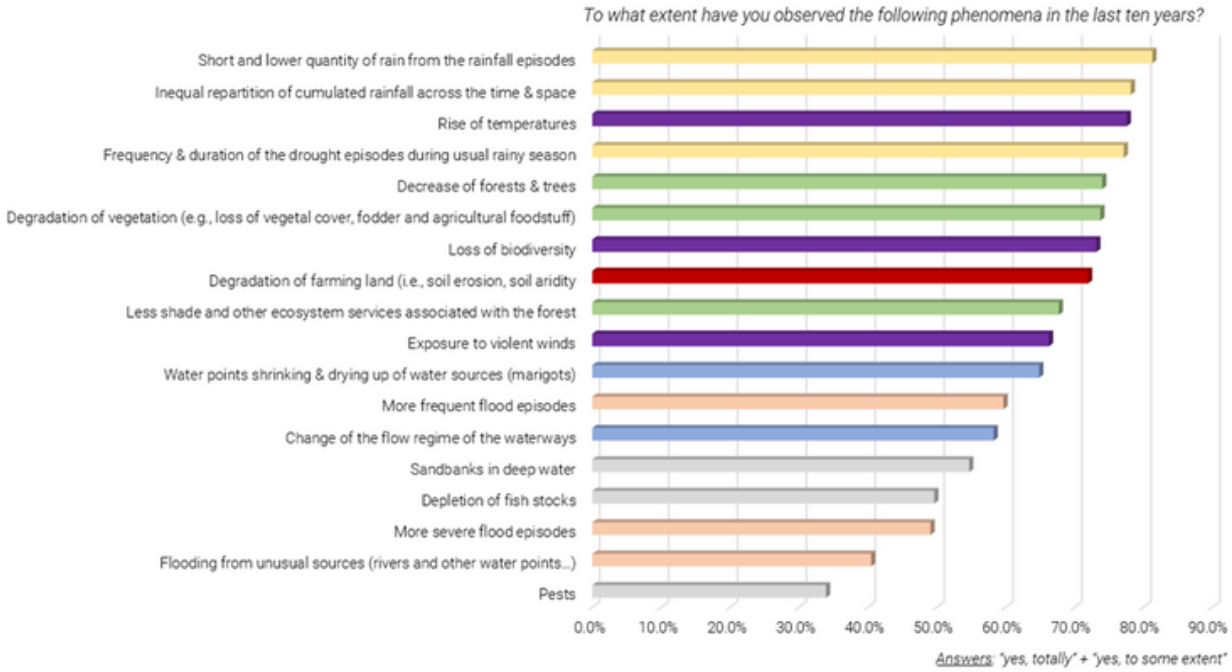

Figure 6: Frequency of the climatic hazards in the Tillaberi region, according to respondents, divided into eight indicators categories: drought hazards (yellow), degradation of climatic conditions (purple), water resource degradation (blue), flood hazards (orange), vegetation degradation (green), other hazards (grey) and land degradation (red).

The elements were combined to create a set of coherent indicators illustrating different types of hazards. For instance, the yellow bars in Figure 6 represent occurrences associated with drought hazards, whereas the green bars signify degradation of vegetation. This approach enables the analysis to pinpoint the predominant hazard types in the region and identify the departments that are primarily impacted by each specific hazard type. The three most prevalent types of shocks and stressors in the region are degradation of climatic conditions (purple), drought-related phenomena (yellow) and vegetation degradation (green).

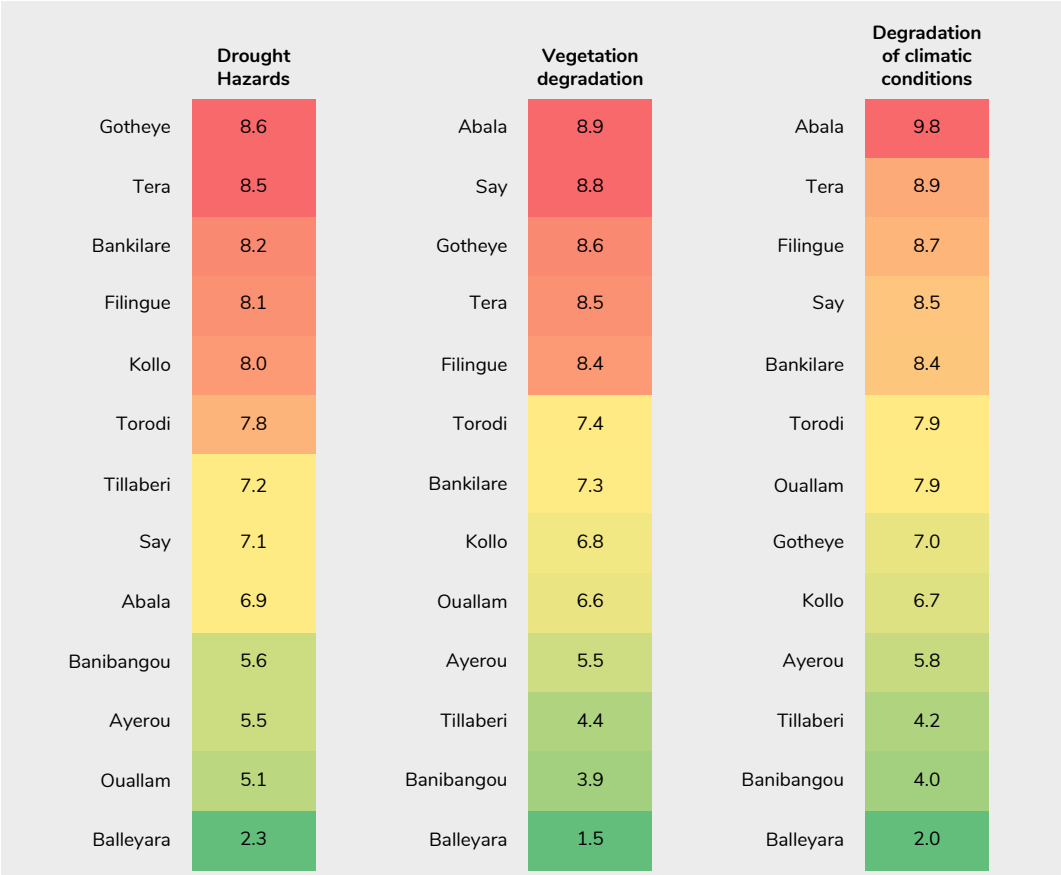

Figure 7: Barometers – climatic shocks and stressors (scores per department).

The climatic hazards indicator is a composite of all types of hazards listed in Figure 6. The highest scores were identified in Tera, Say and Bankilare, indicating that a significant number of respondents in those departments reported observing most climatic hazards over the last 10 years. In simpler terms, it is in Tera, Say and Bankilare that populations believe they are facing an intensification of the different climate change–related shocks and stressors.

B. Exposure to Climate Change

To understand the CCR, the questionnaire also sought to capture the socioeconomic impacts of climate change on daily life. To that end, a list of effects and consequences of climate change that the population could potentially experience was developed based on the qualitative findings and consultations of the calibration phase. The exposure to socioeconomic impacts of climate change yields information about the vulnerability of people and households to weather hazards and environmental degradations. It illustrates how climate change impacts the livelihoods of households.[40]

[40] Throughout the interviews, enumerators took care to ensure that respondents perceived the items listed in Figure 8 as consequences of the hazards in Figure 6. For instance, when a respondent mentioned a consistent decline in their production each year, the enumerator verified that the respondent attributed this decrease to climate change. A respondent who observed a production decline due to deteriorating infrastructure or selling a portion of land was not regarded as providing a positive response to the first item.

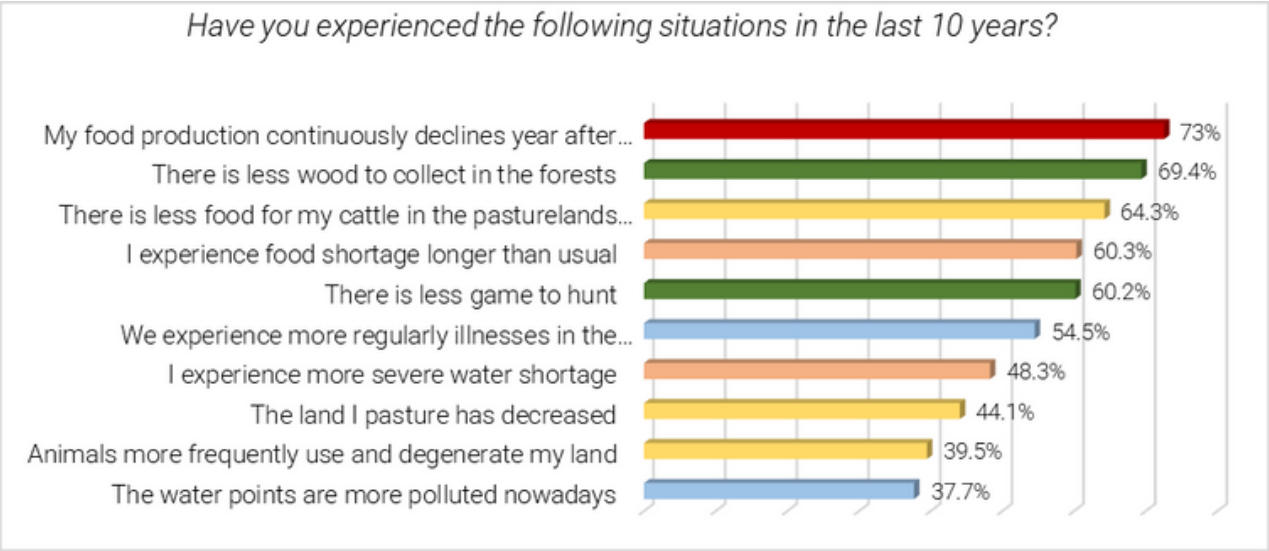

Figure 8: Frequency of socioeconomic impacts due to climatic hazards, according to respondents, divided into five categories of indicators: reduction of farming production (red), water and food shortages (orange), degradation of conditions for cattle farming (yellow), exposure to pollution and illnesses (blue), and reduction of forest services (green).

The results show that the consequences of climate change vary across departments. For example, some departments report a strong impact on conditions for cattle farming, whereas others report mainly an impact on water and food shortages. Say and Tera are the most exposed to those different consequences.

It should be noted that forest resources appear to be the natural resource most affected. When we compare the five indicators mentioned above, the highest score is the one of reduction of forest services, meaning that from all the different types of perceived consequences associated with climate change, the degradation of forest services impacts the most households, surpassing water scarcity or degradation of pasturelands, for instance.

As Colonel Major Yacouba Seybou, Directeur Général des Eaux et Forets, observed in an interview:

> The proximity to the capital is a disadvantage, because the capital has needs, especially for energy and services, which deteriorates wooded areas... . Climate change affects all resources. However, it is often perceived more through forest resources that die due to lack of rain, violent winds or floods.

C. Climate Change Risk: Relationship between Hazard and Exposure

Correlations among the types of climatic hazards

The correlations among climatic hazards can provide valuable insights. For instance, vegetation degradation and climatic conditions degradation are strongly correlated (0.8). This implies that an increase in vegetation degradation is likely to be accompanied by an increase in climatic conditions degradation. Moreover, vegetation degradation exhibits a strong correlation with land degradation (0.72). In simpler terms, the responses from the participants suggest a high likelihood of observing simultaneous climatic hazards contributing to the degradation of the land (such as soil erosion and aridity), vegetation (such as reduced wood, fodder and vegetal cover, and less shade) and climatic conditions (such as violent winds and a rise in temperature).

Correlations among the types of exposure to climate change

Similarly, several exposure indicators are strongly correlated. Firstly, exposure to pollution and illnesses, and exposure to water and food shortages, show a significant correlation (0.55). This suggests that when there is an increase in water and food shortages due to climate change, illnesses and pollution are also likely to increase. As climate change leads to more frequent droughts and reduced water availability, communities may experience heightened water and food shortages. In such circumstances, the likelihood of increased illnesses, such as waterborne diseases due to inadequate sanitation, and heightened pollution from the intensified use of alternative resources becomes more pronounced, demonstrating the interconnected impact of these environmental challenges.

Notably, the strongest correlation observed is between degradation of cattle conditions and degradation of farming production (0.81). This strong association indicates that farming and herding conditions are interdependent, and that the deterioration of one is highly likely to coincide with the degradation of the other. In cases where farming production is compromised due to extreme weather events, such as droughts or floods, the subsequent scarcity of feed and resources can directly impact the health and productivity of cattle, underscoring the interconnected challenges faced by both agricultural and herding practices.

Correlations between Climatic Hazards and Exposure to Climate Change

Exposure to Climate Change Climatic Hazards	Drought	Shrinking Water points	Flood	Land Degradation	Vegetation Degradation	Climatic Conditions Degradation	Other Climatic Hazards
Exposure to Reduced Crop Yield	0.11		0.08	0.12	0.11	0.07	0.07
Exposure to Water and Food Shortages	0.28	0.30	0.13	0.24	0.26	0.19	0.30
Exposure to Degradation of Conditions for Cattle Farming	0.09	0.07	0.08	0.08	0.10	0.08	0.08
Exposure to Pollution and Illnesses	0.21	0.31	0.15	0.12	0.12		0.46
Exposure to Reduction of Forest Services	0.19	0.14	0.14	0.38	0.55	0.60	0.21

Table 2: Correlations between climatic hazards and exposure to climate change. (Blank entries signify no correlation found).

Table 2 illustrates the correlations between hazards and exposure repercussions. Three types of climate change consequences are correlated with climatic hazards: exposure to water and food shortages, exposure to pollution and illnesses, and exposure to reduction of forest services. Food and water shortages are significantly correlated with most of the climatic hazards, meaning that the increase of those weather events is likely to coincide with an increase in food and water shortages.

As mentioned earlier, the most frequently observed consequence of climate change in the region is the reduction of forest services, significantly affecting many households. Notably, this indicator demonstrates the strongest correlations. Respondents attribute the degradation of forest services as the climate change consequence most closely connected to climatic hazards. The decline in vegetal cover and/or fodder (vegetation degradation), adverse climatic conditions (such as stronger winds and temperature increases), and land degradation (including soil erosion and aridity) are primarily associated with their collective impact on forest services.

2. Materialization of the Climate Security Nexus in Tillaberi

The remaining sections of this report describe the pathways that connect climate change dynamics with vulnerability to join NSAGs. The predictive model (Figure 5) suggests that exposure to climate change is not a direct cause of recruitment (in the sense that there is not a direct arrow connecting climate change risk and vulnerability to join). Rather, CCR aggravates conditions that increase the vulnerability of individuals to recruitment.[41] For instance, the predictive model shows that CCR leads to a stronger presence of NSAGs, which reinforces revenge tendencies and eventually influences the VtJ (see Pathway 1). However, other phenomena from the predictive model are related to climate change patterns. Indeed, tensions between farmers and herders or unsustainable coping strategies are strongly related to CCR. Figure 9 highlights the existence of a coherent set of indicators strongly correlated with CCR.

These correlations should be kept in mind when it comes to interpreting the pathways presented in section 2. It is important to understand these pathways within a nexus. Each specific social phenomenon from the model (such as tensions between farmers and herders), psychological disposition (such as aggression) or socioeconomic situation (such as exposure to climate change) is related to a complex network of phenomena. For instance, talking about tensions between farmers and herders as an entry point for VtJ should be considered alongside natural resource mismanagement. Figure 9 illustrates the existence of a climate security nexus at the local level in the Tillaberi region, reflecting the associations between climate-related dynamics and security matters found in this study.

[41] See, for instance, Krampe, "Climate change, peacebuilding and sustaining peace"; Jeremiah O. Asaka, "Climate change–terrorism nexus? a preliminary review/analysis of the literature", *Perspectives on Terrorism*, vol. 15, No. 1 (February 2021); Tim Sweijs, Marleen de Haan and Hugo van Manen, *Unpacking the Climate Security Nexus: Seven Pathologies Linking Climate Change to Violent Conflict* (The Hague, Netherlands: The Hague Centre for Strategic Studies, 2022); Rebecca Froese and Janpeter Schilling, "The nexus of climate change, land use, and conflicts", Current Climate Change Reports, vol. 5 (2019).

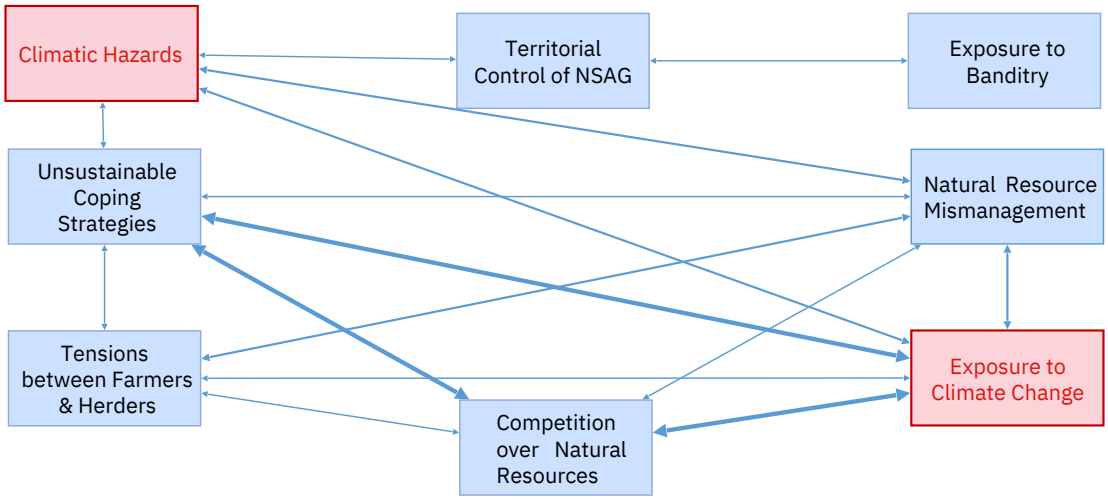

Figure 9: Correlations between indicators illustrating a climate security nexus in the Tillaberi region. The thickness of the arrow reflects the strength of the correlation between two indicators.

Conflicts over resources have frequently been recognized as a result of a combination of diverse factors, including severe climatic stressors, situations involving resource scarcity, mismanagement of natural resources and inadequate justice mechanisms.[42] The data gathered for this study highlight the strength of correlation between these various phenomena, revealing the existence of a nexus. As mentioned earlier, the results of the study did not pinpoint climate change as a direct cause of recruitment into armed groups; however, climate change does act as an aggravating factor that impacts individuals' vulnerability to join armed groups. Therefore, climate change is not a distant spectre but an active agent in pathways to vulnerability.

[42] Homer-Dixon, "Environmental scarcities and violent conflict".

SECTION 2. LINKAGES BETWEEN CLIMATE CHANGE AND VULNERABILITY TO ARMED GROUP RECRUITMENT: EXPLORING THE PATHWAYS

VINCENT VAN ZEIJST

PATHWAY 1. FROM CLIMATE CHANGE RISK TO VULNERABILITY TO JOIN

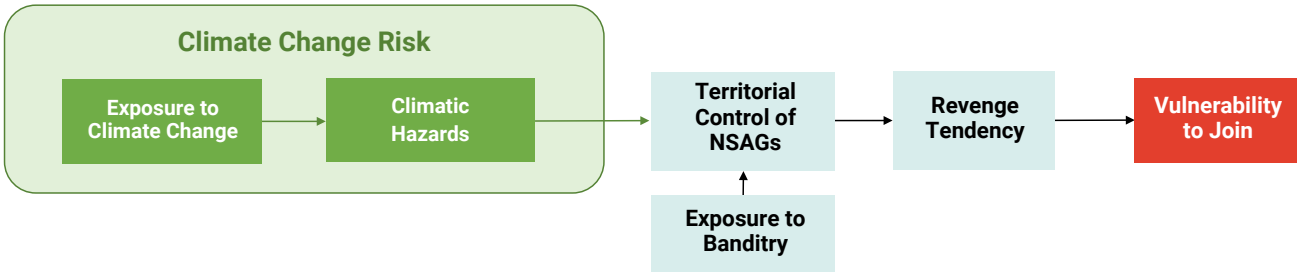

Figure 10: Pathway 1: pathway from the entry point "Climate Change Risk".

Finding 1: The consequences of climate change, exposure to banditry and the presence of NSAGs are intertwined and reinforce each other. Moreover, they indirectly contribute to VtJ by intensifying violent reactions at the individual level. They create a sense of being besieged by structural forces, making people more prone to violence and, therefore, more vulnerable to joining armed groups. In that sense, the impacts of climate change can be considered aggravating factors driving VtJ.

Finding 2: The level of territorial control by NSAGs in the areas studied, ranging from sporadic presence to administrative control, increases with the severity of climate shocks experienced by the populations. The perceived territorial control of NSAGs is related to the climate change experiences of the individuals surveyed.

A. The Role of Climate Change Risk

The first effect generated by climate change risk is territorial control of NSAGs. The presence of CCR appears to be one of the factors strengthening NSAGs' influence in a given area. To be more precise, the perceived level of territorial control exerted by NSAGs escalates in tandem with the intensity of CCR. The occurrence of weather-related shocks and stressors, coupled with the socioeconomic repercussions of these events on the livelihoods of the local population, leads to the presence of NSAGs.

The concept of vulnerability is crucial to understanding the link between NSAG presence and climate change dynamics. This introduces two key factors into the analysis: the level of human security and the role of the State as the provider of essential services that enable populations to effectively manage challenges.

B. From Climate Change Risk to Territorial Presence of NSAGs

The level of presence of NSAGs indicator was created to differentiate the types of presence of armed groups across various departments. The strategies and mobility patterns of NSAGs are closely linked to the local context. Their presence is volatile and varies according to local climate configurations.[43] The analysis aimed to distinguish among three levels of presence, ranging from sporadic presence to full administrative control of the area. Therefore, a high score illustrates a situation where NSAGs are established and are providing governance services, whereas a low score describes local configurations where NSAGs exhibit mobility. The variation of the score reflects the degree of presence of non-state armed groups.

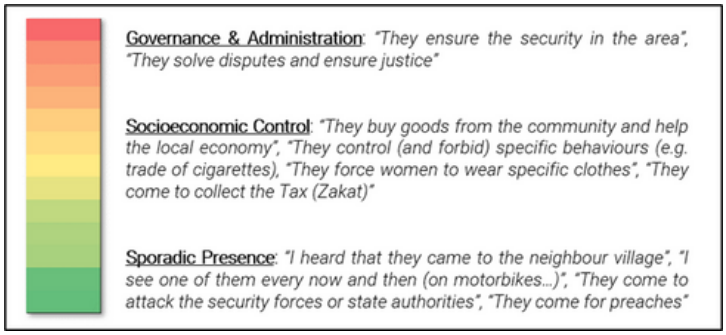

Figure 11: Levels of Territorial Presence of NSAGs.

Decrease of State presence as NSAGs' territorial control increases

Climate change can be an opportunity for NSAGs to position themselves as alternative service and relief providers in places where Governments are weak or unresponsive, especially in the face of climatic consequences.[44] As climate change leads to more frequent and severe weather events, communities are faced with heightened vulnerabilities and urgent needs at the same time that the Governments' resources and capacities are increasingly strained or merely insufficient to address the challenges.

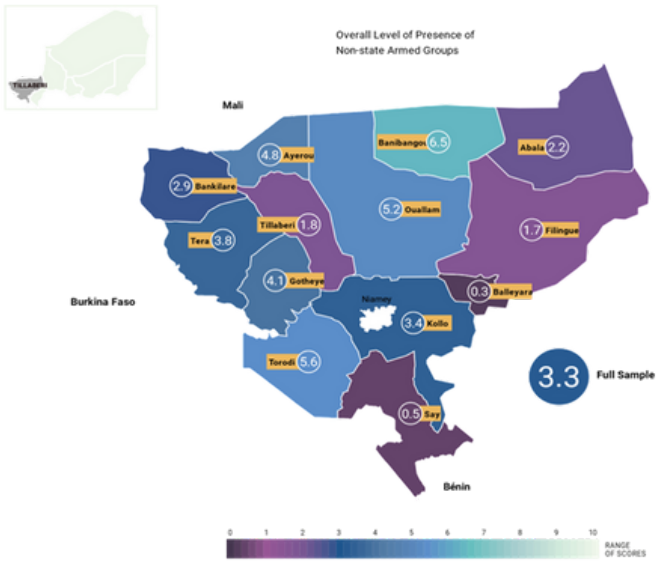

Figure 12: Level of presence of NSAGs in Tillaberi.

The low level of NSAG presence in the Say department may appear surprising, given that movements of these groups have been identified in the W forest area. However, NSAGs in Say are constantly on the move and regularly retreat into the forested areas; people are aware of their presence but do not coexist with them to the same extent as in departments along the Mali border. Moreover, the provision of police and justice services in Say is notably higher than the average (with a score of 8.3), indicating a much stronger presence of security forces compared to the departments bordering Mali (scoring 0.1 in Banibangou, 3.9 in Ayerou, and 4.0 in Bankilare). In this context, NSAGs in Say are prevented from establishing a strong presence in the villages and are limited to engaging in sporadic actions. This local situation emphasizes once again that the territorial presence of NSAGs is inextricably linked to the ability of the State to ensure basic services, such as physical security.

The situation in Tillaberi has also been impacted by recent political upheaval in Niger. Since the coup d'état in July 2023, NSAG attacks in the region have been recorded in previously unaffected areas. The departure of international forces, along with the recall of certain national military forces to Niamey to "protect" the junta in power, which until recently feared military intervention by the Economic Community of West African States (ECOWAS), has helped to create space for NSAGs to operate.

---

43 Joshua M. Regan and Sean K. Young, "Climate change in the Horn of Africa: causations for violent extremism", Behavioral Sciences of Terrorism and Political Aggression, 4 May 2022.
44 Colin Walch, "Weakened by the storm: rebel group recruitment in the wake of natural disasters in the Philippines", *Journal of Peace Research*, vol. 55, No. 3 (2018).

The importance of the level of acceptance of NSAGs by local populations

It is crucial to understand that an increase in the score of NSAGs' territorial control indicates a decrease in State presence.[45] Banibangou, Torodi, Ouallam and Ayerou are the departments of the Tillaberi region where the presence levels of NSAGs are greatest. They range from a high level of socioeconomic control (level 2) to a high level of administrative presence (level 3). Among these four departments, two of them (Banibangou and Ayerou) show a high level of NSAG acceptance (meaning that there is a tendency for citizens to legitimize the actions of the armed groups and to regard them as governing bodies). In Banibangou, for example, two respondents out of five believe that the armed groups could bring security to the area, and 19 per cent believe that these groups could help improve people's incomes and livelihoods.

The populations in Ayerou and Banibangou departments perceive the State's absence through a lack of access to basic public services. This is particularly pronounced in Banibangou, where 97 per cent of respondents report having no access to electricity, 95 per cent lack access to clean water, and 95 per cent state that protection and security are not provided at all by the police, gendarmerie or armed forces. NSAGs tend to position themselves as service providers in places where the State is absent. Consequently, they are perceived as less "harmful". The high level of vulnerability in these areas leaves people in a state of despair, inclining them to accept assistance from any source.

Another contextual explanation for the legitimization of NSAGs in these two departments is that the recruitment strategies of the armed groups in the region are distinct. Both Ayerou and Banibangou are located on the border with Mali, where the armed groups are primarily associated with the Islamic State in the Greater Sahara (ISGS), whereas departments along the Burkina border are populated by groups related to Jama'at Nasr al-Islam wal Muslimin (JNIM). ISGS combatants are predominantly autochthonous, coming from the Menaka region. Combatants from the armed groups and the populations of Ayerou and Banibangou often share the same communities. Many NSAG combatants located along the Mali border are locals (fils du terroir). In contrast, the combatants integrated into JNIM groups along the Burkina Faso border consist of individuals from Northern Mali, Arabs and even Algerians. Consequently, they are more likely to be perceived as strangers, leading to a lower level of acceptance in Torodi, Tera and Gotheye. The geographical and community proximity of the groups along the Mali border helps explain the level of legitimization of NSAGs in these departments.

The model highlights that exposure to climate risks tends to facilitate the presence of armed groups. However, other explanatory factors should be kept in mind, as NSAGs adjust their interventions and level of control based on dynamics such as the presence of the State, national or international armed forces, etc.

C. Other Aggravating Factors: Banditry and Insecurity Dynamics

The literature demonstrates the linkages between armed groups' presence and illicit activities, particularly related to cross-border dynamics. Other research shows that climatic shocks and banditry can be connected under specific circumstances. This model indicates that exposure to banditry leads to the territorial presence of NSAGs, confirming that illicit economic activities and armed groups are intertwined. However, it is important to note that the causal relationships illustrated in the model do not prove that the presence of banditry serves as a definitive indicator of armed group presence or that banditry activities are exclusive to armed groups. Nevertheless, the results prompt us to consider that banditry activities create a context conducive to the development of NSAGs.

[45] Ayesha Siddiqi, "Climatic disasters and radical politics in southern Pakistan: the non-linear connection", *Geopolitics*, vol. 19, No. 4 (August 2014).

> For example, in the Balleyara area, trafficking is very common. And you know, a young person who decides to make this their activity, you can no longer control them. They generate a lot of money through the sale of fuel, pharmaceutical products and even drugs. All of these activities can dazzle the eyes of young people and facilitate contacts with extremist groups.[46]

Indeed, various armed groups use illicit activities and local conflicts to advance their goals. These groups adapt their activities to exploit local vulnerabilities, economic rivalries and governance gaps. Illicit ventures, such as trafficking in weapons, drugs and fuel, along with activities like cattle rustling and artisanal gold mining, are essential for armed groups' survival and expansion. Income generated from these activities supports their procurement of necessities like food, medicine, weapons and communication equipment. These groups also employ nuanced strategies in local conflicts, influenced by factors like community infiltration and power dynamics. Hence, the growth of armed groups is inherently linked to the proliferation of banditry and illicit activities.

A high level of legitimization of armed groups and a high level of past recruitment have been identified in the department of Balleyara, which might seem surprising, as there is no presence of armed groups in this area. The tendency to legitimize these groups and/or to join them can be explained by the prevalence of banditry and other illegal activities in the department.

D. Structural Fragilization of Human Security

The dynamics described above provide insights into the connections between the presence of NSAGs and climate change risk. Beyond this relationship, the nexus that emerges in Figure 5 should be examined through an integrated approach that can uncover the links between these external structural stressors. An integrated approach is recommended, since analysing only a section of this nexus, such as the exclusive relationship between climate change and NSAGs' presence, might lead to erroneous interpretations. One way to integrate the different phenomena discussed in this section is to consider the human security dimension.

First, climate change risk illustrates how climatic hazards impact livelihoods, revealing the vulnerability of populations. It invites us to consider that the impact of climate change on economic and food security plays a role in the pathway. Second, the exposure to NSAGs as well as to banditry activities illustrates a reduction of physical security. The interplay of various dimensions of human security — economic, food, health, community and political — demonstrates the complex connections at stake in the face of climate change and armed groups' presence.

Climate change risk, NSAGs' territorial control and the presence of banditry form a complex web of structural threats, collectively undermining human security in the region. The two barometers in Figure 13 show that the levels of both physical and economic security are notably low in departments most vulnerable to these threats. This conjunction, coupled with inadequate State presence, places populations in a state of neglect, fostering inclinations towards revenge and diminishing their capacity for peaceful coping.

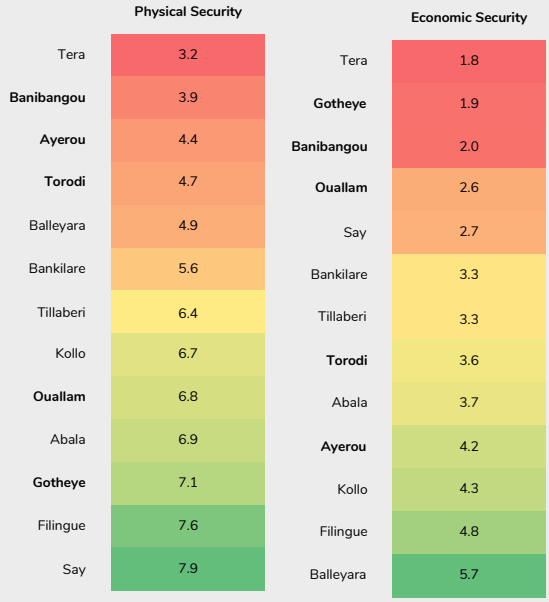

Figure 13: Barometers for physical and economic security. The five departments that reported the highest level of presence of the NSAGs are in bold.

[46] Respondent in focus group with youth association in Tillaberi department.

PATHWAY 2. FROM TENSIONS BETWEEN HERDERS AND FARMERS TO VULNERABILITY TO JOIN

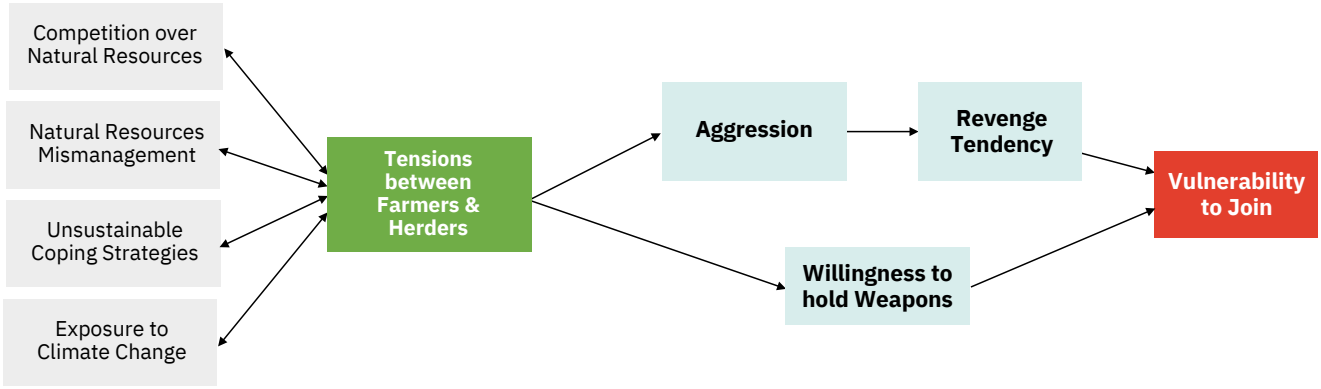

Figure 14: Pathway 2: pathway from the entry point "Tensions betwen Farmers & Herders". The boxes in grey indicate the correlations with "tensions between farmers and herders", whereas the other arrows indicate the causal relationships identified through the predictive analysis.

Finding 3: Tensions between herders and farmers serve as an entry point for two distinct pathways. On one hand, these tensions contribute to individual violent tendencies, and on the other, they foster inclinations towards weaponization. The willingness to possess weapons occurs in areas where regulations and local mechanisms may be lacking or ineffective. In these contentious situations, individuals rationalize the use of weapons as a means of defence or asserting their rights.

A. Tensions between Farmers and Herders in the Tillaberi Region

As mentioned earlier, the simultaneous practice of agriculture and livestock farming is common in the Sahel region.[47] In the survey dataset, among the farming population, four out of five respondents belonged to the agropastoral category, combining crops and cattle as a source of income. For 79 per cent of them, farming was the primary activity, while 17 per cent focused on cattle (and 3 per cent were fishermen). The diversification of activities blurs the boundaries between these groups. In addition, the agricultural landscape in the Tillaberi region doesn't rigidly divide farmers on one side and herders on the other. Moreover, transhumance persists in the area. All these elements explain the disputes between farmers and herders.

Table 3 lists the questionnaire items used to measure the phenomenon and displays the four departments that recorded the highest levels of tensions between farmers and herders. By combining these items, the indicator helps to illuminate how the rivalry between the two groups is perceived and how it generates stress at the individual level.

47 A.M. Bonficlioli, "Pastoralisme, agro-pastoralisme et retour : itinéraires sahéliens", *Cahiers des Sciences Humaines*, vol. 26, No 1–2 (1990).

	Banibangou	Bankilare	Say	Tera
We have historical grievances between us	49%	51%	79%	58%
It is hard to live peacefully with them because the likelihood of conflict is high when we meet them	62%	86%	82%	70%
It is hard to reconcile our respective interests	49%	73%	86%	67%
Their presence involves less access to natural resources for me (e.g. less water or land)	62%	84%	78%	72%
Their presence affects my livelihood and my well-being	68%	76%	71%	64%

Table 3: Tensions between farmers and herders (frequencies).

B. Which Context Escalates Tensions?

To grasp the roots of these tensions, it is crucial to examine the local context of resource competition against a backdrop of scarcity and resource degradation.[48] This occurs within a framework of poor governance and a lack of acceptance of regulatory mechanisms. Ultimately, the objective is to place the issue of tensions between farmers and pastoralists within the broader local climatic configuration, aiding our comprehension of the conditions that might impact recruitment decisions.

Competition over natural resources and vulnerability to climate change play a key role…

The survey highlighted how tensions between farmers and herders were correlated with competition over natural resources, exposure to climate change and, particularly, with natural resource mismanagement. The results confirm a well-established trend in climate security literature of tensions escalating in a scenario of competition over natural resources and climate change, especially when people are highly vulnerable and lack reliable regulatory mechanisms and efficient governance modalities.[49] The survey responses suggest that in Say, Tera, Bankilare and Banibangou, people experience the highest levels of competition over natural resources, the most significant climate change impacts on livelihood, and the highest tensions between farmers and herders.

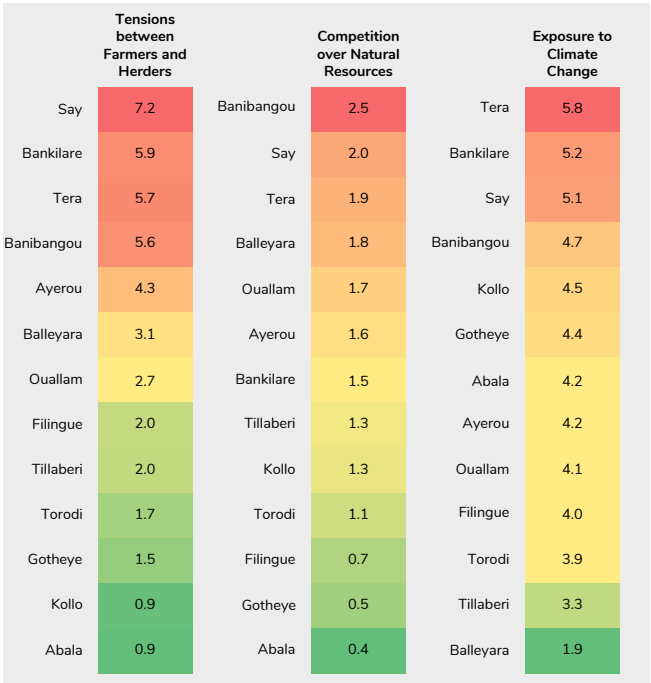

Figure 15: Barometer scores for tensions between herders and farmers, competition over natural resources, and exposure to climate change.

When natural resource management is ineffective.

For several reasons, natural resource management is crucial for mitigating tensions between farmers and herders. First and foremost, both groups heavily depend on shared resources such as land and water for their livelihoods. Effective management ensures equitable access and sustainable use of these resources, reducing conflicts arising from competition. Additionally, exposure to climate change leads to increased stress on shared resources, requiring additional management.

Historically, regional public policies related to pastoralism have been criticized and seen as disadvantageous to herders.[50] This unequal treatment of pastoral and agricultural activities has been a source of grievances (see Pathway 4 for more details). A sense of structural marginalization among

[48] Sunday Didam Audu, "Conflicts among farmers and pastoralists in northern Nigeria induced by freshwater scarcity", *Developing Country Studies*, vol. 3, No. 12 (2013).
[49] Cedric de Coning and Florian Krampe, *Multilateral Cooperation in the Area of Climate-Related Security and Development Risks in Africa* (Oslo: Norwegian Institute of National Affairs, 2020).
[50] Inter-Réseaux, "Le pastoralisme a-t-il encore un avenir en Afrique de l'Ouest ?", *Grain de sel*, No. 73–74 (July 2016–June 2017).

herders facilitates their tendency to reject the State and what it represents. The combination of this feeling of marginalization and a radical critique of the State gives the narratives of armed groups in the region more traction in herders' communities.[51] The herders that were surveyed observed a higher level of natural resource mismanagement and exhibited higher levels of rejection of the State and vulnerability to join. However, despite these variations in mean scores, the ANOVA analysis suggests there are no significant differences between farmers and herders in regard to those phenomena.

In other words, there might not be a strong consensus among herders' and farmers' communities about the deficits in natural resource management, but the latter plays a pivotal role in the tensions between these two groups and contributes to the conflictual landscape of the region (see Pathway 4)

C. Under What Conditions Do Herders-Farmers Tensions Drive VtJ?

Historical, ecological, demographic and farming dynamics increase competition over natural resources.[52] Armed contests over natural resources should be viewed through a lens of "spatial logic" that focuses on relevant environmental attributes such as the location of wells, pastures and communal resources.[53] From this perspective, the case of Say is illustrative because it frames how "weaponization" dynamics, combined with historical grievances between farmers and herders, facilitate the escalation of violence.[54]

Historically, Say has been a territory of migration. Following episodes of famine in 1984, authorities relocated populations from Ouallam to Say, which had a low population density. The arrival of allochthonous populations has increased since then, driven by the availability of forest resources. Additionally, herders in this area, primarily Fulanis, do not practice transhumance but maintain cattle, necessitating vegetation and fodder. Finally, local agriculture continues to expand, requiring more space. The combination of these dynamics results in high competition for natural resources, particularly land, in the department. Thus, disputes between farmers and herders are not a recent development in Say. What is new is the proliferation of weapons and that these tensions, under certain conditions, can lead to VtJ.[55]

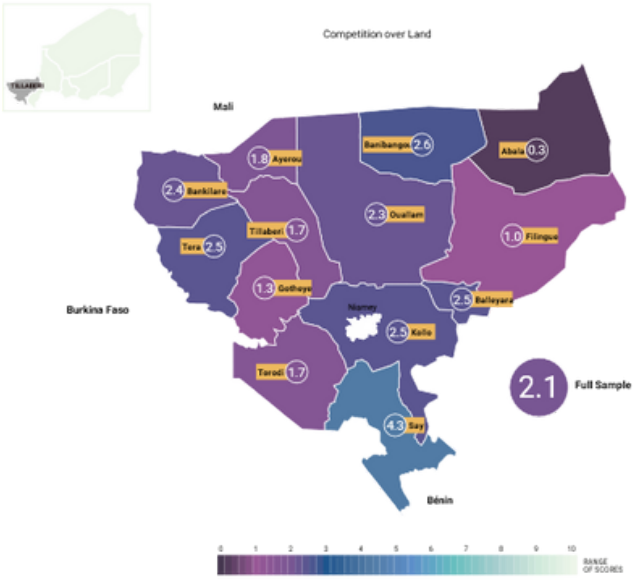

Figure 16: Heatmap "Competition over Land"

This report discerns several cascading effects of tensions between farmers and herders in a context of climate change:

- Competition over land resources fuels tensions between farmers and herders.
- These tensions create an environment where individuals become more aggressive and, at the same time, feel justified to acquire weapons.
- All of this is occurring in an area where regulations and local mechanisms are often lacking or ineffective. (The score related to the existence of local preventive mechanisms of conflicts is the lowest in Say.)
- Individuals rationalize the use of weapons as a means of defence or asserting their rights.
- The willingness to own a weapon increases the owner's vulnerability to join an armed group.

Disputes between farmers and herders, weaponization dynamics and recruitment into armed groups can be connected to unsustainable coping strategies (see Pathway 3). Indeed, the occupation of transhumance corridors and the privatization of water, among other issues, contribute to escalating tensions and violent behaviours among herder communities. Further, these actions make individuals more susceptible to the narratives of armed groups.

---

51 Tor A. Benjaminsen and Boubacar Ba, "Why do pastoralists in Mali join jihadist groups? A political ecological explanation", *The Journal of Peasant Studies*, vol. 46, No. 1 (2019).
52 Emeka E. Obioha, "Climate change, population drift and violent conflict over land resources in northeastern Nigeria", *Journal of Human Ecology*, vol. 23, No. 4 (2008).
53 Adrien Detges, "Close-up on renewable resources and armed conflict: the spatial logic of pastoralist violence in Northern Kenya", *Political Geography*, vol. 42 (September 2014).
54 Andrew McGregor, "The Fulani crisis: communal violence and radicalization in the Sahel," *CTC Sentinel*, vol. 10, No. 2 (February 2017).
55 Thomas E. Griffin, "Lake Chad: changing hydrography, violent extremism, and climate-conflict intersection", *Expeditions with MCUP*, vol. 2020 (2020).

PATHWAY 3. FROM UNSUSTAINABLE COPING STRATEGIES TO VULNERABILITY TO JOIN

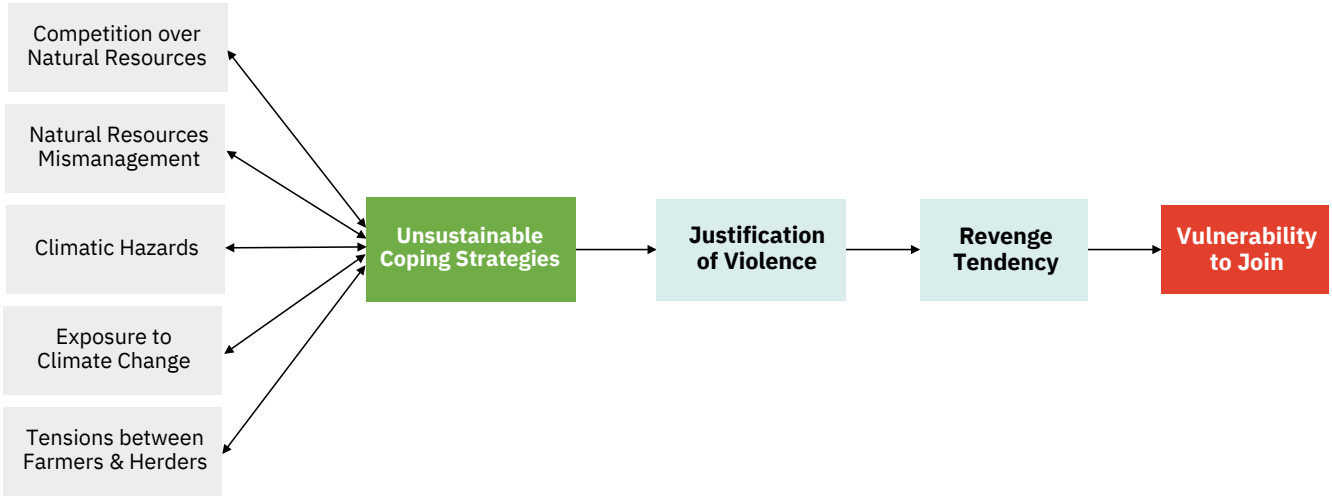

Figure 17: Pathway 3: pathway from the entry point "Unsustainable Coping Strategy".

Finding 4: The adoption of unsustainable coping strategies, such as farming in wetlands, gathering fodder and crop remnants, or well drilling without authorization, is significantly correlated with vulnerability to climate change and the intensity of resource competition. These unsustainable practices, in turn, contribute to the emergence of violent tendencies and can influence VtJ.

A. What Is an Unsustainable Coping Strategy?

The qualitative phase, along with the literature review, assisted us in pinpointing a set of practices being implemented in the Tillaberi region. Some are illegal while others may not be, but all constitute harmful behaviours towards ecosystems. Together, they form a list of self-serving practices that prioritize personal and immediate interests in accessing or utilizing natural resources. Table 4 provides a detailed description of unsustainable behaviours in the five districts with the highest scores.

It is essential to remember that these are experiences lived by individuals. The adopted methodology does not allow us to ascertain whether a reduction in available wood or a decline in game are due to climatic degradation or human practices. The high level of correlation between unsustainable coping strategies and exposure to climate change highlights that destructive environmental behaviours and the consequences of climate change on individuals' daily lives are interconnected.

B. Which Context Stimulates the Adoption of Unsustainable Coping Strategies?

As Table 2 illustrates, there is a link between the climate security nexus and the development of unsustainable practices. This connection is particularly evident in situations marked by intense competition for resources and exposure to climate change.

To what extent is it acceptable to do the following...?	Ayerou	Banibangou	Bankilare	Say	Torodi
Farming lands located in the wetlands (belonging to the public domain)	50.0%	50.0%	69.2%	37.3%	95.7%
Expanding my farming land even though it does not belong to me	16.7%	44.4%	46.2%	31.4%	56.5%
Collecting fodder, crop leftovers, wood ... in areas belonging to others and/or without authorization	50.0%	50.0%	84.6%	56.9%	56.5%
Drilling a well without asking for authorization from authorities	50.0%	22.2%	92.3%	62.7%	65.2%
Overfarming without allowing fallow time	33.3%	16.7%	76.9%	58.8%	60.9%
Turning to illicit activities	25.0%	11.1%	0.0%	0.0%	26.1%

Table 4: Types of unsustainable coping strategies (frequencies).

Firstly, there is a clear link between the emergence of unsustainable agricultural practices and individual exposure to climate change. Those affected by climate shocks are more likely to adopt harmful farming methods. For instance, unauthorized land occupations in Tillaberi are more common when individuals perceive threats to their livelihoods from climate change, indicating that economic shocks from climate events can lead to maladaptive coping strategies.

Secondly, when people perceive competition for natural resources, especially land, they can adopt self-interested and unsustainable behaviours. Even in areas that are perceived as having abundant resources, such as Say, people can develop a mindset of exploitation rather than conservation, where short-term gains are prioritized over long-term consequences.

Studies do suggest that people often cooperate to establish rules for resource sharing, even when doing so may not align with their individual interests.[56] Improving natural resource governance mechanisms can reduce the adoption of unsustainable strategies, allowing communities to adapt and strengthen their social fabric (see Pathway 4).

C. Why Does This Combination of Factors Lead to Violent Behaviours?

The combined effects of resource competition, individual vulnerability to climate impacts, and the adoption of unsustainable practices serve as catalysts for the development of violent tendencies. The situation of herders in another region of the country illustrates this pathway.[57]

The gradual encroachment on grazing lands by fields, combined with overgrazing, has led to a decline in floristic diversity and the depletion of pastures. Additionally, the settlement of herder families has triggered a response from farmers, who have begun occupying areas bordering transhumance routes and zones near water points for off-season cultivation. These dynamics create a feedback loop where unsustainable strategies exacerbate resource competition, fostering harmful behaviours in regions experiencing a deficit of State presence and natural resource mechanisms.

In this scenario, the limited access to water points and the restricted space for farming and cattle grazing act as stressors. These pressures prompt individuals to rationalize the use of violence, eventually compelling them to wield weapons to defend their access to natural resources.

[56] Elinor Ostrom, "Governing the commons: the evolution of institutions for collective action", *Natural Resources Journal*, vol. 32, No. 415 (1992).
[57] Food and Agricultural Organization of the United Nations, "The Niger: analysis of conflicts over transhumance in Diffa region", 2021.

PATHWAY 4. THE ROLE OF NATURAL RESOURCE MISMANAGEMENT

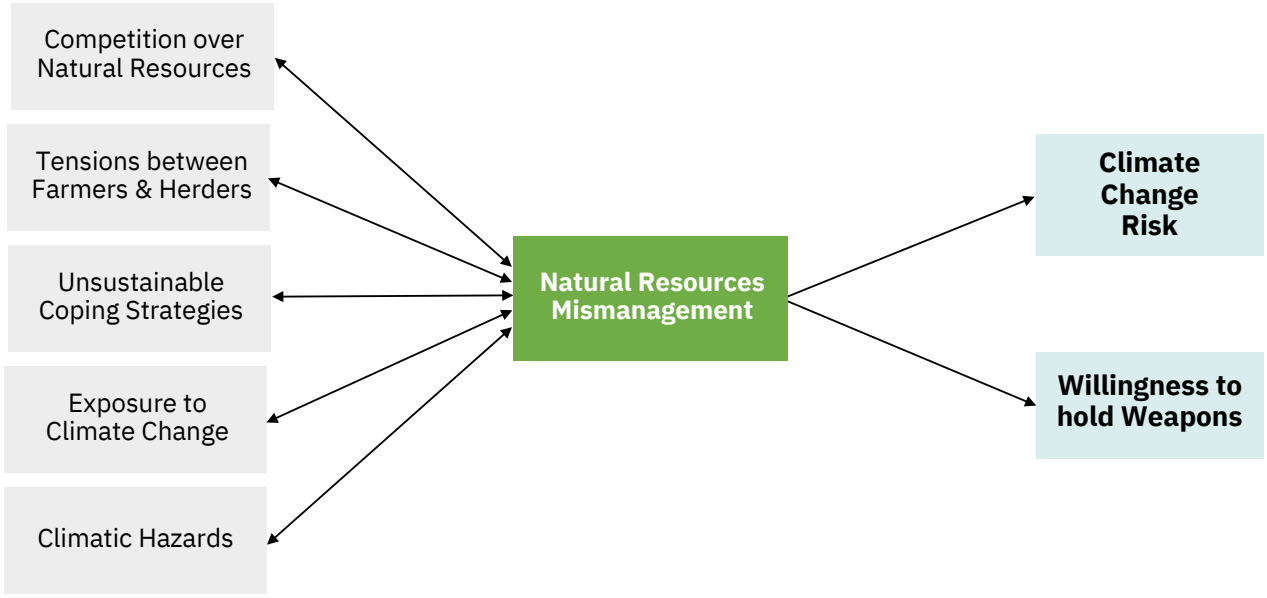

Figure 18: Pathway 4: pathway from the entry point "Natural Resources Mismanagement".

Finding 4: Deficits in natural resource management play a pivotal role, amplifying exposure to climatic hazards. Poor natural resource mechanisms instil in individuals a heightened sense of experience with climatic shocks and stressors.

Finding 5: Natural resource mismanagement predicts higher levels of weaponization. When individuals perceive a lack of regulation or encounter deficits in the distribution of resources, they become more inclined to justify the ownership of weapons.

Finding 7: Natural resource mismanagement is correlated with various indicators reflecting deficiencies within the social fabric, which suggests that natural resource governance and strong intragroup and intergroup bonds within communities are interdependent.

Natural resource mismanagement has been identified as a driver for two key indicators in the predictive analysis: climatic hazards and willingness to hold weapons.[58] In simpler terms, inadequate governance of natural resources (from the administrative as well as the customary authorities) predicts a higher sense of exposure to climate change risk and a tendency to justify the use of weapons.

[58] To clarify why natural resource mismanagement does not appear in the model even though it is a predictor of two variables, it is essential to understand how the model is built. As explained in the introduction, the predictive analysis that produces the model relies on multilinear regressions and mediation analysis. In simpler terms, the indicators included in the model underwent a two-step analysis. First, multilinear regressions were conducted to identify the indicators that pave the pathway (i.e. A leading to B, and B leading to C). In the second step, mediation analysis helped verify the significance of the interlink: confirming if B acts as a mediator between A and C (i.e. A leading to B and B leading to C does not necessarily imply that A leads to C via B). In the context of these two-fold analyses, natural resource mismanagement successfully "passed" the first multilinear step: being identified as a driver of two indicators of the model. However, the second step revealed that it does not act as a mediator. In other words, we can infer that natural resource mismanagement influences two phenomena, but we cannot assert that it contributes to the pathway leading to the outcome. The present section is therefore dedicated to understanding how natural resource mismanagement predicts higher levels of exposure to climatic hazards and higher levels of weaponization (without confirming that it is part of the pathway leading to vulnerability to join).

A. What Does Natural Resource Mismanagement Imply?

The deficits related to natural resource governance are often mentioned in the literature as a key driver of conflicts. Several questions were asked about the management of those resources in the Tillaberi region:

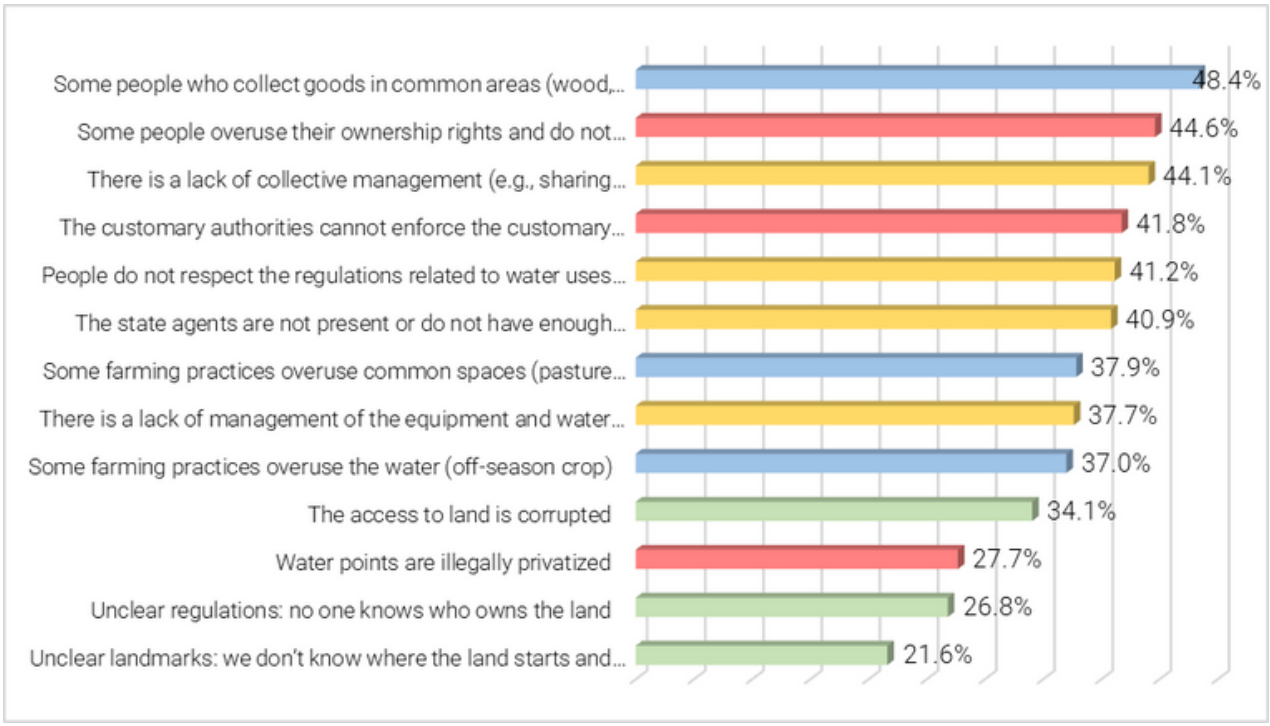

Figure 19: Items used to measure the efficiency of natural resource management (frequencies), divided into four indicators categories: questionable privatization practices (red), lack of transparency (green), lack of governmental guidance (yellow) and the overuse of the commons (blue).[59]

	Abala	Ayerou	Balleyara	Banibangou	Bankilare	Filingue
Questionable Privatization Practices	6.1	5	5	4	5.6	2.2
Lack of Transparency	4.3	4.3	2	4	5.1	1.3
Lack of Governmental Guidance	6.5	4.2	2.8	4.7	6.1	3.4
Overuse of the Commons	5.4	4.1	3	4.1	6.2	2.8
Natural Resource Mismanagement	5.6	4.4	2.8	4.2	5.8	2.5

	Gotheye	Kollo	Ouallam	Say	Tera	Tillaberi	Torodi
Questionable Privatization Practices	2	3.4	3.8	5.1	6.3	2.5	4
Lack of Transparency	1.1	2.7	3.2	2	6.5	2.4	3.5
Lack of Governmental Guidance	2.5	2.9	4.2	5.9	6.7	2.9	4.2
Overuse of the Commons	3	3.4	4.3	7.1	7.9	2.4	4.2
Natural Resource Mismanagement	2.2	3.1	3.9	5.1	6.8	2.6	4

Table 5: List of indicators measuring natural resource mismanagement.

[59] Like unsustainable coping strategies, the overuse of the commons indicator does not solely signify illegal practices. For instance, gathering wood in common areas is not inherently illegal. However, the framing of the question helps capture the excessive utilization of resources. In this context, it provides insights into the absence of regulations (or of enforcement of such regulations) that would deter these practices.

Tera is currently experiencing a significant deficit in natural resource management, with various types of detrimental practices prevalent. Bankilare and Abala also face multiple challenges in this regard. In Abala, abusive privatization practices are widespread, and respondents frequently point out the lack of law enforcement. In Bankilare, issues such as transparency deficiencies and the emergence of self-serving behaviours are prominent concerns.

B. How Does Natural Resource Mismanagement Increase Climate Change Risk and Weaponization?

The establishment of fair and transparent policies can enhance people's resilience in the face of climate-related events. Conversely, the absence of governance exacerbates the vulnerability of households in the region and hinders their ability to develop effective coping strategies. Deficits in natural resource management significantly heighten exposure to climatic hazards, which often exacerbates the impact of climatic shocks and stressors on individuals and communities.

Inadequate management practices may result in the depletion of essential resources, making communities more vulnerable to the adverse effects of climate-related events. For instance, the inability of governance to ensure fair access to water can increase the vulnerability of some communities in the face of a drought episode.

Furthermore, poor natural resource management can disrupt ecosystems and diminish their utility, exacerbating the impact of climatic events. For instance, an inability to control the use of forest services in the Tillaberi region, such as limiting the collection and cutting of wood, results in soil degradation, loss of access to shade, exposure to violent winds, etc. These consequences can generate a domino effect, amplifying the challenges posed by climate-related hazards and increasing the burden on individuals to cope with and adapt to these changes.

Natural resource mismanagement increases weaponization within communities

The consequences of climate change can compel individuals to resort to firearm ownership to safeguard their livelihood sources and personal safety. Such weaponization should be viewed as a defensive reaction employed by individuals lacking safety nets and collective mechanisms that could assist them in coping with the dynamics of climate change.

When examining farmer-herder dynamics, it is necessary to bear in mind that herders have often been the "victims" of unbalanced local natural resource policies. Customary authorities are the primary figures responsible for local conflict resolution mechanisms related to natural resources. Local chiefs are often autochthonous farmers who own the lands they cultivate. In contrast, herders are constantly moving and rarely "belong" to the locality they are in when engaging in a dispute with a farmer. These disputes are mostly related to damages caused by cattle to farming fields. There is a historical assumption that the field does not move, meaning that the farmer cannot be held responsible – the damages are caused by animals that circulate through the crops. Often, herders have had to pay a fine (and/or give up some of their animals) to compensate for the damages. Two dynamics are at play here that put herders in a weak position. First, the lack of representation at the local level impedes them from fairly participating in the dispute resolution process. Secondly, the traditional customary framework tends to prioritize and protect the land over the cattle when arbitrating between farmers and herders.

Figure 20: Pastoral area in Ouallam

Figure 21: Pond in Balleyara.

In light of this historical context, field extensions (e.g. farmers cultivating on wetlands and close to transhumance corridors) exacerbate grievances within the herders community. The frustrations accumulated over generations, stemming from historical victimization and intensified by competition for natural resources, increasingly drive herders to resort to weaponization for self-protection or retaliation. NSAGs' narratives target these feelings of frustration, addressing the diminished social status of herders and promising to improve their socioeconomic situation.[60] As a result, several customary chiefs from the Tillaberi region have fled their homes and are now based in Niamey, seeking protection after having been threatened by NSAGs or herders. Some have even been killed.

The absence of administrative power

Within the Tillaberi region, administrative power does not appear to extend its influence to the farthest reaches of rural areas. Administrative regulations apply at the communal level, within the village, but do not touch the remote areas where natural resource conflicts often occur. This dynamic reinforces the idea that the State is not assisting herders' communities and leaves them at the mercy of customary authorities and unfair local rules. The adoption of "holistic" resource management policies, involving a harmonious integration of administrative and customary law enforcement, along with diversification in conflict resolution actors and networks, would enhance the social acceptance of judgments among herders.[61]

Given these considerations, it is not surprising to note a negative correlation (-0.21) between local mechanisms for collective natural resource management and the conservative rejection of the State. The conservative rejection of the State (which appears in the model) measures the tendency of individuals to feel culturally threatened by State governance and institutions. It describes people who do not accept modern governance and indicates their tendency to distance themselves from the State and its rule of law. This insight suggests that the inadequacy or inefficiency of local mechanisms for collective natural resource management (such as common water points, cereal banks, programmes for sharing grazing and water rights, warrantee warehouses and rest areas for cattle) is associated with people's adoption of radical stances toward the State and a propensity for community withdrawal. Research indicates that frustrations arising from unfair and/or unclear natural resource policies can lead to radicalization, potentially resulting in the rejection of the State.[62]

When individuals perceive a lack of regulation from the State, encounter deficits in the distribution of resources and experience unfair treatment from the local authorities, they become more inclined to justify the ownership of a weapon. The connection lies in the sense of insecurity or competition over scarce resources, which may lead individuals to seek means of protection or empowerment by possessing weapons and/or joining NSAGs. This pattern underscores the crucial role of fair and socially accepted natural resource governance in maintaining the social fabric. More broadly, it prompts us to consider mechanisms through which the State can address the instrumental needs of communities to strengthen their belief in the State and, consequently, contribute to peace.[63]

---

60 Pauline Le Roux, "Ansaroul Islam: the rise and decline of a militant Islamist group in the Sahel", Spotlight, Africa Center for Strategies Studies, 29 July 2019.
61 Grace W. Ngaruiya and Jürgen Scheffran, "Actors and networks in resource conflict resolution under climate change in rural Kenya", *Earth System Dynamics*, vol. 7 (February 2016).
62 Benjaminsen and Ba, "Why do pastoralists in Mali join jihadist groups?"
63 Florian Krampe, Farah Hegazi and Stacy D. VanDeveer, "Sustaining peace through better resource governance: three potential mechanisms for environmental peacebuilding", *World Development*, vol. 144 (August 2021).

For instance, several interviews with traditional leaders during the qualitative phase of this study highlighted that intercommunity attacks were related to judgments made more than 20 years ago. In Banibangou, one of the local leaders reported that Fulanis attacked Zarma villages because of old unfair resolutions. He said that nowadays, the fact that most of them are armed with Kalashnikov assault rifles heightens those tensions and revenge feelings, leading to violent intercommunity disputes.

"It is vengeance linked to conflicts between farmers and herders [that] have endured. The frustrations that herders have experienced for a long time have led them to seek revenge, especially now that they have weapons. Most of the killings of village chiefs or influential individuals are connected to this."[64]

The interdependence of climate change, intergroup harmony and vulnerability to armed group recruitment

A serial mediation analysis illustrates how climate change's impact on the social fabric can contribute to the legitimization of NSAGs. This analysis shows how climate change disrupts harmony at the community level, thereby fostering social acceptance of NSAGs. The following section will delve into how these community dynamics affect recruitment vulnerability.

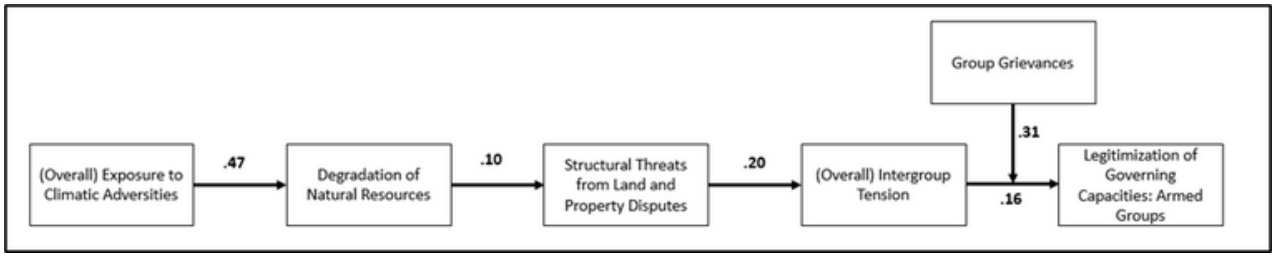

Figure 22: Pathway identified through a serial mediation analysis. The numbers above each arrow indicate the strength of the influence from one phenomenon to the other, with a higher number signifying a stronger impact on the next phenomenon.

1. Climatic adversities, through their cascading effects on resources, land disputes and, subsequently, intergroup tensions, can aid armed groups in legitimizing their roles, especially in regions or contexts where group grievances are already high.

2. The positive interaction between intergroup tension and group grievances suggests that the effect of intergroup tension on the legitimization of governing capacities by armed groups is more pronounced when group grievances are high.

3. This means that in contexts where there are substantial grievances among different groups, even a modest increase in intergroup tensions could lead to a significant enhancement in the legitimacy of armed groups.

4. DDR processes aimed at reducing group grievances could potentially weaken the link between intergroup tensions and the rise in legitimacy of armed groups, even if other factors (like climatic adversities) remain unchanged.

[64] Oumarou Dodo Moinkaila, Deputy Mayor of Tondikiwindi, Ouallam.

SECTION 3. KEY TAKEAWAYS

1. A climate security nexus exists in the Tillaberi region.

Conflicts over natural resources have frequently been recognized as resulting from a combination of diverse factors, including severe climatic stressors, situations involving resource scarcity, mismanagement of natural resources and inadequate justice mechanisms. The data gathered for this study enable the identification of correlation levels between these various phenomena, helping to highlight the existence of a coherent set of indicators related to each other. The analysis illustrates a climate security nexus, as it shows the associations between climate-related dynamics and security matters.

2. Climate change indirectly but actively contributes to making people more vulnerable to joining armed groups.

Climate change is not a direct cause of recruitment, as there is not a direct connection between experiencing climatic hazards or seeing one's livelihood undermined by climate change and vulnerability to recruitment. However, climate change is one aggravating factor among others that reinforce the structural hardships. For instance, climate change can be an opportunity for NSAGs to position themselves as alternative service and relief providers where Governments are weak or unresponsive. The more an area is impacted by climate change, the more susceptible it is to territorial control by NSAGs. The presence of banditry dynamics is also indirectly associated with climate change.

Exclusive exposure to climate change is not a direct cause of recruitment. Rather, climate change risk aggravates conditions that increase the vulnerability of individuals to recruitment. Climate change risk as it is correlated with other climate-related phenomena such as unsustainable coping strategies, tensions between farmers and herders, competition over natural resources and natural resource mismanagement should not be considered a distant spectre but an active agent in pathways to vulnerability.

3. Climate change is an aggravating factor.

Even though climate change may not directly cause conflict, extreme weather events and climatic stressors could amplify interpersonal violence.[65] The unavailability of natural resources leaves people in a vulnerable situation, dealing with climate degradation, NSAGs' presence and banditry. This configuration fuels violent tendencies among the population, leading them to consider joining armed groups.

---

65 Se Min Suh, Daniel A. Chapman and Brian Lickel, "The role of psychological research in understanding and responding to links between climate change and conflict", *Current Opinion in Psychology*, vol. 42 (December 2021).

Climate change repercussions do not occur arbitrarily; they are more pronounced in areas where people already contend with structural hardships. In this way, climate change is an aggravating factor, as it intensifies the vulnerability of individuals who are already fragile and besieged by disruptive dynamics. Notably, the severity of climate shocks in these areas not only compounds existing struggles but also presents an alarming opportunity for NSAGs to exploit the void left by weakened governance.

4. Low levels of human security can exacerbate the vulnerability to join armed groups.

Violent reactions and the urge to possess weapons seem to stem from despair and the absence of viable means to cope with various adversities (tensions between farmers and herders, the presence of non-state armed groups, banditry, climate change risk etc.), especially in areas where institutions are lacking and unable to offer safety nets to uphold human security. As previously discussed, when State institutions struggle to provide effective responses in the face of climate change, NSAGs may step in to offer essential services and support to help communities cope. A focus on human security indicators (physical security, food security, economic security) strongly correlated with access to services highlights this trend. Ensuring access to fundamental services such as health care, education, clean water and reliable infrastructure creates a robust foundation for human security. When individuals have reliable access to these essential services, their overall well-being is enhanced, and their resilience against various threats, both internal and external, is fortified.

The vulnerability to join armed groups should be understood within a framework where the absence of State presence intensifies multidimensional human insecurity, exacerbating the vulnerability of populations to various local and structural stressors. Violent reactions and weapons possession emerge as last-resort measures aimed at ensuring physical security and sustaining livelihoods.

5. Recruitment patterns are highly contextual and vary according to the socioecological situation of the community.

Many drivers can lead to recruitment. The trajectories candidates for NSAGs follow are highly individualized but also influenced by external constraints and opportunities. When viewing recruitment patterns through dynamics related to climate change, an individual living in a flourishing area who decides to join an armed group might do so for different reasons than an individual who does so in a dry land.

For instance, the availability of natural resources facilitates the adoption of unsustainable behaviours, drives migration, and fosters tensions between farmers and herders, especially in a situation of natural resource mismanagement. This configuration encourages weaponization tendencies and potentially leads to recruitment. On the other hand, the unavailability of natural resources leaves people in a vulnerable situation, dealing with climate degradation, the presence of NSAGs and banditry. This configuration fuels violent tendencies among the population and makes them more receptive to the security and financial incentives NSAGs promote.

6. Tensions between farmers and herders surface in the wake of poor natural resource governance.

Tensions between herders and farmers create a volatile environment, fostering individual inclinations towards violence and weaponization. The struggle for resources, particularly land and water, often escalates into conflicts that push individuals to justify the use of violence and seek arms ownership as a means of protection or control. In this context, the very fabric of community relationships becomes strained, amplifying the potential for individuals to resort to aggressive measures in response to perceived threats.

Tensions between herders and farmers occur in areas where regulations and local mechanisms may be lacking or ineffective. Individuals rationalize the use of weapons as a means of defence or asserting their

rights in these contentious situations. The absence of effective regulations and/or socially accepted local mechanisms in areas of herder-farmer tensions creates a vacuum that individuals may feel compelled to fill through self-defence or asserting perceived rights, often resorting to weaponization.

7. Natural resource management and social fabric are linked and crucial to preventing recruitment by non-state armed groups.

Deficits in natural resource management amplify exposure to climatic hazards. Poor natural resource management mechanisms instil in individuals a heightened sense of experience with climatic shocks and stressors. Natural resource mismanagement predicts higher levels of weaponization. When individuals perceive a lack of regulation or encounter inequities in the distribution of resources, they become more inclined to justify the ownership of weapons.

Natural resource mismanagement is correlated with various indicators reflecting deficiencies within the social fabric. This result suggests that natural resource governance and strong intragroup and intergroup bonds within communities are interdependent. Socially accepted natural resource management cannot be sustained in the absence of strong social bonds, just as social cohesion cannot remain stable when natural resource regulatory mechanisms are viewed as unfair by some parts of the population.

8. Weaponization dynamics manifest in specific local configurations.

The second direct driver of VtJ is related to the pattern(s) of weapon possession. The meta-indicator "willingness to hold a weapon" suggests the extent to which a person justifies the use of weapons – by themselves and others – for various goals. It reveals the degree of social acceptance of weapons. The results of this study show that the tendency to justify the use of weapons is more likely to appear in communities with a high level of suspicion between social groups, where the State is not present and where people are suffering from economic insecurity.

Individuals are more likely to justify the ownership of weapons when they view other social groups (i.e. ethnic groups, religious groups or professional groups) as a threat to their daily life. They suspect them of feeding violence in the community, they see them as a threat to their livelihood, and there is a history of disputes between them. The social acceptance of weapons also grows in communities encountering low levels of food and economic security. A lack of access to basic services (such as health, education, justice and police) is also characteristic of communities that tend to justify weapons ownership.

9. The violence activation system is a "missing link".

The vulnerability to join an armed group depends on how individuals handle the stressors in their environment. Factors like physical insecurity, marginalization and economic instability should be seen as stressors that potentially facilitate decision-making rather than triggers of the decision itself.

A specific combination of maladaptive life skills predisposes certain individuals to join armed groups (aggression, revenge tendency and justification of violence).[66] Together, they illustrate a psychosocial profile that is positioned in a triangle in the predictive analysis model. This "violence capital" is exacerbated by external stressors that hinder individuals from peacefully dealing with their disruptive environment. We consider here that even though climate change may not directly cause conflict, extreme weather events and climatic stressors can amplify interpersonal violence. The stressors coming from the environment (such as the presence of NSAGs, tensions between herders and farmers, and post-traumatic stress) exacerbate the violence capital at the individual level. In other words, people who can regulate their violent tendencies will be less prone to joining armed groups despite external stressors.

[66] "Aggression" measures the inability to restrain violent behaviours in daily life. "Revenge tendency" measures the inability to forgive when experiencing personal shocks such as losing assets or a family member, or facing humiliation. "Justification of violence" entails supporting the use of violence to achieve goals.

This hypothesis is supported by the region's high levels of economic insecurity. Only 14 per cent of respondents believe they can meet their basic needs, and over one-third of respondents report being unable to provide enough food for all household members. If economic insecurity were a direct driver of VtJ, we would anticipate a much higher number of candidates for armed groups. In our sample, 76 per cent were in a situation of food insecurity and 3 per cent showed a VtJ. Despite the prevalent economic insecurity in the region, the number of candidates for armed groups remains comparatively low. Given these findings, it is unlikely that economic insecurity is a direct driver of recruitment for armed groups. Instead, economic insecurity, along with other factors like physical insecurity and marginalization, likely functions as a precondition that facilitates the decision-making process.

The crucial differentiator seems to be the ability to avoid resorting to violence and armed actions. Individuals who lack alternative solutions and are unable to manage stressors peacefully may be more prone to resorting to violence, leading them towards joining armed groups. This tipping point in their decision-making process occurs later among those who find themselves with no other options but to handle the sources of stress through violent means. In summary, violent predispositions and the inclination to hold weapons constitute the two predictors that distinguish the minority of the population (3 per cent) showing a certain vulnerability to join.

10. NSAGs' narratives are performative in specific contexts exacerbated by climate change.

Based on the indicators that emerge from the predictive analysis, a range of hypotheses explain the reasons for the social performativity of NSAGs' narratives among some communities.

1. NSAGs thrive in an environment where violent tendencies persist (revenge tendency, aggression, justification of violence, willingness to hold weapons), generated by current and old disputes (tensions between farmers and herders) related to the competition for natural resources (unsustainable coping strategies), in a context of growing degradation and scarcity caused by climate change (risk of climate change).
2. The lack of human security (willingness to hold weapons), current and past violent experiences (PTSD), and the frustrations generated as a result operate as indicators of the incapacity of the State and local authorities to ensure the fulfilment of basic needs (conservative rejection of the State).
3. As a result, NSAGs can present themselves as an alternative governing body dedicated to repairing old injustices and restoring human security for those who fear or seek revenge.

Two recruitment trajectories could be identified based on the predictive model.

Profile 1. Emotion-driven trajectory

Individuals who show violent and emotional reactions in the face of stresses

- Internally Displaced Persons
- Living at the border of Mali or Burkina Faso
- Male
- Rural
- Herder
- 24-35 years old

Profile 2. Reasoning-driven trajectory

Individuals who normalize the use of violence in the face of stresses

- Male
- Rural
- Living at the border of Mali or Burkina Faso
- Farmer or Herder

Figure 23: Profiles of recruitment trajectories.

- An emotion-driven trajectory illustrating an individual's pathway towards recruitment triggered by emotional reactions to external stressors. This profile characterizes individuals who struggle to manage stress in a calm manner, instead responding with aggression to environmental challenges.
- A reasoning-driven trajectory illustrating an individual's pathway towards recruitment triggered by rationalizations for why people could join armed groups. This profile characterizes individuals who normalize disruptive behaviours and justify those attitudes (e.g. rejection of the State, justification of violence, unsustainable coping strategies, willingness to hold weapons).

Based on those two potential recruitment paths, the ANOVA analyses identified two types of profiles: one impulsive, the other more deliberate and thought out.

Age and gender characteristics play a role in the first trajectory: males between 24 and 35 years old are more prone to react and follow an emotion-driven pathway. While professional activity is also a key characteristic (i.e. herders are more at risk than other categories), geographic location facilitates this trajectory: living in a rural area at the border of Mali or Burkina Faso is a specific fragility factor. Finally, internally displaced persons are particularly vulnerable and prone to react violently to external stressors.

Gender characteristics also play a significant role in the second trajectory (i.e. males are more prone to adopt this pathway). Contrary to the first trajectory, both herders and farmers are particularly prone to follow this pattern.

SECTION 4. FRAMEWORK FOR DDR PROCESSES

This section lists the resilient factors identified throughout the analysis. This inventory can support the development of specific DDR processes to prevent recruitment into NSAGS.

1. Resilience analysis: how to disrupt the pathways?

Our resilience analysis helped to identify the capacities that allow people to cope with the adversities described in the preceding pathways.[67] To do so, the analysis assessed how people who face the same type of adversities cope differently. In other words, how do some people resist the "call for recruitment" despite experiencing adversities that make others vulnerable to recruitment? Three resilience analyses were developed. The first two focus on testing well-known rational drivers of recruitment,[68] while the third is grounded in the results from the current research:

- What protects people who might be vulnerable to joining for economic reasons?

The analysis centred on individuals who would potentially join armed groups "to earn money" and "to have something to do". By doing so, we addressed not only those motivated by financial incentives but also those facing unemployment.

- What protects people who might be vulnerable to joining for security reasons?

The analysis focused on individuals who might join armed groups "to protect my family", "to protect my cattle, land and goods", and "to protect my community".

- What protects people who tend to adopt violent tendencies?

The analysis was developed around individuals exhibiting violent reactions to stressors that causally worsen the violence capital in the model. The resilience analysis aimed to identify the characteristics of individuals who, despite exposure to adversities, did not adopt violent behaviours. The attributes of these individuals constitute their resilience capacity, as they "protect" and "prevent" the shift towards violence in a context that might otherwise encourage violent tendencies.

The resilience indicators identified should be considered potential leverages for DDR processes. These indicators are listed here; however, two practical documents will be produced, based on those results, to design recommendations tailored to the local context.[69] A framework for these DDR interventions is provided in point 2 of this section.

---

[67] Resilience is understood here as the collective set of abilities that enable individuals to confront a series of adversities and demonstrate greater effectiveness compared to others who are similarly exposed to those adversities. Lauren R. Miller-Lewis and others, "Resource factors for mental health resilience in early childhood: an analysis with multiple methodologies", Child and Adolescent Psychiatry and Mental Health, vol. 7 (22 February 2013).

[68] Raineri, "If victims become perpetrators".

[69] See the community violence reduction intervention proposal based on this research.

What protects people who might be vulnerable to joining for security and economic reasons?	
Social integration	The inclination to join armed groups increases when individuals experience loneliness and lack strong bonds with their family, friends and/or neighbours. Family and community connectedness protect individuals from vulnerability to join.
	Example: Family connectedness and social integration create a resilient framework for the young generation, enabling them to face challenges with a stronger sense of identity, support and community.[70]
Institutional dimension	The inclination towards recruitment is often fostered by a stressful environment, and those susceptible to joining are frequently unable to cope with stressors and shocks in a peaceful manner. Hence, public services serve as resources that help individuals to cope with adversities by improving their welfare and health.
	Example: Public services not only address immediate needs during crises but also contribute to long-term community well-being. Through education, health care, and other public resources, individuals are better equipped to understand, adapt to and mitigate the effects of climate-related challenges.
Community dimension and intercommunity dispute resolution	The recruitment tendency level within a community is linked to insufficient social cohesion, the presence of intergroup tensions and the inclination to view individuals from other social groups as threats. Tensions and unresolved disputes can fuel violent reactions and disruptive behaviours. Consequently, the presence of dialogue, arbitration and mediation mechanisms between communities may mitigate the inclination to join armed groups.
	Example: Transparent and inclusive natural resource management policies can provide a framework for resolving conflicts and establishing fair practices. This includes defining land tenure, grazing areas and water access rights, issues at the heart of tensions between farmers and herders.
Community-governance liaison	Certain communities may perceive themselves as being subjected to harassment by security forces, giving rise to grievances and inclinations towards revenge. The presence of intelligence systems and collaboration with security forces at the community level deter individuals from joining armed groups.
	Example: Establishing cooperation mechanisms and direct liaison between local populations and security forces can serve two purposes: enhancing security levels and reinforcing the relationship between communities and security forces.
Material capital for production	Economic insecurity and, more broadly, the absence of access to comfortable living conditions can serve as potential sources of distress that might facilitate the choice to join an armed group. Improved access to certain forms of material capital would enhance people's resilience against recruitment tendencies.
	Example: Advocating for enhanced storage equipment for food and water and material capital for production would assist individuals in bolstering their food security.

[70] Tanguy Quidelleur, "The local routes of violence in Eastern Burkina Faso: competition over resources, weapons and the State", Noria Research, 28 January 2020.

What protects people who tend to adopt violent tendencies?	
Support for gender equality	It encompasses several dimensions, such as support for women's inheritance rights, criticism of male privilege, support for women in leadership positions and support for women in the workforce.
	There is a well-established link between violent societies and gender inequality.[71] Several dynamics are typically observed in societies marked by high levels of violence or climate change consequences.[72] In such environments, there is often a normalization of aggressive behaviours and a devaluation of human rights, which can increase the incidence of sexual and gender-based violence. Efforts to strengthen gender equality in the context of conflict-affected and fragile States have proven to be effective.[73] These endeavours primarily focus on empowering women politically and economically, as well as ensuring improved access to quality services for women and girls. Moreover, as shown in Figure 22, males are more prone to vulnerability to join. Promoting gender equality practices would be an effective way to reduce toxic masculinity and violent dispositions.
Agency	Agency refers to an individual's capacity to make choices and act in pursuit of their own well-being and objectives in the civic and political space.[74] It illustrates their ability– and their confidence in that ability – to effect change in society.
	When someone feels powerless to control, directly impact or influence their environment, it can lead to frustration and potentially contribute to violent reactions. Passive citizenship results in a resigned, disconnected populace. The concept of agency prompts us to reflect on the relationship citizens maintain with their institutions and local authorities. The rejection of the State nurtures inclinations towards violence, as seen in the predictive model, thereby playing a role in the progression towards vulnerability to join.

2. Promoting an integrated approach combining MHPSS, peacebuilding and livelihood development

The model's results underscore the significant role of psychological vulnerabilities, such as the inability to control anger and forgive, as direct drivers for VtJ.

The results suggest the need for a transversal and multidisciplinary approach that considers climatic stressors, societal dynamics and individual psychological tendencies together. Programming that integrates mental health and psychosocial support (MHPSS), peacebuilding and livelihood development is the best chance for people who live in conflict-affected areas to thrive.[75] The MHPSS approach focuses on addressing the mental health and psychosocial needs of individuals and communities affected by various forms of adversity, including conflict, disasters, epidemics and other traumatic events. MHPSS programmes aim to promote and protect the psychological well-being of individuals and communities, helping them cope with the emotional and social impact of these challenging situations. Therefore, psychological challenges, such as the inability to control anger and the need to seek revenge, must be understood and treated in the context of environmental stressors, such as the presence of NSAGs, exposure to banditry and climatic adversities, as well as shocks such as resource scarcity, decreased livelihoods and physical insecurity.

---

71 "Why nations that fail women fail", *Economist*, 11 September 2021.
72 Elizabeth Smith, "Climate change in women, peace and security national action plans", SIPRI Insights on Peace and Security, No. 2020/7 (June 2020).
73 Helen O'Connell, "What are the opportunities to promote gender equity and equality in conflict-affected and fragile States? Insights from a review of evidence", *Gender & Development*, vol. 19, No. 3 (2011)
74 Spiros Gangas, "From agency to capabilities: Sen and sociological theory", *Current Sociology*, vol. 64, No. 1 (2016).
75 Abiosseh Davis and others, *Mind the Peace: Integrating MHPSS, Peacebuilding and Livelihood Programming – A Guidance Framework for Practitioners* (Geneva/Nairobi: Interpeace, 2022).

To summarize, the results of the research encourage the development of interconnected and cross-cutting DDR processes to strengthen and self-sustain constructive citizenship, social connectedness and resilient livelihoods.

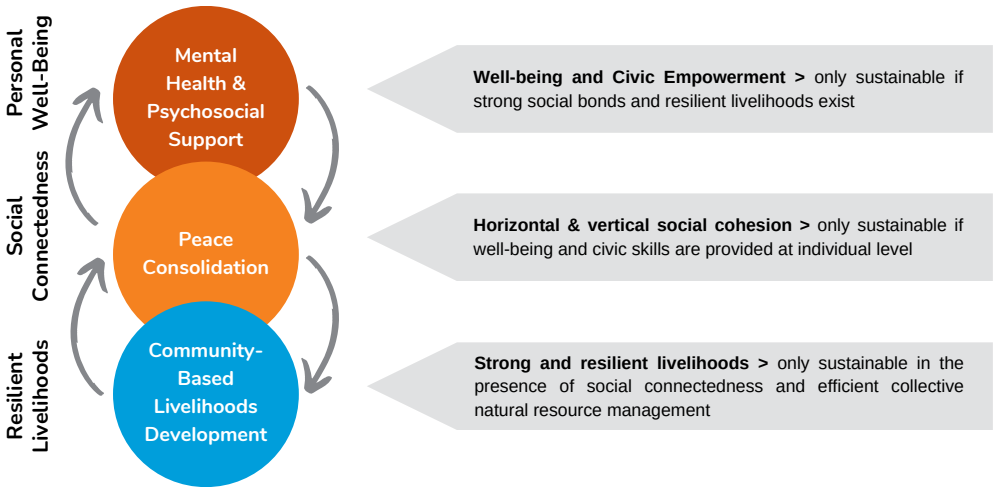

Figure 24: Framework for CVR interventions.

Individual Level: The pursuit of individual well-being and civic empowerment is necessary for the well-being of a population. However, well-being and civic agency are inextricably linked to the strength of social bonds and the resilience of livelihoods. Sustainable well-being and civic empowerment can only be achieved when communities foster robust social connections and develop livelihoods that can withstand challenges. In this symbiotic relationship, social cohesion and resilient livelihoods form the foundation for enduring well-being and effective civic engagement.

Community Level: The sustainability of both horizontal and vertical social cohesion hinges on the provision of well-being and civic skills at the personal level. For social bonds to thrive horizontally within communities and vertically across different societal tiers, individuals must be equipped with the necessary skills for personal well-being and civic engagement. Empowering individuals with these skills creates a ripple effect, contributing to the enduring strength of social cohesion in both horizontal and vertical dimensions.

Livelihood: The development of specific skills to support livelihoods is necessary. However, strength and resilience of livelihoods can only be sustained through a combination of social connectedness and efficient collective natural resource management. Building robust livelihoods requires not only individual efforts but also a cohesive social fabric that fosters collaboration and mutual support. In this interdependent relationship, the synergy between social connectedness and resilient livelihoods is essential.

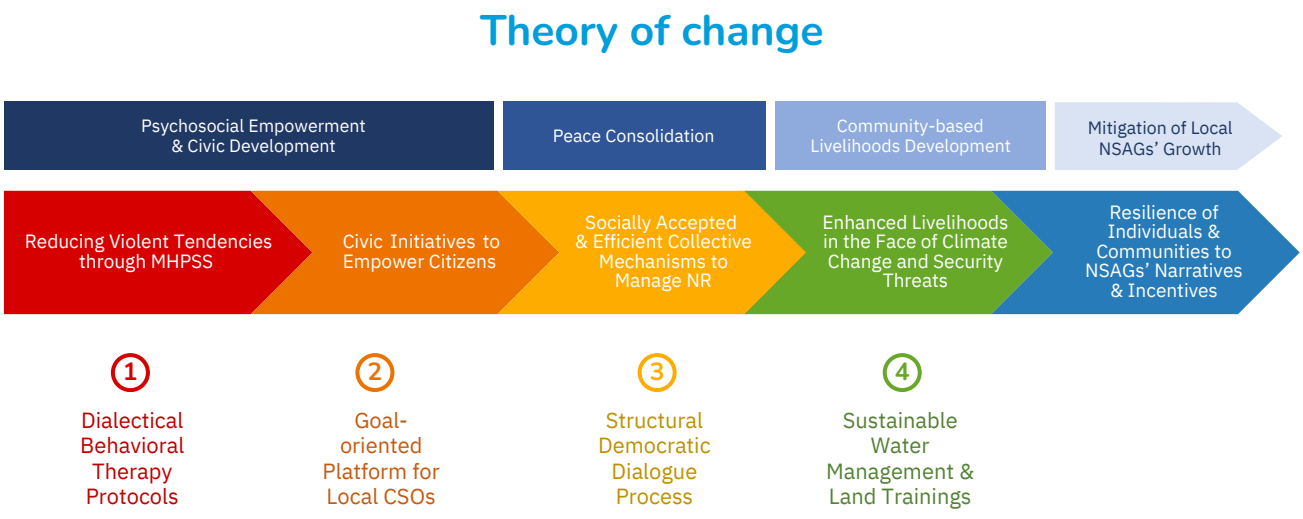

Figure 25: Theory of change.

Table 6 shows the structure of the approach and describes how each layer tackles the specific indicators that have been identified during the analysis.

Area	Level of interventions	Aim	Indicators identified
Psychosocial Empowerment & Civic Development Media	Psychosocial level	Mitigating drivers of vulnerability to join	Aggression, revenge tendency, justification of violence, post-traumatic stress disorder
		Strengthening resilience drivers	Forgiveness, respect towards human rights...
	Civic level	Mitigating drivers of vulnerability to join	Rejection of the State, unsustainable coping strategies
		Strengthening resilience drivers	Agency, critical mindset against NSAGs' narratives, gender equality
Peace Consolidation	Positive peace	Mitigating drivers of vulnerability to join	Farmer-herder tensions, unsustainable coping strategies, rejection of the State
		Strengthening resilience drivers	Community connectedness, intercommunity dispute resolution, community-State liaison, institutional connectedness
Community-based Livelihoods Development	Resilient livelihoods in the face of security and climate threats	Mitigating drivers of vulnerability to join	Willingness to hold weapons, exposure to banditry, exposure to NSAGs, unsustainable coping strategies, exposure to climate change

Table 6: Framework of the interventions.

ANNEXES

Annex A. Bibliography

Adger, W. Neil, Iain Brown and Swenja Surminski. Advances in risk assessment for climate change adaptation policy. *Philosophical Transactions of the Royal Society A*, vol. 376 (13 June 2018).

Allan, Harriet, and others. *Drivers of Violent Extremism: Hypotheses and Literature Review*. London: Royal United Services Institute, 2015.

Ammour, Laurence-Aïda. *How violent extremist groups exploit intercommunal conflicts in the Sahel*. Africa Center for Strategic Studies, 26 February 2020.

Asaka, Jeremiah O. Climate change–terrorism nexus? a preliminary review/analysis of the literature. *Perspectives on Terrorism*, vol. 15, No. 1 (February 2021).

Audu, Sunday Didam. Conflicts among farmers and pastoralists in northern Nigeria induced by freshwater scarcity. *Developing Country Studies*, vol. 3, No. 12 (2013).

Benjaminsen, Tor A., and Boubacar Ba. Why do pastoralists in Mali join jihadist groups? A political ecological explanation. *The Journal of Peasant Studies*, vol. 46, No. 1 (2019).

Bonfiglioli, A. M. Pastoralisme, agro-pastoralisme et retour: itinéraires sahéliens. *Cahiers des Sciences Humaines*, vol. 26, No 1–2 (1990).

Bouchet-Saulnier, Francoise. *The Practical Guide to Humanitarian Law*. 3rd ed. Lanham, MD: Rowman & Littlefield, 2013. Reproduced on the Doctors without Borders website Practical Guide to Humanitarian Law. Available at: https://guide-humanitarian-law.org/content/article/3/non-state-armed-groups (accessed on 20 December 2023).

Boukhars, Anouar. The paradox of modern jihadi insurgencies: the case of the Sahel and Maghreb. *Al Jazeera Centre for Studies*, 15 July 2018.

Buhaug, Halvard and others. One effect to rule them all? A comment on climate and conflict. *Climatic Change*, vol. 127 (2014).

Burke, Marshall B., and others. Warming increases the risk of civil war in Africa. *PNAS*, vol. 106, No. 49 (8 December 2009).

Buzan, Barry. *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*. Hertfordshire: Harvester Wheatsheaf, 1991.

Buzan, Barry, and Ole Wæver. *Regions and Powers*. Cambridge, UK: Cambridge University Press, 2003.

Clayton, Susan, and others. Psychological research and global climate change. *Nature Climate Change*, vol. 5 (July 2015).

Davis, Abiosseh, and others. *Mind the Peace: Integrating MHPSS, Peacebuilding and Livelihood Programming – A Guidance Framework for Practitioners*. Geneva/Nairobi: Interpeace, 2022.

De Coning, Cedric, and Florian Krampe. *Multilateral Cooperation in the Area of Climate-Related Security and Development Risks in Africa*. Oslo: Norwegian Institute of National Affairs, 2020.

Detges, Adrien. Close-up on renewable resources and armed conflict: the spatial logic of pastoralist violence in Northern Kenya. *Political Geography*, vol. 42 (September 2014).

Dimé, Mamadou, and M. Abdoulaye Nakoari Tambandia. *National Study on the Nexus between Migration, Environment and Climate Change*. Geneva: IOM, 2020.

Food and Agricultural Organization of the United Nations. The Niger: analysis of conflicts over transhumance in Diffa region, 2021.

Froese, Rebecca, and Janpeter Schilling. The nexus of climate change, land use, and conflicts. *Current Climate Change Reports*, vol. 5 (2019).

Gangas, Spiros. From agency to capabilities: Sen and sociological theory. *Current Sociology*, vol. 64, No. 1 (2016).

Griffin, Thomas E. Lake Chad: changing hydrography, violent extremism, and climate-conflict intersection. *Expeditions with MCUP*, vol. 2020 (2020).

Homer-Dixon, Thomas F. Environmental scarcities and violent conflict: evidence from cases. *International Security*, vol. 19, No. 1 (Summer 1994).

Homer-Dixon, Thomas and others. Synchronous failure: the emerging causal architecture of global crisis. *Ecology and Society*, vol. 20, No. 3 (September 2015).

Intergovernmental Panel on Climate Change. *Climate Change 2023: Synthesis Report*. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva: IPCC, 2023.

IPCC. "Annex I: Glossary". In *Global Warming of 1.5°C*, V. Masson-Delmotte and others, eds. Cambridge, UK: Cambridge University Press, 2018.

International Committee of the Red Cross. "Non-state armed groups". Available at: https://sri.icrc.org/understanding-support/actors-involved/non-state-armed-groups (accessed on 20 December 2023).

Inter-Réseaux. "Le pastoralisme a-t-il encore un avenir en Afrique de l'Ouest?", *Grain de sel*, No. 73–74 (July 2016–June 2017).

Krampe, Florian. Climate change, peacebuilding and sustaining peace. International Peace Institute Global Observatory, 13 September 2019. Available at: https://theglobalobservatory.org/2019/09/climate-change-peacebuilding-and-sustaining-peace.

Krampe, Florian, Farah Hegazi and Stacy D. VanDeveer. Sustaining peace through better resource governance: three potential mechanisms for environmental peacebuilding. *World Development*, vol. 144 (August 2021).

Lacher, Wolfram. Organized crime and conflict in the Sahel-Sahara region. Carnegie Endowment for International Peace, 13 September 2012.

Le Roux, Pauline. Ansaroul Islam: the rise and decline of a militant Islamist group in the Sahel. Spotlight. Africa Center for Strategies Studies, 29 July 2019.

Le Roux, Pauline. Confronting central Mali's extremist threat. Africa Center for Strategic Studies, 22 February 2019.

Le Roux, Pauline. Exploiting borders in the Sahel: the Islamic State in the Greater Sahara. Africa Center for Strategic Studies, 10 June 2019.

Le Roux, Pauline. Responding to the rise in violent extremism in the Sahel. Africa Security Brief, No. 36. Africa Center for Strategic Studies, December 2019.

Lordos, Alexandros, and Daniel Hyslop. The assessment of multisystemic resilience in conflict-affected populations. In *Multisystemic Resilience: Adaptation and Transformation in Contexts of Change*, Michael Ungar, ed. New York: Oxford Academic, 2021.

Lordos, Alexandros, and others. Societal healing in Rwanda: toward a multisystemic framework for mental health, social cohesion, and sustainable livelihoods among survivors and perpetrators of the genocide against the Tutsi. *Health and Human Rights Journal*, vol. 23, No. 1 (June 2021).

Masten, Ann S. Global perspectives on resilience in children and youth. *Child Development*, vol. 85, No. 1 (January/February 2014).

Ann S. Masten. Pathways to integrated resilience science. *Psychological Inquiry*, vol. 26, No. 2 (2015).

McGregor, Andrew. The Fulani crisis: communal violence and radicalization in the Sahel. *CTC Sentinel*, vol. 10, No. 2 (February 2017).

Miller-Lewis, Lauren R., and others. Resource factors for mental health resilience in early childhood: an analysis with multiple methodologies. *Child and Adolescent Psychiatry and Mental Health*, vol. 7 (22 February 2013).

Mobjörk, Malin, Florian Krampe and Kheira Tarif. Pathways of climate insecurity: guidance for policymakers. *SIPRI Policy Brief*, November 2020.

Mouafo Djontu, Herrick, and Karine Gatelier. Nord-Tillabéri : analyse du conflit lié à l'accès aux ressources naturelles. Le transfrontalier au cœur de l'analyse et de l'action (Niamey, Niger: Haute Autorité à la Consolidation de la Paix, 2017).

Ngaruiya, Grace W., and Jürgen Scheffran. Actors and networks in resource conflict resolution under climate change in rural Kenya. Earth System Dynamics, vol. 7 (February 2016).

Obioha, Emeka E. Climate change, population drift and violent conflict over land resources in northeastern Nigeria. *Journal of Human Ecology*, vol. 23, No. 4 (2008).

O'Connell, Helen. What are the opportunities to promote gender equity and equality in conflict-affected and fragile States? Insights from a review of evidence. *Gender & Development*, vol. 19, No. 3 (2011).

Ojielo, Ozonnia, and others. *Journey to Extremism in Africa: Drivers, Incentives, and the Tipping Point for Recruitment*. New York: UNDP, 2017.

Ostrom, Elinor. Governing the commons: the evolution of institutions for collective action. *Natural Resources Journal*, vol. 32, No. 415 (1992).

Pellerin, Mathieu. Les trajectoires de radicalisation religieuse au Sahel. Notes de l'IFRI, 2017.

Quidelleur, Tanguy. The local routes of violence in Eastern Burkina Faso: competition over resources, weapons and the State. *Noria Research*, 28 January 2020.

Raineri, Luca. If victims become perpetrators: factors contributing to vulnerability and resilience to violent extremism in the central Sahel. *International Alert*, June 2018.

Regan, Joshua M., and Sean K. Young. Climate change in the Horn of Africa: causations for violent extremism. *Behavioral Sciences of Terrorism and Political Aggression*, 4 May 2022.

Reuveny, Rafael. Climate change–induced migration and violent conflict. *Political Geography*, vol. 26, No. 6 (August 2007).

Salehyan, Idean. Climate change and conflict: making sense of disparate findings. *Political Geography*, vol. 43 (November 2014).

Save the Children. Children in Mali, Niger, Burkina Faso face greater risk of recruitment by armed groups. 20 October 2021.

Scheffran, Jürgen. Climate change and weather extremes as risk multipliers: tipping points, cascading events, and societal instability. In *Climate Change, Security Risks, and Violent Conflicts: Essays from Integrated Climate Research in Hamburg*, Michael Brzoska and Jürgen Scheffran, eds. Hamburg: Hamburg University Press, 2020.

Selby, Jan and Clemens Hoffmann. Rethinking climate change, conflict and security. *Geopolitics*, vol. 19, No. 4 (2014).

Siddiqi, Ayesha. Climatic disasters and radical politics in southern Pakistan: the non-linear connection. *Geopolitics*, vol. 19, No. 4 (August 2014).

Smith, Elizabeth. Climate change in women, peace and security national action plans. SIPRI Insights on Peace and Security, No. 2020/7 (June 2020).

Suh, Se Min, Daniel A. Chapman and Brian Lickel. The role of psychological research in understanding and responding to links between climate change and conflict. *Current Opinion in Psychology*, vol. 42 (December 2021).

Sweijs, Tim, Marleen de Haan and Hugo van Manen. *Unpacking the Climate Security Nexus: Seven Pathologies Linking Climate Change to Violent Conflict*. The Hague, Netherlands: The Hague Centre for Strategic Studies, 2022.

United Nations Development Programme. *Human Development Report 1994*. New York: Oxford University Press, 1994.

UNICEF. Niger flash update #4, 29 September 2023.

USAID. Mixed method study: gender differentiated drivers of violent extremism in central Sahel. Sahel CVE Research, 15 November 2021.

Von Uexkul, Nina, and Halvard Buhaug. Security implications of climate change: a decade of scientific progress. *Journal of Peace Research*, vol. 58, No. 1 (2021).

Walch, Colin. Weakened by the storm: rebel group recruitment in the wake of natural disasters in the Philippines. *Journal of Peace Research*, vol. 55, No. 3 (2018).

Why nations that fail women fail, *Economist*, 11 September 2021.

Annex B. Glossary of Indicators from the Predictive Model

Climatic Hazards	Weather-related events that can be extreme and include rapid-onset events (e.g. flood or hurricane) and slow-onset events (e.g. loss of biodiversity or change in rainfall patterns).
Exposure to Climate Change	Impact of climatic hazards on the socioeconomic situation of individuals (i.e. livelihood or health), reflecting the vulnerability of people to weather events.
Climate Change Risk	Combination of climatic hazard and exposure to climate change.
Natural Resource Management	Governance mechanisms responsible for controlling the use of natural resources that balance environmental sustainability, economic well-being and social equity.
Unsustainable Coping Strategies	Maladaptive individual behaviours towards ecosystems; these self-serving practices prioritize personal and immediate interests in accessing or utilizing natural resources.
Willingness to Hold Weapons	The extent to which a person justifies the use of weapons – both by themselves and others – for various goals; this indicator reflects the degree of social acceptance of weapons.
Revenge Tendency	Individual inability to forgive when experiencing personal shocks such as losing assets or a family member, or when facing humiliation.
Justification of Violence	Mindset that tends to support the use of violence to achieve goals.
Aggression	Inability to restrain violent behaviours in daily life.
Conservative Rejection of the State	Critical stance towards the current mode of governance, articulated around the idea that institutional functions jeopardize the identity and cultural values of the individual.
Tensions between Farmers and Herders	Level of conflictual relationships between farmers and herders; tendency to perceive the other group as a rival for access to natural resources and a threat to social cohesion in the area.
PTSD	Post-traumatic stress disorder.
Level of Territorial Control by NSAGs	Level of presence of NSAGs in a given area, ranging from sporadic presence to full administrative control.
Exposure to Banditry	Level of exposure to malicious and criminal acts perpetrated by bandits in the area, encompassing physical assaults, cattle raiding, robberies, kidnapping etc.

Table 7: Key terms

Annex C. List of Figures and Tables

MINISTRY OF FOREIGN AFFAIRS OF DENMARK

DANISH MINISTRY OF DEFENCE

UNOCHA/MICHELE CATTANI

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

FBA

Omega Etudes - Recherches - Formation - Services

SeeD

www.seedsofpeace.eu |
https://app.scoreforpeace.org/

Office 101 - 1st Floor, 14 Michalakopoulou Street, 1075 Nicosia, Cyprus