WEATHERING CHANGE

Exploring Connections between Climate Adaptation and Conflict Prevention in Mali

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Introduction

Climate shocks and stressors are devastating livelihoods, increasing food insecurity, deteriorating social cohesion, and threatening the overall well-being of communities across the globe.[1] Existing high levels of conflict compounded by extreme vulnerability to climate change further magnify these effects in fragile and conflict-affected situations (FCAS)[2] since the relationship between climate change and fragility forms a "vicious cycle".[3] Climate change serves as an indirect force by severely exacerbating existing sources of

[1] Burke et al., 2015a; Hsiang et al., 2013
[2] Mach et al., 2019
[3] Mercy Corps has been working at the helm of the climate-conflict nexus for over a decade. Through learning from our programming and research, Mercy Corps has come to understand the complex intersection of climate change, fragility, and conflict as a "vicious cycle". In this cycle, the effects of climate change increase issues of fragility, which can, in turn, exacerbate levels of conflict. In addition, high levels of fragility and conflict can limit a community's capacity to respond to climate shocks and stressors – increasing their vulnerability to the effects of

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fragility (i.e., economic, social, and political grievances), which in turn fuel higher levels of violence.[4] Knowing how best to address this vicious cycle presents a challenge for practitioners, scholars, and policymakers working within the climate-conflict nexus. Part of the difficulty stems from the tendency to treat climate and conflict as disparate global challenges and policy areas, rather than an integrated, interconnected issue. This may be due to the complexity of implementing and evaluating this type of cross-sectoral programming. Development programs focused on mitigating the effects of climate change tend to implement, research, and evaluate climate adaptation activities, whereas programs focused on mitigating conflict tend to implement, research, and evaluate traditional development and peacebuilding activities. Research shows examples of how climate adaptation efforts can at times unintentionally undermine peacebuilding efforts.[5] Less is known about whether and how climate adaptation and peacebuilding efforts complement and reinforce each other for greater, synergistic impact – especially in the context of a climate-sensitive FCAS.[6]

To help fill this evidence gap and build a greater understanding of the relationship between climate adaptation activities and peacebuilding outcomes (e.g., support for violence and social cohesion), Mercy Corps conducted an exploratory, mixed-methods research study focusing on the Ben ni Baara program in central Mali.[7] Ben ni Baara aimed to decrease conflict and violence in local communities using a cross-sectoral approach that addressed the underlying drivers of land and resource-based conflict.[8] The program location, combined with Ben ni Baara's programming approach, allowed us to examine the connections between individuals' participation in a variety of program activities – classified for the purpose of this study as "climate activities" and "non-climate activities"[9] and how this participation may influence peacebuilding efforts and outcomes related to the climate-conflict nexus. For the quantitative aspect of the study, we administered surveys to program participants with items related to support for violence, interpersonal relationships, natural resource management, household resilience, and conflict management mechanisms.

We triangulated our findings with qualitative analyses from Focus Group Discussions (FGDs) and semi-structured interviews with an additional sample of program participants.

Preliminary findings from this exploratory study suggest that participation in a combination of both climate and non-climate-based activities may be especially effective at deterring violence and enhancing peacebuilding outcomes.[10] Although exploratory, these findings add to the literature on climate adaptation programming and peacebuilding activities within the climate-conflict nexus. This report concludes with recommendations and considerations for future programs.[11]

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climate change. To learn more about Mercy Corps' programming approach, see Christian et al., 2023; Mercy Corps, 2023, and Hardaway et al., 2024. See also Jene & Tesfaye, 2020, Mercy Corps, 2023, and Bartolozzi, 2023 for findings related specifically to the climate-conflict nexus in fragile states.

[4] Ghani & Malley, 2020; Christian et al., 2023.

[5] Krampe et al., 2024; Krampe et al., 2021; Borras et al., 2020.

[6] Krampe et al., 2024

[7] The Ben ni Baara program (meaning "Work and Peace" in Bambara) was formerly known as "Bolstering Rural Economies and Knowledge of Workable Actions to Enable Reconciliation in Central and Southern Mali" (BREAKWATER).

[8] Mercy Corps Mali, 2024.

[9] "Climate activities" refer to climate adaptation activities that aim to address the more direct effects of climate change. "Non-climate activities" refer to traditional development and peacebuilding activities that aim to address the indirect effects of climate change. For more on these activities, see Program Context and Theory of Change.

[10] Due to the exploratory nature of this study, none of the findings can confirm effective causal mechanisms for these outcomes.

[11] Note that this brief is part of a multi-study, larger research effort. Therefore, elements in some of the following sections, such as the Program Context and Methodology sections, are based on an earlier report from this same research effort. See Radhakrishnan & Santara, 2024,

Program Context and Theory of Change

Mali

Mali is a landlocked country in the Sahel with a predominantly Muslim population composed mostly of the Mandé people, including the Bambara, Malinké, Peuhl, Senoufo, Soninké, and a diverse number of other ethnic groups. It is listed as one of 49 countries on the World Bank's list of FCAS for 2024.[12]

In addition to having high levels of conflict, Mali is also considered one of the countries most vulnerable to climate change due to the increase in drought and water scarcity in recent years.[13] This, in combination with extreme weather events such as the heatwave in April 2024, increases the vulnerability of communities across the country. Moreover, Mali's economy is largely based on agropastoralism and farming, which are especially vulnerable to climate conditions like changes in rainfall patterns.[23]

Communities in the regions of Mopti and Ségou in central Mali, where this study was conducted, rely on subsistence agriculture. Therefore, increases in temperature and decreases in rainfall have not only hindered food production and food access but have also made it harder for people to access natural resources, leading to a higher proportion of food-insecure households than the national average .[14] Tensions among communities in Mopti and Ségou have existed for generations but have been exacerbated by the competition to access natural resources.[15] In Mopti, for instance, a large part of the conflict between herders and farmers has been linked to access to land and other natural resources.[16] As these tensions escalate, they disrupt development activities, and efforts to support climate adaptation, creating a feedback loop where environmental degradation and conflict keep mounting while the conditions for the local population and the environment deteriorate.[17]

The Ben ni Baara Program

The Ben ni Baara program, funded by Sida and implemented by Mercy Corps in partnership with International Alert and Humanity & Inclusion between 2020 and 2024, was a human security program in central Mali. The program aimed to decrease the escalation of violent conflict in central and southern Mali by tackling the underlying causes of conflict in communities in the buffer zones between the relatively stable southern region and the more volatile central region (see Figure 1).

[12] World Bank, 2024. Mali was identified as an FCAS due to having met a "threshold of conflict-related deaths relative to the population".
[13] Tucker, 2023; see also Mali's profile in the Notre Dame's GAIN Country Index.
[14] USAID, 2018.
[15] Ursu, 2018.
[16] Maiga, Ousmane et al., 2019.
[17] Maiga, Ousmane et al., 2019.

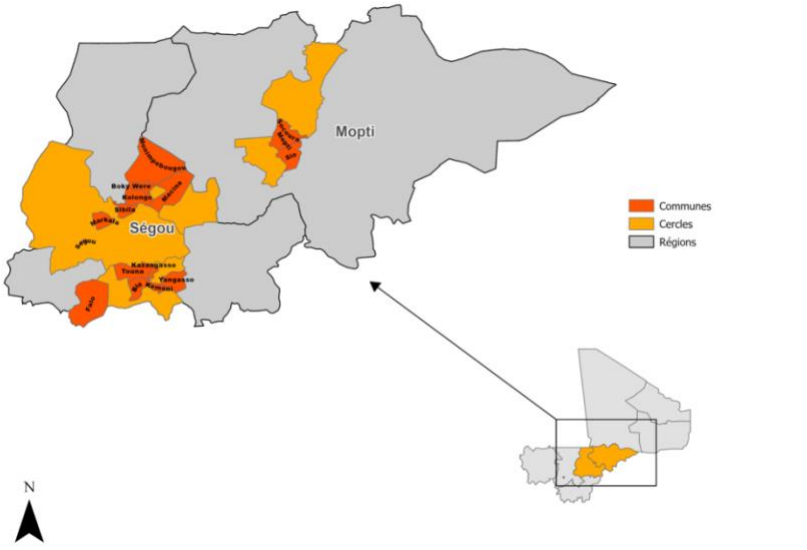

FIGURE 1. MAP OF BEN NI BAARA IMPLEMENTATION SITES IN MALI

The program's interconnected objectives addressed underlying conflict drivers across various sectors including social, ecological, economic, and political drivers. [18] Specifically, the program's theory of change suggested that enhancing conflict management and dispute resolution,[19] boosting economic and environmental resilience, and strengthening community relationships with state bodies for individuals, households, and communities would reduce conflict risk factors and improve the safety of the target population.[20] This study focuses on activities related specifically to Outcome 2, which aimed to "strengthen the economic and environmental resilience of individuals, households and communities, in order to protect them against recurring shocks that can lead to conflict."[21]

To achieve this outcome, the Ben ni Baara program implemented eleven different types of activities. This included five climate adaptation activities (i.e., climate activities) and six traditional development and peacebuilding activities without an explicit climate focus (i.e., non-climate activities) (see Table 1). Together, these activities addressed both the direct and indirect impact of climate-related shocks and stressors as well as the connection between the stressors and increases in violence and conflict.

Climate activities aimed to enhance individuals' overall climate resilience through activities such as specific climate resilience activities, pastoral calendars, forage diversification, Mobile Agricultural Micro-insurance (MAM), and water for grazing. Within the climate activities category, a subset, climate resilience activities. aimed to make climate-dependent livelihoods more sustainable, for example, by giving participants access to climate-resilient seeds and training in sowing seeds and proper use of fertilizer. The objectives of the climate resilience activities were to improve crop yields, which would then decrease food insecurity and help mitigate conflict over natural resources. Furthermore, the Ben ni Baara program installed boreholes as an accompanying measure to their activities to help address water shortages in market gardening and animal

[18] Mercy Corps Mali, 2024
[19] Objective 1 of the Ben ni Baara activities aimed to improve resource management by establishing conflict management committees such as Conflict Resolution Committees (CRCs) and revitalizing the Land Commissions (COFOs), including training them in conflict prevention and peaceful conflict management. For more for more information on details concerning Outcome 1, see Radhakrishnan & Santara, 2024
[20] Mercy Corps Mali, 2024.
[21] Mercy Corps Mali, 2024, 4.

watering sites. Other water points have also been rehabilitated to reduce surrounding conflicts and facilitate access to water for communities and livestock.

Some non-climate activities aimed to decrease levels of conflict through conventional peacebuilding activities, whereas other activities connected to underlying drivers of conflict, such as food supplement activities. Other non-climate activities aimed to decrease participants' dependence on livelihoods directly affected by climate change. These activities included helping participants gain skills in off-land activities through activities such as Village Savings and Loan Associations (VSLA) groups, support for company-based businesses, promotion of young trainees, and entrepreneurial support activities. The peacebuilding activities included the funding, revitalization, and implementation of a number of activities, such as: Conflict Resolution Committees (CRCs), Land Commissions (COFOs), an early warning system (EWS), and other community projects. (see Table 1).

Climate Adaptation Activities (Climate Activities)	Development and Peacebuilding Activities (Non-Climate Activities)
Climate resilience activities (e.g., climate resilient seed program, sowing training programs, and borehole installation)	Peacebuilding (e.g., CRCs, COFOs, and EWS)
Pastoral calendar negotiation and awareness	Entrepreneurial activities (e.g., promotion of young trainees, support for companies in difficulty)
Forage diversification	Village Saving Loans Activities (VSLA) groups
Mobile Agricultural Micro-Insurance (MAM)	Awareness of food supplements
Water points for grazing	

TABLE 1. BEN NI BAARA PROGRAM ACTIVITIES[22]

The Ben ni Baara program's focus on economic and environmental resilience, coupled with its cross-sectoral program design and location, provided a unique opportunity to explore the effects of a program that implemented both climate adaptation and traditional development and peacebuilding activities within a climate-sensitive and fragile and conflict-affected setting.

Methodology

This study uses data collected in 2023 through quantitative and qualitative methods. Quantitative analyses used survey data from one sample; qualitative analyses used data from Focus Group Discussions (FGDs) and semi-structured interviews from another sample. Both quantitative and qualitative samples comprised of participants in the Ben ni Baara program. The findings from this mixed-method research study offer insights into the role and effects of both climate adaptation and development and peacebuilding interventions that address climate change shocks on conflict and violence. The main research question guiding this study was:

[22] See Appendix, Tables 6 and 7 for more detailed descriptions of each activity.

"What effect does participation in different types of programming activities have on outcomes related to conflict and violence within a climate and conflict affected setting?"

Enumerators for both the quantitative and qualitative samples obtained verbal informed consent from all study participants before beginning data collection. During the informed consent process, enumerators explained the purpose of the study to the participants along with their role and responsibilities during the data collection. Participants were also assured that their confidentiality and anonymity would be maintained and that their participation was completely voluntary and could end at any time. Data collection occurred in private, secure locations to ensure confidentiality for the participants. The collected data was anonymized and stored in secure locations (either at a secure office location or on a password protected drive).

Quantitative

Sample

The quantitative sample included 679 respondents who were part of the Ben ni Baara program's annual survey data collection in January 2023[23] in the Ségou and Mopti regions (see Figure 1). Surveys were administered following a purposive sampling approach. Local Mercy Corps program staff collected data across eight communes in three cercles within Ségou[24] and across three communes within the Mopti Cercle in Mopti.[25]

Sample participants were primarily female (n=510; 75.11%). Although the sample included individuals from eleven different ethnic groups, 58.47% of the sample was spread across three main groups: Bambara (n=252; 37.11%), Soninke (n=83; 12.22%), and Minianka (n=62; 9.13%). Respondents were 16 to 80 years old with an average age of 42.93 years. The majority of the sample (n=378; 55.7%) were middle-aged adults between the ages of 40 and 70 years. The sample skewed heavily towards individuals who were married (n=619; 91.1%) and who identified agriculture/agropastoralism (n=447; 65.8%) and/or small business (n=292; 43%) as one of their top two main livelihood activities. Only a small percentage of the sample noted breeding/pastoralism as one of their main forms of livelihood (n=36; 5.30%) (see Appendix, Table 8 for descriptives of the full survey sample).

Activity Participation

The purpose of the annual survey was to examine the performance of each Ben ni Baara's activity implemented in the area (see Table 2). [26] The two most common types of respondents targeted for participation in the survey were VSLA members (n=314; 46.24%) and agropastoralists (n=284; 41.83%). The activities with the highest participation in the sample were the climate resilience program (n=326; 48.01%) and non-climate focused VSLA groups (n=331; 48.75%). Based on program design, participants varied with respect to the types of activities (non-climate, climate, or both) they participated in. Much of the sample participated in only non-climate activities (n=344; 50.66%); the remaining participated in either only climate activities (n=264; 38.88%), or both climate and non-climate activities (n=71; 10.46%). Women made up a higher percentage of participants within each of the different types of activities: only climate (n=167;

[23] Note that this survey was conducted while activities were still on-going. The Ben ni Baara program ended in March 2024.
[24] Communes in Ségou included: Bla, Kokry, Kolongo, Markala, Ségou, Sibila, Touna, Yangasso. Cercles included: Bla, Macina, and Ségou.
[25] Communes in the Mopti Cercle included: Mopti, Sio, and Secoura.
[26] See Program Context and Theory of Change for details on these activities.

63.3% of only climate activity participants); non-climate (n=299; 86.6% of only non-climate activity participants); both (n=44; 62% of participants who participated in both climate and non-climate activities).

Table 2 contains information about the sample distribution based on gender, age, occupation, and ethnic group. Furthermore, it includes the characteristics of the sample across three different participation groups:

1) Respondents who participated in only non-climate activities
2) Respondents who participated in only climate activities
3) Respondents who participated in both, climate and non-climate activities

Characteristics of Activity Groups[27]	Only Climate Activities		Only Non-Climate Activities		Both Climate and Non-Climate	
	n	% of activity group	n	% of activity group	n	% of activity group
Participants	264	100%	344	100%	71	100%
Female participants	167	63.3%	299	86.9%	44	62.0%
Main ethnic group	147	56%	205	59.6%	44	62.1%
Agriculture	261	98.9%	125	36.3%	61	85.9%
Small Business	37	14%	234	68.0%	21	29.6%
Pastoralism	19	7.2%	10	2.9%	7	9.9%
Average Age	46.95		39.31		45.52	

TABLE 2. SAMPLE CHARACTERISTICS BY ACTIVITY PARTICIPATION

Gender Differences in Activity Participation

The sample's participation in Ben ni Baara activities also varied by gender (see Table 3). Since the sample was skewed heavily female (as noted above), women represented a higher percentage of participants across all the different types of activities: non-climate (n=299; 58.6% of full sample); climate (n=167; 32.7% of full sample); both (n=44; 8.6% of full sample).

When examining differences of activity participation within each gender group, the majority of women in the sample participated in only non-climate activities (n=299; 58.6%), with fewer participating in only climate activities (n=167; 32.7%), and even fewer participating in both climate and non-climate activities (n=44; 8.6%). However, the majority of male respondents (n=97; 57.4%) participated in only climate activities, with just over 25% of them (n=45; 26.6%) participating in only non-climate activities and 16% (n=27) participating in both climate and non-climate activities.

[27] The main ethnic groups in the sample included Bambara, Soninke, and Minianka. In addition, respondents were asked to list their top three livelihood activities. Those who listed Agriculture, Small Business, and Pastoralism are included here. Note that some respondents may have listed two or all three of these activities as their top activities.

	Only Climate Activities	Only Non-Climate Activities	Both Climate and Non-Climate	Total
Female	167	299	44	510
Percentage of women in sample	32.8%	58.6%	8.6%	100%
Male	97	45	27	169
Percentage of men in sample	57.4%	26.6%	16%	100%
Total	264	344	71	679
Percentage of total sample	38.9%	50.7%	10.4%	100%

TABLE 3. ACTIVITY PARTICIPATION BY GENDER

Measures

Outcomes

To better understand the potential impact of program participation on levels of conflict and violence, we focused on examining relationships between type of activity participation (climate, non-climate, or both) and self-reported attitudes and behaviors related to support for conflict/violence and inter-group interactions (see Appendix, Table 9 for a detailed list of measures used in this study).

The survey included three self-report items related to participants' support for violence when defending: 1) a political cause, 2) one's community, and 3) one's livelihood. Participants responded on a 5-point Likert-scale ranging from 0 ("strongly agree") to 4 ("strongly disagree"). Lower scores reflected lower levels of support for violence.

The survey also included one self-report item related to inter-group interactions. This item read: "I consider the members of a livelihood group other than mine as a threat to my community." Participants responded on a 5-point Likert-scale ranging from 0 ("strongly agree") to 4 ("strongly disagree"). Lower scores reflected higher levels of perceived threat from other livelihood groups.

Mechanisms

In addition, we examined potential mechanisms affecting some of the relationships between the Ben ni Baara interventions and the outcome areas of interest. To examine these mechanisms, the survey included items about participants' understanding and opinions regarding local conflict resolution mechanisms and management of natural resources as well as elements of household resilience that may stem from participation in Ben ni Baara program activities.

Analytical Strategy

As noted above, 679 individuals participated in the Ben ni Baara program's annual survey in January 2023 in Ségou and Mopti and participated in at least one or more of the Ben ni Baara activities.

Given the categorical responses used in the survey, we used logistic regression models in most of our analyses. This allowed us to compare the differential effects in the outcomes of being in any of the three

types of respondent groups: 1) respondents who only participated in climate activities, 2) respondents who only participated in non-climate activities, and 3) respondents who participated in both climate and non-climate activities. In these analyses, the participants who only participated in non-climate activities comprise the reference group.[28] Therefore, comparisons are either between 1) individuals who only participated in climate activities vis-à-vis the reference group, or 2) individuals who participated in *both* climate and non-climate activities vis-à-vis the reference group.

The regressions used robust standard errors and included the following covariates: age, gender, and an indicator variable for the three largest ethnic groups in the sample (Bambara, Soninke, and Minianka), as well as an indicator variable for each cercle.[29] The analyses were primarily exploratory and focused on examining trends in the data and cannot be used to indicate causality.

Limitations

The main limitation of the quantitative component of this study lies in the unbalanced distribution of the study sample, as outlined above.[30] Overall, the survey sample overrepresents some groups over others in different types of activities. As a result, we could not analyze whether the different programs led to specific changes in preferences or perceptions amongst participants. Therefore, we cannot claim any type of causality with these findings because we cannot rule out the possibility that the sample composition for each specific intervention activity was driving the results, rather than the activity itself. However, despite these limitations, the quantitative findings show relevant and, in some cases, significant trends that can help guide future research, donor investments, and program design.

Qualitative

Sample

The qualitative findings in this report result from the analysis of data collected in May 2023 in central Mali. Mercy Corps recruited and hired a Mali-based data collection firm, CITRACO, as a consultant to collect the qualitative data. CITRACO collected, managed, organized, translated (from Bambara to English), and cleaned the data, and members of the Mercy Corps Research and Learning Team led the data analysis and writing. Team members from Mercy Corps Mali and Mercy Corps Research and Learning held regular calls with CITRACO during the data collection preparations, throughout the data collection, and post-data collection during data cleaning.

The data collection methods used included Focus Group Discussions (FGDs) and semi-structured interviews, both of which used respective question guides. Study participants were recruited through purposive sampling to meet specific selection criteria based on the data collection method (see Table 4).

[28] Mercy Corps staff only reached a limited amount of control group participants (24 respondents) during data collection. These individuals were not included in the overall sample size and analysis for this study and thus do not make up our reference group.
[29] Note: cercles are the second-level administrative unit in Mali.
[30] See also the balance table (Table 10) in the Appendix, which statistically compares differences in characteristics between respondents in each activity participation group.

Method	Selection Criteria
FGDs	✓ 18 years of age or older ✓ Living within the study sites ✓ Between 6 to 11 participants in each ✓ Sex-disaggregated FGDs ✓ Representation from participants in program activities, including: ○ Agricultural insurance activities ○ Forage activities ○ School farming activities
Interviews	✓ Representation from male and female participants ✓ 18 years of age or older ✓ Living within the study sites ✓ Representation from a variety of livelihoods, such as: ○ Farmer ○ Fisherman ○ Government worker ○ Housewife ○ Market gardener ○ Seamstress

TABLE 4. SELECTION CRITERIA FOR QUALITATIVE DATA COLLECTION METHODS

Table 5 below provides a summary of the number of FGDs and semi-structured interviews conducted within the six purposively-sampled study sites in central Mali – Bankoumana, Diedala, Foulabougou, Kouabougou, Massabougou, and Sibila – for a total of 10 FGDs (five groups with males, and five groups with females), and 38 interviews (20 with males, and 18 with females).

Commune	FGDs	Interviews
Bankoumana	0	4
Diedala	4	6
Foulabougou	2	8
Kouabougou	0	6
Massabougou	0	8
Sibila	4	6
Total	**10**	**38**

TABLE 5. SUMMARY OF STUDY SITES AND DATA COLLECTION METHODS

Analytical Strategy

Our qualitative analysis approach included content analysis of the FGD transcripts and notes taken during the interviews. We used the qualitative software MAXQDA for coding and analysis. We analyzed the data to identify the dominant themes/sub-themes in the data and grouped these themes into analytically relevant categories. Throughout the rest of this report, footnotes related to the qualitative results indicate a cross-reference of specific findings to the anonymized source documents where they can be found.

Limitations

The qualitative data also has limitations that may affect some of the findings reported. First, FGDs were conducted in only three of the five villages where the qualitative data collection took place. Yet, the interviews were conducted in all five villages. Second, all FGD participants were involved in at least one climate activity; however, we have limited information from participants about whether or not they were also involved in non-climate activities. This limits our ability to make inferences about their experiences and perceptions. Despite these limitations, the qualitative findings provide relevant support and are closely aligned with the study's quantitative findings. Further research in this area could help strengthen these insights, which are discussed in further detail below.

Key Findings

The preliminary findings from this study reveal interesting dynamics about the nexus between climate, fragility, and conflict. Our preliminary findings specifically highlight the potential role of climate adaptative and conflict-sensitive interventions in decreasing support for violence and increasing climate resilience in communities. Although exploratory, the findings from the current study align with Mercy Corps' Assessment for Adaptation to Conflict and Climate Trends (AACCT), which identifies the system dynamics through which climate change amplifies conflict, including macro trends, climate-related stresses, compounded shocks and stresses, and other fragility factors.[31]

The quantitative findings from this study reveal that the *type* of Ben ni Baara activity participants took part in (i.e., climate activities, non-climate activities, or both) may influence respondents' likelihood to support the use of violence, and whether they perceive members of other livelihood groups as a threat. The qualitative findings support the quantitative findings by providing insight from participants and community members who explained that participation in Ben ni Baara activities strengthened social cohesion in their communities while also increasing agricultural outputs and household resilience against climate shocks and stressors – all of which participants believed to culminate in an overall decrease in violence and conflict.[32]

Quantitative analyses with smaller subsets of the sample also revealed interesting trends regarding income generation, perceptions of conflict mechanisms, and natural resource management. Due to the smaller sample size used for these analyses, they are described below as additional future research directions rather than core preliminary findings.

[31] Bartolozzi, 2024; Christian et al., 2023.
[32] See Radhakrishnan & Santara, 2024 for additional findings related to the Ben ni Baara program fostering social cohesion.

Likelihood of Supporting Violence

Respondents who participated in both climate adaptation and in conventional development and peacebuilding activities [hitherto called 'non-climate activities'] were less likely to support violence. To examine participants' level of support for violence, we used quantitative analyses to examine participants' level of agreement that it is necessary to resort to violence in three different scenarios: 1) to defend a political cause, 2) to defend one's community, and 3) to defend one's livelihood(s).

For each scenario, respondents who participated in both climate and non-climate activities were *more likely to strongly disagree* with the statements than the reference group (i.e., respondents who participated in only non-climate activities); whereas respondents who participated in only climate activities were *less likely to strongly disagree* with the statements than the reference group.[33]

Respondents who participated in both climate and non-climate activities were **20 percentage points more likely to respond** that they strongly disagree that it is sometimes necessary to use violence for a political cause, and on average **25 percentage points more likely** to strongly disagree with using violence to defend one's community and/or one's livelihood(s) than the reference group.[34] These results are striking compared to those from respondents who participated in only climate activities. In general, respondents who participated in only climate activities were more likely to express support for violence than individuals in the reference group. Specifically, they were between 5 and 8 percentage points *less likely* to strongly disagree that it is sometimes necessary to use violence in the aforementioned scenarios, compared to individuals in the reference group (See Appendix, Table 11).[35]

These findings suggest that people who participated in both climate and non-climate activities may be less inclined to support violence than those who only participated in non-climate activities. However, the findings also suggest that individuals who only participated in climate activities may be more likely to support violence than those who only participated in non-climate activities.

These findings align with the wider literature that supports implementing climate adaptation interventions alongside other conflict management tools to limit overall levels of conflict as well as the literature that supports implementing climate interventions in vulnerable regions.[36] Moreover, since this study was conducted in relatively low-conflict areas in central Mali, these results contradict the claim that climate interventions and conflict mitigation efforts may be solely beneficial in areas with high levels of violence.[37] Specifically, some of the areas for this study had lower levels of conflict than average when compared to other areas across the country.[38] Over two-thirds of the respondents (72.56%)[39] indicated that they were not aware of any confrontations or conflicts in their community in the six months leading up to the survey (i.e., June – December 2022).

[33] The reference group comprised of participants who only participated in non-climate activities.
[34] All results for respondents who participated in both climate *and* non-climate activities were statistically significant at the one percent significance level.
[35] These results were statistically significant between the one and five percent significance level.
[36] van Schaik et al., 2019; Hegazi & Seyuba, 2022; von Soest, 2020; Sayne, 2011.
[37] Adams et al., 2018
[38] Based on information from the Uppsala Data Conflict Program, in the case of Mopti, the average number of conflict events (13.67) exceeds the national average of 5.68 between 2020 and 2022, the Ségou cercles where the study was conducted show conflict events closer to the country median of 1.67, with 2.33 events per year. Uppsala Conflict Data Program, "UCDP Conflict Encyclopedia."
[39] This question only had responses from a subset of the full sample (n = 605).

Likelihood of Threat Perception

Respondents who only participated in climate activities as well as respondents who participated in both climate and non-climate activities were less likely to see members of other livelihood groups as a threat. When looking at the potential effect of different types of interventions on inter-group attitudes and behaviors, we looked at participants' level of agreement with the following statement: "I consider the members of the livelihood group other than mine as a threat to my community."

Results indicate that participants in both comparison groups (i.e., participants in only climate activities as well as participants in both types of activities) seem less likely to consider members of other livelihood groups a threat than participants in only non-climate activities. Specifically, when compared to participants in the reference group, individuals who participated in both climate and non-climate activities were about **20 percentage points more likely to strongly disagree** and individuals who participated in only climate activities were **8.25 percentage points less likely to strongly disagree** with the above statement (see Appendix, Table 12).[40] These findings regarding participants in both climate and non-climate activities strongly reinforce the results above discussing these participants' lack of support for violence. These results also indicate an interesting nuance for respondents who participated in only climate activities in that they may support violence in certain scenarios, as discussed previously, but that does not mean they inherently see members of other livelihood groups as a threat. Participating in Ben ni Baara activities may have also helped those who participated solely in climate activities feel more secure about their livelihoods, reducing their concerns about potential threats from other groups.

Participants felt participation in Ben ni Baara activities increased social cohesion and decreased conflicts in the community. The aforementioned findings suggest that the combination of climate and non-climate activities seems to work as a reinforcing mechanism where participants feel less intimidated by other groups. This could speak to the influence the Ben ni Baara program has had on social cohesion within these communities. Mercy Corps and, by extension, the Ben ni Baara program defines social cohesion as "the sense of common purpose and trust among the members of a given group or region and the willingness of those members to engage and cooperate with one another to survive and thrive."[41] Mercy Corps identifies six dimensions of social cohesion: trust, belonging, shared identity, attitudes towards other groups, collective action norms, and civic engagement.[42]

Study participants from the FGDs and interviews discussed how their involvement in the Ben ni Baara program improved community social cohesion. Specifically, they believed meeting more people through the Ben ni Baara activities led to developing relationships, strengthening social cohesion, and even a decrease in conflicts in their communities.[43] In addition to meeting new people, participants often shared the skills they learned and/or their outputs from the activities with other community members. For example, one man explained how a program participant shared some of his onion output because he himself did not directly participate in the school farming program.[44] According to a gardener in Diedala, the Ben ni Baara program

[40] These results are all statistically significant at the one percent significance level.
[41] Mercy Corps Mali, 2021
[42] Olawole et al., 2022
[43] FGD Diedala_Men_Field School; Interview Diedala_Man_Gardener; Interview Foulabougou_Woman_Gardener.
[44] Interview Foulabougou_Man_Farmer.

"reduced our conflicts because before we didn't know each other well enough in the village. The program brings us together. Those little things that used to put us in conflict have become fun now."[45]

These findings suggest that respondents who participated in at least some type of climate activity may have strengthened social bonds with community members – including those from other livelihood groups – through their participation in Ben ni Baara activities. This may, in turn, lead to viewing people from other livelihood groups as partners in the community rather than a threat and to fostering a deeper understanding of the importance of keeping a peaceful relationship with members of other groups.

Perceptions on Preventing Climate Conflicts

Participants viewed increased agricultural output and food security as a potential means of conflict prevention. Study participants in the FGDs and interviews believed that the climate activities within Ben ni Baara helped strengthen their food security, which ultimately helped decrease conflicts within their communities. Specifically, the Ben ni Baara activities helped households better weather agricultural-related shocks resulting from climate change, such as learning how to properly sow seeds, use fertilizers, and gaining access to better seeds that grow well in the heavy rains.[46] Participants felt that climate activities enhanced agricultural productivity, which increased food security and income for farmers, leading to reduced conflicts within households (especially among spouses) and the wider community.[47]

Previous literature has revealed connections between climate shocks and conflict. Specifically, climate shocks and stressors have a notable impact on people's livelihoods[48] which in turn affects their income and food security.[49] These effects are usually more acute in areas with limited capacity and persisting inequalities,[50] such as the implementation areas for the Ben ni Baara program - making these findings both timely.

An example of how the participants believed increased agricultural output helps reduce conflicts relates to the conflict between farmers and pastoralists. Sometimes in these areas, pastoralists' livestock may wander onto farmers' lands and eat their crops, which can lead to conflict between farmers and pastoralists. However, some study participants believed that the stock breeders were able to provide enough feed for their animals due to the increased agricultural output from the Ben ni Baara activities. This meant that their animals no longer had to wander onto farmers' lands in search of food. In addition, one community had a livestock grazing area established through the Ben ni Baara program, which was also perceived to help reduce conflicts between farmers and pastoralists.[51] As one FGD participant from Diedala explained, "The Ben ni Baara project is very important in our life because it brought peace between us. It also fought against hunger." [52]

[45] Interview Diedala_Man_Gardener.
[46] FGD Diedala_Women_Fodder Activity; FGD Diedala_Women_Agricultural Insurance Activity; FGD Diedala_Men_Field School; FGD Diedala_Men_Fodder Activity; FGD Foulabougou_Women_Agricultural Insurance Activity; FGD Sibila_Men_Agricultural Insurance Activity.
[47] FGD Diedala_Women_Fodder Activity; FGD Diedala_Women_Agricultural Insurance Activity; FGD Diedala_Men_Field School; FGD Diedala_Men_Fodder Activity; FGD Foulabougou_Women_Agricultural Insurance Activity; Interview Foulabougou_Woman_Gardener; Interview Sibila_Man_Farmer.
[48] Barnett & Adger, 2007.
[49] Burke et al., 2015a; Hsiang et al., 2013.
[50] Koubi, 2019; Balestri & Caruso, 2024.
[51] FGD Diedala_Women_Agricultural Insurance Activity.
[52] FGD Diedala_Women_Agricultural Insurance Activity.

Future Research Directions

Natural Resource Management. The preliminary quantitative results show that while perceptions of access to natural resources were not differentiated across participants in different programs, perceptions of natural resource management outcomes were differentiated (see Appendix, Table 13). [53] More precisely, survey respondents who only participated in climate activities, as well as those who participated in both types of activities, were 33 and 50 percentage points (respectively) more likely to report that natural resource management had improved, compared to people who only participated in non-climate activities.[54] Findings regarding the mediating effect that natural resource access and management may have on support for violence were not statistically significant but do seem to reaffirm the previous findings.[55] These findings align with the literature showing how climate adaptation measures may improve natural resource management.[56] ***However, more research is still needed to understand the nuanced influence of climate adaptation efforts on natural resource management in conflict settings.***

Conflict Management Mechanisms. A subset of the survey sample responded to questions related to conflict management mechanisms (n=611). Within this subset, 97.38% (n=595) were aware of traditional structures/mechanisms for the prevention/management of functional conflicts in their community. The three mechanisms that participants reported being most aware of, included: 1) Village chief council (n=496, 83.4%), 2) Early Warning System (EWS)/Conflict Resolution Committees (CRC) (n=301, 50.58%), 3) Land Commissions (COFOs) (n=235, 34.61%). Overall, individuals in this subset (n = 595) showed widespread support for conflict management mechanisms as tools to prevent or limit confrontations. Specifically, 96.3% (n=573) reported traditional conflict management as useful, and 99.3% (n=591) expressed trust in these mechanisms. Given the high level of trust for these mechanisms, we explored whether a correlation existed between the types of activities survey respondents participated in and their stated reasons for trusting these mechanisms (e.g., reliability, fairness, etc.). Analyses did not reveal any significant differences between participants who participated in both types of activities and the reference group.

The broad trends highlighted in this subset align well with findings from research on Ben ni Baara's activities related to Local Peace Committees (LPCs). Specifically, Radhakrishnan and Santara (2024) found that strengthening and/or developing local conflict resolution structures, such as CRCs, can enhance trust between community members and empower communities to mediate conflicts - including those arising from environmental and agricultural-related stresses. However, that research did not specifically explore connections between these conflict management mechanisms and climate adaptation efforts. Therefore, taken together, these findings illustrate the importance of infusing conflict management mechanisms into climate adaptation efforts and the need for additional research in this area. ***Future research might be better situated to further examine relationships between conflict management mechanisms and climate adaptation efforts.***

Conflict Prevention through Income Generation and Household Resilience. We also explored if Ben ni Baara activities were linked to changes in household resilience against agricultural-related shocks,

[53] Note that only a subset of the sample (n=285) responded to questions regarding natural resource management and this subset was made up of primarily individuals who participated in only climate activities (n=250, 88%). Individuals who participated in both climate and non-climate activities (n=32, 11%) and the reference group (n=3, 1%) made up only 12% total of the respondents for this question.
[54] These results are statistically significant at the one percent significance level.
[55] Mediation analysis was used to explore to what extent the different combination of programs affected conflict preferences through the perceptions of natural resource access or management. Given the data configuration, these results are merely exploratory.
[56] Lawler, 2009; Sultana & Thompson, 2017

measured as the revitalization of income sources due to program participation and the self-reported capacity of the respondents to cope with economic or environmental shocks. Theoretically, as people become more resilient, competition to access limited resources may decrease and lead to less confrontation.[57]

In terms of increased income, 49% of the survey sample reported having revitalized an income-generating activity as a result of the Ben ni Baara program. However, analyses did not reveal a statistically significant difference in the probability of reporting revitalization of income sources across different program activities. In terms of increased household resilience, 57.5% of the sample reported they felt confident, and 22% felt completely confident that they could deal with shocks or economic and environmental pressures in the future.[58] Specifically, 76% of respondents who participated in only climate activities reported they felt confident or completely confident to deal with these types of shocks in the future. However, they were found to be less confident than individuals in the reference group. Individuals who participated in only climate activities were 10% less likely to report feeling totally confident in their ability to cope with future economic and environmental shocks[59] and were 4.2% less likely to report feeling at least confident in their ability to cope, compared with people in non-climate activities (See Appendix, Tables 14 and 15).[60] One explanation for this might be that although climate activities help people obtain abilities that are useful to face a shock, people who were in only climate-affected activities are perhaps more acutely aware of the impact of these shocks, thus making them more concerned about the potential effects of these types of shocks in the future. ***Future research could further explore potential effects of activity participation and income on household resilience to climate and conflict shocks and stressors.***

Program Recommendations & Conclusion

Although the findings of this study were exploratory, they underscore several key considerations for future programs using a cross-sectoral approach to address elements of the climate-conflict nexus. These recommendations derive from a very specific context within Mali, so must be adapted to the specific, local context of each program.

Identify the key conflict factors and drivers in the implementation area.
Before the design and implementation of programs that aim to influence violence and conflict, it is essential to understand the underlying factors and drivers of violence and conflict in the program implementation areas. An overarching Assessment for Adaptation to Conflict and Climate Trends (AACT) should be conducted in addition to assessments focusing on specific areas (as deemed relevant for the context), such as gender equality and social inclusion (GESI) and political economic analysis (PEA).[61] Conducting a variety of assessments will help to broaden the program team's understanding of the conflict drivers. This will then help identify which conflict drivers should be, and can be, targeted through program activities. When appropriate, participatory research methods should be applied during the assessments' data collection to center community voices throughout the assessment process.

[57] Pearson & Newman, 2019; McGuirk & Nunn, 2024.
[58] Note that only a subset of the sample (n=259) responded to questions regarding resiliency against economic and environmental shocks. This make-up of this subset are as follows: respondents who participated in only climate activities (n=110, 42%), respondents who participated in both climate and non-climate activities (n=22, 8.5%) and the reference group (n=127, 49.5%).
[59] Statistically significant at the 5% significance level.
[60] These results are only statistically significant at the 10% significance level.
[61] Bartolozzi, J. (2024). A guide to conducting an Assessment for Adaptation to Conflict and Climate Trends (AACCT). Washington, DC: The Resilience Evaluation, Analysis and Learning (REAL) Associate Award.

Develop program activities that aim to target specific conflict drivers.
Once the key conflict factors and drivers have been identified through the aforementioned types of assessments, program activities should be designed to target *specific* conflict drivers and climate vulnerabilities based on the most pressing needs in the local context and program implementation area(s). The causes of conflict and violence vary greatly, ranging from institutional factors to interpersonal factors, and it is impossible to impact all these factors within one program. Instead, focusing on a specific set of conflict drivers can lead to more focused program activities designed to have a greater impact on violence on a more targeted scale. Participatory methods are also important here so that communities themselves can voice the most pressing conflict drivers to address.

Consider combining climate-sensitive activities with conflict-awareness activities.
Programs should be designed at the outset so that program participants simultaneously engage in both climate-sensitive activities *and* conflict awareness activities. For example, supporting the development of off-land activities can help build resilience against the effects of climate change. Given the intricate connections between climate and conflict, it is important to raise awareness and educate communities about the relationship between these two fields, which can become siloed during program implementation. Additionally, given the climate-dependent nature of many livelihoods, conflict education in combination with climate sensitive activities could help mitigate conflicts in the future among certain communities, depending on the context.

Make income-generating activities more effective at reducing conflict.
Programs that include income-generating activities (IGA) must be designed in a conflict-sensitive manner to help reduce violence and conflicts. Specifically, IGAs should consider the inclusion of activities that engage and educate participants on conflict dynamics in their communities alongside their traditional livelihood-focused activities. This is particularly important in contexts where livelihoods and IGAs are influenced by the climate, such as agriculture, since changes in the climate can affect income generation and could potentially lead to hostilities and conflict between communities engaged in different IGAs. Incorporating conflict education activities from the start of a program empowers participants to become more aware of different community-level conflict reduction and prevention measures that can help promote peace in the long term.

Combine activities that foster livelihoods that are more resilient to the effects of climate change.
Depending on the context, greater consideration should be given to broadening the diversity of livelihood opportunities to ones that are less vulnerable to climate shocks and stressors. This could potentially help prevent climate-related conflicts between different livelihood groups, such as agriculturalists and pastoralists. Ideally, these activities should aim to foster *existing* skills among the program participants so they can explore new income-generating opportunities without having to learn an entirely new skill set.

Empower program participants to expand impact to other localities after funding ends. Within the program design phase, steps to ensure the activities' sustainability after the program ends should include empowering participants to expand the impact of the program to neighboring localities. These activities would vary depending on the context and local needs. However, such activities could include education and awareness raising campaigns on climate and conflict, peer training on climate-sensitive conflict awareness, and mentoring opportunities with members of other communities engaged in the same livelihoods that are vulnerable to climate-related conflicts. These efforts could be particularly valuable in helping prevent spillover effects of climate-related conflicts in one community affecting a neighboring community.

Conclusion

Climate change is already having devastating consequences for populations worldwide. When different groups compete among themselves for access to scarce natural resources, climate change can exacerbate these tensions even further and potentially increase conflicts between the groups.[62] Consequently, mitigating some of these threats through climate-resilient and adaptive activities could help reduce such tensions and decrease the likelihood of violence and conflict, particularly when these activities are implemented alongside conflict mitigation programming.[63] Furthermore, given the close interconnection that exists between climate adaptation and conflict, reducing conflict pressures can also facilitate the implementation of climate mitigation and adaptation initiatives.

Though exploratory, this study shows that combining climate adaptation and conflict-sensitive interventions may be an effective way to deter violence. Indeed, the Ben ni Baara program was most successful when individuals participated in both climate and non-climate activities, resulting in lower support for resorting to violence in different scenarios and a lower chance that they would find members of other livelihood groups as a threat. In turn, these outcomes could potentially help strengthen social cohesion and reduce violence within local communities.

When exploring how these activities affected participants' perceptions of natural resource management and resilience, we discovered that the Ben ni Baara program also enhanced overall knowledge and positive perceptions of natural resource management, particularly among those participating in climate and non-climate activities. Since poor natural resource management is a common source of conflict, these results are encouraging, even if further research in this area is necessary.

While the findings in this study are exploratory and cannot be tied to causal claims, they provide promising insight into the roles of climate-adaptive activities not only on violence and conflict levels, but also on helping to make communities more climate-resilient. Future research could expand upon the existing evidence regarding the influence of climate adaptation initiatives on conflict. Specifically, further research should explore what combination of activities is more effective at promoting social cohesion, increasing trust, and reducing conflict potential whilst also building climate resilience and supporting climate adaptation efforts. More research is also needed to disentangle the role of various mechanisms, such as understanding the influence of climate adaptation efforts on natural resource management in FCAS and on community trust in conflict management mechanisms. Evidence on the relationship between the type of program activity participants engage in and the influence on their income and resilience to shocks would also be beneficial, as well as understanding how these programs can prevent elite capture of natural resources and promote more equitable access and management.

See Appendix.

[62] Pearson & Newman, 2019; McGuirk & Nunn, 2024.
[63] van Schaik et al., 2019; Hegazi & Seyuba, 2022; von Soest, 2020; Sayne, 2011.

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