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LEVERAGING CLIMATE-SMART AGRICULTURE FOR PEACE: INSIGHTS FROM A BUNDLE OF INTERVENTIONS IN GHANA

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INITIATIVE ON
Fragility, Conflict,
and Migration



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ABOUT US

CGIAR aims to address gaps in knowledge about climate change and food security for peace and security policies and operations through a unique multidisciplinary approach. Our main objective is to align evidence from the realms of climate, land, and food systems science with peacebuilding efforts already underway that address conflict through evidence-based environmental, political, and socio-economic solutions.

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SECTION 1:

CONTEXT

Climate change is one of the biggest crises of our time. Climate threats range from higher temperatures, heavy rainfalls and floods, erratic precipitation, droughts, desertification, and land degradation. This has negative implications on the quality and quantity of natural resources, such as land and water, agricultural productivity, rural livelihood options, food prices, and nutrition security, particularly when there is a lack of adaptation capacities and preparedness measures (Pacillo, 2024). Farmers are at the forefront of the climate crisis where their livelihoods are being jeopardized, and they are faced with many challenges to secure water, energy, and agriculture inputs, and maintain agriculture productivity. This heightens the risk of competition over natural resources and aggravates grievances and structural inequalities related to land rights and ownership as well as land access, management, and governance. In Africa, land-related issues are among the triggers of many violent disputes (Medina et al, 2024). For instance, communal violence in Nigeria and Sudan is tied to competition over scarce fertile land and poor resource governance (Bruce and Bourdeaux, 2013).

Accordingly, the preservation and restoration of food, land, and water systems is critical for conflict prevention and sustaining peace, particularly in the context of increasing climate threats. Early warning systems, climate-smart agriculture practices, and resilient infrastructure that contribute to livelihood security and disproportionately help the most vulnerable people create enabling conditions for peacebuilding, sustaining peace and long-term sustainable development – through the provision of income-generating opportunities, strengthening social cohesion and communal trust-building, alleviating poverty and improving living conditions (Pacillo, 2024). In turn, failure to mainstream climate resilience in food, land, and water programming can become the source of “divergent” or maladaptation episodes or situations where climate adaptation exacerbates vulnerabilities and increases competition over resources or generates grievances that can increase the risk of conflict (Pacillo, 2024; Zografos, 2014).

Despite the increased recognition of the intricate and reinforcing relationship between climate change, food, land, and water systems, and peace, sustaining peace and security have not yet been systematically tackled as part of the formal agenda of the international negotiations on climate change. However, over the past few UNFCCC Conferences of the Parties (COPs), this topic has gained stronger traction in the COP platform where the peace angle has been incorporated in many of the discussions around climate adaptation and resilience, particularly when it comes to food and water security, land issues, displacement and migration, and sustainable livelihood. Moreover, a stronger focus has been put on the complex intersection of climate change impacts and structural vulnerability, specifically climate-related social vulnerabilities that vulnerable and marginalized groups, including rural women and youth, are exposed to. However, there has also been strong emphasis on the

positive agency and leadership of marginalized groups in addressing these challenges and exploring ways to support them and bolster their resilience.

On top of these efforts - and for the first time ever – the COP27 Presidency launched an initiative titled: [Climate Responses for Sustaining Peace \(CRSP\)](#) with the aim of ensuring that integrated climate responses contribute to sustainable peace and development in line with national ownership and context specificity. Moreover, the COP28 Presidency featured a Relief, Recovery and Peace Day in the COP program, and issued the [COP28 Declaration on Climate, Relief, Recovery, and Peace](#) to call for bolder collective action to build climate resilience at the scale and speed required in highly vulnerable countries and communities, particularly those threatened or affected by fragility or conflict, or facing severe humanitarian needs. More than 90 countries along with international organizations and UN agencies pledged commitment to contribute to the operationalization of the declaration. Likewise, the COP29 Presidency emphasizes that “a pressing issue on the COP Agenda is how to pre-empt potential conflicts that may arise from food and water shortages stemming from climate change” (COP29, 2024).

These concerted efforts aim to leverage the COP platform for building bridges between climate adaptation and peacebuilding and galvanizing action to transform climate adaptation into an instrument for conflict prevention and sustaining peace. This also coincides with the UN Secretary General’s ‘A New Agenda for Peace’ which recognizes climate, peace and security as a political priority and calls for strengthening connections between multilateral bodies to ensure that climate action and peacebuilding reinforce each other and reiterates the importance of advancing integrated approaches to climate, peace and security.

On the Road towards COP29, it is timely to take stock of positive and granular examples of local peace-positive climate adaptation measures and address a practical gap on how peace positive climate-smart agriculture can look like at the local level. Thus, this brief provides a [practical example and insights on the design and implementation of a bundle of interventions in Jirapa Village in Ghana, showcasing how climate-smart agriculture practices can strengthen peace and resilience at the village level. This brief aims to enrich discussions around the practical implementation of peace positive climate adaptation interventions in agri-food systems and enhances “sensemaking” of the climate, food, and peace nexus at the local level.](#)

This practical brief is produced by the Alliance of Bioversity and CIAT’s MENA Regional Climate Security Hub in its role as co-lead of CRSP’s Pillar 2: Sustaining Peace through Climate-resilient Food Systems. The brief is an outcome of a series of consultation meetings with the Food and Agriculture Organization (FAO) and the Cairo International Center for Conflict Resolution, Peacekeeping, and Peacebuilding (CCCPA) and showcases practical work on climate-resilient and peace-positive food systems transformations that was carried out by the CGIAR FOCUS Climate Security Team in Africa.

SECTION 2:

CONSOLIDATING PEACE THROUGH DEPLOYING A BUNDLE OF TARGETED CLIMATE-SMART PRACTICES AND TECHNOLOGIES

In the context of increasing climate impacts on root causes of conflict and fragility, agriculture adaptation practices and technologies do not only need to be climate-resilient but also contribute to conflict prevention, peacebuilding, and socio-economic development. CGIAR has more than 12 years of experience in designing and implementing bundles of targeted climate-smart interventions at villages across the global south, aiming to strengthen peace and resilience. This section presents an overview of CGIAR's Climate Smart Villages (CSV) – an innovative approach addressing the nexus of climate, agriculture, and peace. It also highlights insights into the approach's peace-responsiveness in the context of Jirapa, Ghana, evaluated using the Climate Security Sensitivity Tool, a dedicated assessment tool for climate security programming.

THE CLIMATE SMART VILLAGE (CSV) APPROACH IN JIRAPA, GHANA

The Climate-Smart Village (CSV) approach is based on several Climate-Smart Agriculture (CSA) technologies and practices developed by the CGIAR Research Program on Climate Change, Agriculture, and Food Security (CCAFS). A CSV is a village in which farmers, researchers, and other partners test bundles of CSA technologies, practices, and services in an integrated and participatory manner to achieve climate adaptation, mitigation, and food security (Tetteh et al., 2020). This approach was implemented in Jirapa between 2012 and 2021. The bundle of interventions included improved climate-resilient crop varieties, agroforestry, water harvesting, organic farming, the delivery of climate information services, tree planting, income-generation, support in designing microfinance solutions, as well as market services (Ouedraogo M, & Bayala J. 2017). Table 1 details the specific interventions that took place in Jirapa's CSV.



Image 1: Bunds and tied ridges across fields in Jirapa's CSV.

<p>Climate Smart Agricultural practices</p>	<ul style="list-style-type: none"> • Improved seeds of biofortified maize, sweet potato, millet, non-shattering soybean • Crop rotation (mixed legume/non-legume) for maize and cowpea • Bunds and tied ridges across maize fields • Intercropping of cowpea with jatropha • Zero tillage practices for soybean fields • Inorganic fertilizers (NPK) for maize fields • Tree planting of cashew trees • Intercropping of moringa and cashews
<p>Climate Information Services (Agrometeorological services)</p>	<ul style="list-style-type: none"> • Agro Advisories on fertilizer and pesticide application • Agro Advisories on varieties applied under the forecasted Information • Daily forecast • Seasonal forecast • Weekly/10-day forecast
<p>Market services</p>	<ul style="list-style-type: none"> • Input subsidies • Price support
<p>Financial services</p>	<ul style="list-style-type: none"> • Informal individual credits/loan • Informal group loans • Informal saving groups • Weather-based insurance

Jirapa, located in Ghana's Upper West Region, experiences diverse climate and socio-economic vulnerabilities. Agriculture, the primary livelihood, is heavily impacted by climate stressors such as erratic rainfall, prolonged droughts, desertification, and land degradation. These environmental challenges have reduced agricultural productivity, crop failures, and food insecurity, with one in five people affected (Derbile et al., 2022; Dapilah et al., 2020). The economic crisis in 2022, marked by a steep depreciation of the cedi (unit of currency of Ghana), worsened the situation. The depreciation raised the cost of farming inputs, while inflation drove food prices higher, making essential supplies less accessible to both farmers and consumers (Kwakye et al., 2023).

Additionally, the region faces growing socio-political challenges. Competition over dwindling resources, such as land and water, has intensified, leading to conflicts between ethnic groups and livelihood groups, particularly between sedentary farmers and Fulani pastoralists (Dary et al., 2017). Illegal mining has further degraded the environment, causing deforestation, soil erosion, and water pollution, exacerbating land scarcity and farmers' displacement (Baddianaah et al., 2023). Moreover, Jirapa's proximity to the Burkina Faso border brings additional insecurity risks. Armed groups and refugees fleeing conflict have increasingly crossed into northern Ghana, destabilizing local communities. The presence of illicit gold mining and cattle rustling, often linked to armed groups, further strains the already fragile security and economic conditions in the area (Konrad Adenauer Stiftung, 2021).

RESULTS FROM THE APPLICATION OF THE CLIMATE SECURITY SENSITIVITY TOOL (CSST) TO ASSESS THE PEACE RESPONSIVENESS OF THE CSV APPROACH IN JIRAPA, GHANA

The convergence of multiple vulnerabilities makes the village an important case study for understanding the relationship between climate adaptation, insecurity, and fragility risks. By connecting the drivers of conflict and insecurity with the different climate-peace mechanisms, the CSST represents together a tool to support practitioners developing climate-smart agricultural initiatives in avoiding maladaptation and its associated unintended consequences, avoiding conflict relapses, and contributing to peacebuilding (Sarzana et al., 2023b). It provides context-specific recommendations to redefine and improve a proposed program design.

The Climate Security Sensitivity Tool (CSST) was applied to the CSV implemented in Jirapa to define the peace potential of the bundle of interventions, as well as to recommend strategies to improve its suitability in addressing local drivers of conflict and insecurity (Sarzana et al., 2023a).

The CSST employs a two-step process. In the first step, the area where the project is located is characterized and conflict drivers are defined and mapped against climate-peace mechanisms to identify which mechanisms should be prioritized given the specific local risks. In the second step, the user scores the extent to which their intervention contributes to each of these mechanisms. The climate-peace mechanisms assessed by the CSST are the following:

1. economic development
2. building institutions
3. building trust and cooperation
4. resource sustainability
5. enhancing knowledge
6. building capacity and resilience

The results of the CSST highlighted how this bundle of interventions contributed to different peace dimensions at the village level while shedding light on poor efforts regarding other programmatic areas. Specifically, findings show that the CSV intervention fortifies subnational institutions and strives to gather evidence at local scales to draw lessons for policymakers. Nonetheless, the CSV efforts in institution-building are limited. These efforts should be increased to strengthen the enabling conditions for peacebuilding and effective governance in Jirapa. This can be achieved by integrating programmatic components that secure property rights, such as by mapping properties and addressing legal ambiguities on tenure rights, which can potentially prevent resource-related conflicts such as the ones between agricultural and pastoralist groups.

Likewise, the program is advised to integrate activities fostering an equitable distribution of resources and benefits, including through shaping more inclusive and transparent tenure governance policies and strengthening the links between formal and informal natural resource management systems. Nevertheless, the CSST results showed that for all other remaining climate-peace mechanisms, the CSV met and outscored ideal scores of conflict sensitivity and peace responsiveness, thereby featuring peace-contributing potential. The increased delivery of inputs, including fertilizers and improved seeds, climate-smart agricultural technologies, agricultural extension agents, as well as weather advisories have positively improved the production and incomes of farmers in Jirapa and increased their resilience by gaining better capacities to prevent losses during climate extremes.

These achievements embed conflict sensitivity co-benefits since they enabled the prevention and escalation of conflicts over resources by securing productivity




Image 2: CSST data collection process in Jirapa



Image 3: CSST validation workshop in Jirapa with local stakeholders.

levels through more resource-efficient strategies. Additionally, the CSV played a major role in increasing farmers' capacities through training and agrometeorological services. Throughout the cedi depreciation crisis, when fertilizers' costs increased exponentially, farmers in Jirapa used their intercropping knowledge acquired during trainings to collaboratively switch to less nitrogen-intensive crops to save money on inputs and managed to avert a crisis that greatly impacted neighboring villages. Strengthening capabilities is a key element for peacebuilding and human security, since it enables affected communities to utilize alternative methods and instruments to face, mitigate, and adapt to threats posed to human, environmental, and social rights. In a context where poverty leads many climate-vulnerable farmers - especially young ones - to trade their livelihoods with insecure and unsafe living conditions in illegal mining sites, the CSV - and climate action more broadly - is an important solution for addressing the drivers and root causes for conflict and fragility and create the enabling conditions for conflict prevention and peacebuilding.



The [Climate Security Sensitivity Tool \(CSST\)](#) is a programming tool designed to assess and guide climate adaptation interventions in conflict-prone areas by integrating climate and peacebuilding objectives. This tool helps practitioners evaluate and address the specific risks and vulnerabilities that climate change poses in fragile socio-ecological contexts. By analyzing key conflict drivers – including natural hazards (e.g., floods, droughts), human hazards (e.g., political instability), socioeconomic vulnerabilities (e.g., poverty), vulnerable groups (e.g., displaced populations), low institutional capacity, and infrastructural limitations – the CSST enables users to prioritize strategic programmatic areas for reducing conflict potential: climate-peace mechanisms. Using location-specific data, the CSST generates risk levels for each conflict driver and recommends targeted climate-peace mechanisms based on the risks. These mechanisms encompass economic development, institution building, trust and cooperation, resource sustainability, knowledge enhancement, and resilience-building. Through this method, the CSST ensures that climate adaptation efforts do not inadvertently intensify existing risks and tensions, such as competition over resources or social inequalities. Instead, it promotes a comprehensive, peace-responsive adaptation strategy that addresses both environmental challenges and conflict risks, supporting sustainable and resilient communities in fragile regions. The CSST has been validated in the field in [Ghana](#) and [Mali](#), and has been deployed on interventions led by WFP in [Niger](#) and [Burkina Faso](#), by Mercy Corps in the [Horn of Africa](#), and World Bank-funded Gulf of Guinea Northern Regions Social Cohesion ([SOCO](#)) [Project](#).

SECTION 3:

PRACTICAL CONSIDERATIONS FOR DESIGNING CLIMATE-SMART AGRICULTURE PRACTICES THAT YIELD PEACEBUILDING OUTCOMES

It is widely established that under certain circumstances the climate crisis can exacerbate socioeconomic and political drivers of insecurity and conflict, such as increased competition over resources, livelihood loss, and volatility of local food prices and provision (Nguyen et al., 2023). Agricultural interventions and development initiatives neglecting these associations risk intensifying such drivers and lead to maladaptation and unintended consequences, such as fostering power asymmetries, grievances, groups marginalization and conflicts over natural resources, especially in fragile and conflict-affected contexts (Attoh et al. 2023). These are commonly recognized drivers of conflict which must be accounted for while designing programs to avoid creating or exacerbating conflicts. Maladaptation is the process whereby improperly built adaptation strategies can result in negative impacts on the vulnerability of other systems, sectors, or social groups. Nevertheless, agricultural climate adaptation efforts have the potential to exert positive impacts on peace and security since shared environmental challenges can become opportunities for cooperation, integration and peace through transforming natural resource management strategies. Acknowledging the interlinkages between climate action, natural resource use and peace and security is fundamental to integrating climate and conflict-sensitive programming interventions and preventing maladaptation. Averting maladaptation requires context-sensitive interventions that provide practices and services tailored to specific local needs, maximizing peace co-benefits and minimizing the risk of exacerbating conflicts and grievances.

In achieving this, the following are 5 key components for a conflict-sensitive and peace-responsive climate adaptation to take into consideration when designing climate smart agriculture interventions:

01:

Conduct a contextual risk assessment which includes ecosystem analyses; climate impact assessment which focuses on ecosystem impacts, socio-economic and livelihood impact assessment, and conflict analysis to understand the underlying grievances, vulnerabilities, and conflict drivers. These different layers of analyses would allow practitioners to unpack issues around resource availability and access, the extent to which climate-related impacts affect valuable resources, such as water, pasture, livestock, and fishery, as well as the capacity of state, governance, and local resource and conflict management mechanisms in dealing with and adapting to these changing dynamics, among other critical issues.

02:

Conduct a local stakeholder mapping to have a solid understanding of the diverse array of actors that operate at the local level. This could include community leaders, sheikhs and tribal leaders, faith leaders, youth leaders, women groups, farmer cooperatives, municipalities and local governance mechanisms, peace committees, local media channels, schools, community centers, and social spaces. **These actors possess distinct interests, priorities, and perceived needs, have access to different constituencies, and have distinct capabilities and resilience tools at their disposal.** Based on this mapping, practitioners can have a nuanced understanding on whom to engage with and how to effectively leverage the distinct position of local actors to employ inclusive, locally-led, and conflict-sensitive agriculture programming. Additionally, this ensures that program design doesn't ignore structural and cultural realities on the ground and takes into account people's experiences, perceptions and values (Medina et al., 2023)

03:

Employ programming tools assessing climate risks and vulnerabilities in fragile, conflict-prone contexts are invaluable for setting effective programmatic priorities. These tools analyze risk factors – such as natural and human hazards, socioeconomic vulnerabilities, vulnerable groups, and weak institutional and infrastructural capacities – to guide climate adaptation efforts that reduce the chances of exacerbating existing tensions. In areas where resource competition, social inequalities, and historical grievances drive instability, such tools help **identify strategic intervention areas that not only foster resilience but also address the roots of conflict.** By defining priority actions that integrate sustainable resource management, economic empowerment, and institutional support, these tools ensure that climate adaptation does not inadvertently fuel further conflict. Instead, they enable tailored, peace-supportive responses that reinforce stability and promote long-term resilience and cooperation in complex socio-ecological environments.

04:

Continued dialogue and engagement with grassroots leadership and community members are critical for facilitating local ownership, enabling long-term sustainability, and achieving optimal programmatic results. This participation provides a platform that facilitates continued dialogues between diverse stakeholders, manages expectations, creates feedback avenues, and ensures effectiveness and agility across the programmatic phases, including the design, planning, implementation, monitoring, evaluation, and learning. In addition to this, it provides a platform for trust-building, transparency, and accountability, which are crucial elements for livelihood restoration in contexts of heightened clashes or protracted crises.

Likewise, the lack of or the ineffectiveness of resource-sharing mechanisms and governance structures is a common structural factor that weakens the adaptive capacity of affected groups and heightens the risk of conflict. Against this, it could be **useful to create a local advisory committee that brings together relevant community members and grassroots leaders**. However, this requires overcoming barriers to participation and ensuring that these groups are meaningfully involved in dialogue.

05:

Embed agility, sustainability, and scalability across the programmatic cycle.

Interventions related to climate-smart agriculture, natural resource management, and livelihood-building and restoration are key entry points for addressing root causes of conflict, bolstering social cohesion and communal trust-building as well as creating income-generating opportunities and bringing socio-economic benefits that allow for alleviating poverty and enhancing living conditions. This creates enabling conditions for peacebuilding and long-term sustainable development. In achieving this, it is important to engage with relevant stakeholders around the enablers of sustainability, the possible programmatic limitations, risks, threats, and means for addressing or adapting to them, as well as the potential for project replication and upscaling. Indeed, direct and continued involvement with local stakeholders would facilitate the inclusion of these key elements into the programmatic design.



Credit: Mavis Amedegbe

SECTION 4:

UPCOMING APPROACHES FOR INSTRUMENTALIZING CLIMATE ADAPTATION FOR CONFLICT PREVENTION AND SUSTAINING PEACE: CLIMATE SMART VILLAGES PLUS (CSV+)

Building on over a decade of success of the CSVs, the CSV+ approach aims to scale out and up the CSV approach by aligning climate adaptation and mitigation, social cohesion, and trust building in displacement, fragile, and conflict-affected settings. The goal of the CSV+ approach is to develop a peace-positive, resilient community that can effectively adapt to climate change impacts while fostering social cohesion and human security.

The intersection of CSVs with human security is of paramount importance, as climate change has far-reaching implications for socio-economic stability and the potential to exacerbate existing tensions over natural resources. The participatory and inclusive approach of CSVs makes them an ideal vehicle to embed elements of conflict sensitivity and peace responsiveness in climate action. CSVs can be used to promote positive peace and reduce structural violence by fostering inclusive, equitable, and sustainable development within communities. Moreover, CSVs can improve cooperation on natural resource management and address the root causes of communal conflict and insecurity. Finally, by ensuring that marginalized groups, including women, youth, and ethnic minorities, have access to resources, technologies, and decision-making processes, CSVs can help dismantle the systemic barriers that perpetuate social inequalities and exclusion in climate action.

Following the CSV model, the CSV+ approach will combine state-of-the-art land, water, and food systems science and innovations with a participatory co-design process. In addition, it will co-define peace-positive climate adaptation and mitigation pathways that respond to local needs in a socially inclusive way. Building on a scientific research base, the researchers will work with local communities for a period of at least 5 years to a) assess vulnerabilities, exposure, and compound risks and explore and co-design the CSV+, and b) share knowledge and disseminate learning and c) test and assess the impact of the co-designed solution on the ground.

While the focus will be on livelihoods tied to food, land, and water systems, other aspects of village life, including energy, waste management, social equality, inclusion, and cohesion, infrastructure, and local governance will also play important roles. This process is inherently participatory and driven by local communities, potential solutions could entail: transformative changes in agricultural and water management practices to produce co-benefit for stability and peace; changes in natural resources access and management practices that can ease competition; climate-smart technology, information, and agro-advisory services that could strengthen rural livelihood and reduce the risk of forced migration; innovative approaches to address structural inequalities and vulnerabilities of

the most marginalized to reduce local tensions. These solutions will be part of an integrated, whole-of-community plan that seeks to foster deep-reaching village transformations. The focus is on the development of solutions that are locally driven and that can be replicated and upscaled by other local communities in the region through strategic partnerships with the NGOs, government, and the private sector.



Credit: Neil Palmer / CIAT

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