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Women's Empowerment and Conflict in Burkina Faso

Learning from a Randomized Trial and Non-random Conflict

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ABSTRACT

Armed conflict has myriad negative consequences on the wellbeing of women and men, and its non-random nature makes it difficult to study its impacts. We examine the changes in empowerment during the period of 2017-2020 in western Burkina Faso as armed conflict moved closer. We combined data from the randomized-controlled trial of Soutenir l'Exploitation Familiale pour Lancer l'Elevage des Volailles et Valoriser l'Economie Rural (SELEVER) a gender- and nutrition-sensitive poultry production intervention, which collected the project-level Women's Empowerment in Agriculture Index with geospatial- and date-specific data from the Armed Conflict Location and Event Data project database. To evaluate the effect of conflict on empowerment, we estimated a continuous difference-in-difference model, separately for women and men, across multiple empowerment indicators, in which the primary explanatory variable describes the change in distance to conflict during this time period. Then, to determine if the SELEVER program had a protective effect when there was increased proximity to conflict, we estimated these models separately for the treatment and control groups and compare the difference in the coefficients. As conflict encroached, there was a shift in intrahousehold decision making that suggests less coordination between spouses and fewer decisions made jointly, along with a greater acceptance of intimate partner violence among women. We also found increases in other outcomes, such as men's group membership, and women's and men's access to credit. These changes may be attributable to how communities responded and how humanitarian aid was delivered. We found that the SELEVER program had a protective effect on men's work balance and the amount of time that both women and men spent working. Notably, however, women spent more time on childcare activities as conflict become closer.

Keywords: Gender, women's empowerment, Insecurity, Conflict, Burkina Faso

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ACRONYMS

ACLED	Armed Conflict Location and Event Data
BCC	Behavior change communication
CLTS	Community-led total sanitation
NGOs	Non-governmental organizations
IPV	Intimate partner violence
JNIM	*Jama'at Nusrat al Islam wal Muslimeen*
pro-WEAI	Project-level Women's Empowerment in Agriculture Index
SELEVER	Soutenir l'Exploitation Familiale pour Lancer l'Elevage des Volailles et Valoriser l'Economie Rural
VDP	Volunteer for Defense of Homeland
WASH	Water, Sanitation, and Hygiene

INTRODUCTION

Multiple studies have examined the consequences of armed conflict on women's wellbeing due to the heightened risks to women specifically in terms of sexual violence (Nordås and Cohen 2021), intimate partner violence (IPV) (Ekhator-Mobayode et al. 2021; Müller and Tranchant 2019), or through the more general costs of conflict (Gates et al. 2012). A related body of literature has also focused on women's roles in the resolution of armed conflict, demonstrating, for example, that women's status has an effect on post-conflict reconstruction (Gizelis 2011) and that having more women in national legislatures prolongs peace (Shair-Rosenfield and Wood 2017).

Considering other areas of women's lives, there is considerably less evidence on how armed conflict affects women's empowerment—the ability to pursue strategic life goals (Kabeer 1999). Existing studies, which we detail below, either operationalize women's empowerment as a single broad construct or only consider specific sub-components. The multidimensional nature of women's empowerment means that conflict may have differential effects across domains. At the same time, there is evidence that this relationship may not be unidirectional, as places more exposed to conflict exhibit lower levels of women's empowerment (Bakken and Buhaug 2021). This is a valuable area of study considering that armed conflict and perceived risk of armed conflict may differentially affect domains of empowerment. Women's empowerment has important intrinsic value and is also critical for supporting other development goals, such as the health and nutrition of women and children and agricultural diversity (Connors et al. 2023; Grown, Gupta, and Pande 2005; Heckert, Olney, and Ruel 2019).

In this paper we examine whether increased proximity to armed conflict in Burkina Faso effects different domains of empowerment and whether the Soutenir l'Exploitation Familiale pour Lancer l'Elevage des Volailles et Valoriser l'Economie Rural (SELEVER) program, a gender- and nutrition-sensitive poultry value chain intervention, helped mitigate some of the potentially negative consequences of armed conflict on women's empowerment. We use data from the SELEVER randomized controlled trial, which collected data on women's empowerment using the project-level Women's Empowerment in Agriculture Index (pro-WEAI) (Malapit et al. 2019) and took place from 2017 to 2020 when episodes of violence and insecurity, including spill-overs from armed conflict in Mali, began to occur more frequently and closely. We combine the SELEVER data with the Armed Conflict Location and Event Data (ACLED) project database, which has geospatial- and date-specific data on event occurrence.

Overall, we found that, as distance to conflict decreased, women had less input into productive and spending decisions, along with greater acceptance of intimate partner violence, suggesting changes in intrahousehold dynamics. There were also other changes, likely attributable to how communities and humanitarian assistance responded to the conflict and insecurity, including increased group membership

among men and increased access to credit among women and men. The SELEVER program also had a protective effect on men's work balance and the amount of time that both women and men spent working. This paper joins a relatively small body of research focused on women's empowerment and conflict and contributes to an understanding of the factors that affect specific domains of women's empowerment.

Background

Women's empowerment is multi-dimensional and encompasses instrumental, intrinsic, and collective agency (Malapit et al. 2019; Rowlands 1998). Exposure to and the perceived risk of armed conflict have the potential to affect different domains of women's empowerment through several potential mechanisms. Safety concerns may limit where women can go and whether they can allocate their time to specific activities. The structure of the household may change, either due to death, or because individuals (more often men) may leave home to either fight or avoid recruitment or conscription (Justino et al. 2012). Conflict may increase general stress on households, such that it alters intrahousehold gender dynamics. Conflict may also disrupt social institutions in ways that alter gender norms, changing what may be perceived as appropriate for women and men to do.

One way that conflict and insecurity may disempower individuals is by limiting their freedom of movement. In many areas of the world, and specifically in the Sahel, women's freedom of movement is already limited, often with the motivation of protecting women from danger or limiting their interactions with non-family men (Eissler et al. 2020; Heckert, Myers, and Malapit 2020). Further limitations on freedom of movement may disempower women and men in other domains, such as by limiting their ability to participate in income generating activities, especially when these activities require them to travel away from home. These concerns may be compounded for women, as was the case in Myanmar; where although men were able to travel for work and education, women became increasingly isolated (Ma and Kusakabe 2015).

Several studies examine links between armed conflict and different facets of intrahousehold decision making as well as spending and control over income. During periods of conflict, there are multiple factors at play that could lead to increases or decreases in women's empowerment across different types of intrahousehold decisions. If men are forced to focus their attention on protective or offensive roles away from home, women may be left with increased leeway over intrahousehold decisions. At the same time, the increased stress of conflict may encourage men to control more household decisions. The absence of men and economic stresses during conflict may encourage women to take on new income generating activities, but limited freedom of movement may disrupt trade over longer distances and economic activities in general.

Indeed, empirical evidence finds complex relationships between conflict and intrahousehold decisions that vary across context. A cross-country analysis of 51 countries over three decades found that, on average, armed conflict was associated with a decline in women's input in decisions, a pattern driven by control over income (Le and Nguyen 2023). A study from Rwanda looked specifically at the shift in marriages that occurred before and after the genocide and also found reduced input in decisions among women and attributed this change to the decreased availability of marriageable men among cohorts who married following the genocide (La Mattina 2017).

A recent study in Mali found that in more conflict affected areas women experienced increased input in household decisions, attributable to the absence of men, but at the same time had less input into how their own earnings were spent, suggested that these funds may still be channeled to men or non-household members (Ekhator-Mobayode et al. 2021). A study in Colombia found that among conflict displaced households, despite increased women's labor force participation, their input in household decisions did not increase, attributable to the stress caused by exposure to violence (Calderón, Gafaro, and Ibáñez 2011).

Conflict may also affect how women and men use their time, largely by creating inefficiencies and excess workloads. A cross-country study found that men's absence leads to increased workload among women during times of conflict (Justino et al. 2012). Even when men are not absent, conflict and insecurity may lead women to increase the number of hours they are working away from home, but without a redistribution of domestic labor tasks, as was found in studies from both Uganda (Tino 2017) and the Middle East (Anderson and Myrttinen 2017). Additionally, conflict may lead women to work longer hours for lower wages, as was found in Colombia (Calderón et al. 2011).

Few studies have examined the relationship between conflict and areas of intrinsic agency, such as self-efficacy. There are studies, however, that examine how livelihood strengthening strategies in conflict and post-conflict settings can help individuals become more self-reliant and increase their self-efficacy. One study in Gaza, for example, found that participating in a microfinance program helped individuals rely less on aid and more on income they generated (Hammad and Tribe 2020). Additionally, an analysis of 23 sub-Saharan African countries found that women exposed to conflict before the age of 20 more often viewed IPV as acceptable or were? less able to claim their rights to freedom from violence (an aspect of intrinsic agency) (La Mattina and Shemyakina 2024).

Collective agency, or harnessing the power of formal and informal groups, may also be affected by conflict. On one hand, it may be unsafe to travel to group meetings, or policies stemming from conflict responses may limit the ability to congregate in groups and, thus, gain collective agency from group activities. There were, in fact, limitations on most types of group gatherings in Burkina Faso when this study took place. At the same time, groups focused on community protection may form or become more

active or powerful in response to conflict. Collective agency can also be thought of in a more macro sense in terms of political action and participation. In response to conflict generally, and specifically to the absence of men during conflict periods, women may have an increased voice within community groups and political processes. As one example, the Maoist movement in Nepal led to increased political participation of women and eventually more women in elected offices (Yadav 2021). Women's political participation may serve to support the well-being or promote the safety of women during periods of conflict, as highlighted in evidence from Colombia (Kreft 2018). Cross-national analyses have found that over the short and medium term, conflict is associated with an increase in women's empowerment as measured by their political participation (Webster, Chen, and Beardsley 2019). Additionally, Bakken and Buhaug (2021) found that women's empowerment improved in countries following periods of high-intensity civil conflicts and attributes this change to women's involvement in peace deals.

METHODS

Study context

The SELEVER study took place in Centre Ouest, Hauts-Bassins, and Boucle de Mouhoun regions of Burkina Faso. Burkina Faso consistently ranks among the poorest 10 countries in the world according to the Human Development Index (United Nations Development Programme 2021). Burkinabe women marry early—median age at first marriage is 18.9 years—and receive little formal education—58.3% of women never attended school and only 30.4% are literate (Institut National de la Statistique et de la Démographie and the DHS Program 2023). In comparing women's empowerment across multiple countries, the pro-WEAI found that levels of women's empowerment in the SELEVER study sample are low, even compared to other low-income countries (Heckert et al. 2023; Quisumbing et al. 2024).

Women in the study area engage in a variety of economic activities. They typically contribute labor for the farming of staple crops alongside their husbands and may be allocated an area of land for their own farming or maintain a kitchen garden near the home (Eissler et al. 2020). Women commonly play a key role in poultry production, but have less access to veterinary and extension services and limited freedom of movement, meaning husbands and sons typically take poultry to market and engage with traders (Gelli et al. 2017).

Long considered an "island of stability" in the Sahel (Haavik, Bøås, and Iocchi 2022), Burkina Faso is now at the epicenter of the armed conflict that affects the central Sahel region. The evolution of violence over recent years has been striking. According to ACLED, the country went from experiencing virtually no violent events before 2015 to 1,045 in the year 2023 alone. Burkina Faso is now home to over two million internally displaced people (United Nations Office for the Coordination of Humanitarian Affairs 2023), and 6.3 million people are in need of humanitarian assistance (United Nations Office for the Coordination of Humanitarian Affairs 2024). The main actors of the conflict are militant Islamist groups, notably the JNIM (*Jama'at Nusrat al Islam wal Muslimeen*), *Ansaroul Islam*, Islamic State in the Greater Sahara and Islamic State in the West African Province; self-defense groups and militias, banditry groups; and state security forces. The multiplication of the self-defense groups and militias is a direct response to the growing violence in the rural areas, and, in turn, their growing importance largely explains the establishment of a "conflict system" whereby violent actors respond to each other and "create the conditions of their reproduction" (Quidelleur 2022).

Program, study description, and data

Program design

Details of the SELEVER intervention are published elsewhere (Gelli et al. 2017). Briefly, the intervention was implemented by non-governmental organizations (NGOs) led by Tanager, including three main components: 1) Poultry production and marketing systems; 2) Nutrition and gender; and 3) Poultry production with water, sanitation, and hygiene (WASH). The first component involved support to poultry production and marketing based on improved access to financing, vaccination, and trainings. The second component integrated nutrition behavior change communication (BCC) with gender sensitization, implemented through trainings, peer group support, and home visits. Nutrition BCC included materials and training on nutritious diets and IYCF delivered through poultry producer and women's groups and community leaders. Gender sensitization activities included support for women's groups and promotion of gender equity and women's empowerment. The third component aimed to enhance impacts on nutrition outcomes by reducing exposure of young child to poultry feces through a Community-Led Total Sanitation (CLTS) (Crocker et al. 2017) approach adapted with materials to reduce children's exposure to poultry feces, which was delivered via trained CLTS facilitators and village hygiene committees.

Hypotheses

In the background, we identified four specific mechanisms linking conflict exposure and changes in women's empowerment: safety concerns that limit when and where women spend their time, changes in household structures, increases in household stress (emotional and financial), and disruptions to social institutions that drive gender norms, potentially leading to loosening of restrictive gender norms. All these mechanisms are relevant for our study context, though changes in household structure and disruption to social norms to a lesser extent.

In the study context we hypothesized that among the pro-WEAI indicators, increased proximity to conflict would lead to declines in input in livelihood decisions, control over use of income, access to and decisions on credit, and work balance. We expected to see declines in input in livelihood decisions and control over use of income stemming from both reduced mobility limiting livelihood opportunities, as well as due to household stress triggering men to enact control. We also expected to see a decline in access to and decisions on credit based on the need for formal financial institutions to limit their operations and for village savings and loan groups to avoid meeting due to laws limiting gatherings. Finally, we expected to see work balance deteriorate if women are forced to provide more in the absence of men.

Additionally, we hypothesized that living in a SELEVER treatment village during this period of increased insecurity would mitigate some of the negative effects of conflict on women's empowerment. The SELEVER intervention aimed to support improvements across all of these areas of women's empowerment, but the impact assessment found no effects on these outcomes (Heckert et al. 2023). Nevertheless, it is possible that the program had a meaningful effect in these more vulnerable areas. Alternatively, conflict may have reduced program exposure, attenuating program impacts.

For completeness, we include the other six pro-WEAI indicators as secondary outcomes for both questions: ownership of land and other assets, attitudes about domestic violence, self-efficacy, autonomy in income, visiting important locations, and group membership. We, however, do not have specific hypotheses about whether exposure to conflict will lead to an increase or decrease in these six empowerment outcomes. To better understand the gendered experiences of empowerment during conflict, we also examine both the primary and secondary outcomes for men.

Study design

The study protocol and design of SELEVER have been published elsewhere (Gelli et al., 2017). Briefly, it was a cluster-randomized controlled trial implemented in 120 villages within 60 communes (districts). Communities were randomly assigned using a two-stage procedure to one of three arms: SELEVER, SELEVER+WASH, and a control group with no intervention. SELEVER activities were implemented at the commune level. During a preparatory phase, 60 communes were selected from a list of 79 communes in the targeted regions. Criteria for commune selection included: 1) not part of the SELEVER pilot communes; 2) classified as rural or peri-urban in the latest national census; 3) year-round road accessibility; and 4) for communes in Hauts-Bassins region, proximity to Boucle de Mouhoun and Centre Ouest regions. To maximize balance, the first stage randomization allocated 60 communes into two groups (SELEVER and control) using a restricted randomization procedure that modelled selection using commune- and village-level variables from the national census, including population size, existence of a government center, number of female associations, main agricultural crop, main revenue source, market access, health center presence, number of functional boreholes and functional wells. The procedure was developed using Stata to randomly allocate communes to two groups, stratifying by region, and select two villages in each commune for inclusion in the study. Villages too small to allow for a survey sample to be drawn (less than 15 households with children in the two-to-four-year age group) or too large to be considered rural (population over 5000 people, or over the 95th percentile of the population distribution) were excluded. The algorithm regressed selection into the treatment group based on the village- and commune-level variables over 3,000 allocations and selected the permutation that minimized the r^2 statistic for the predicted selection.

Data collection

Baseline and endline surveys

Baseline data were collected in March 2017 (post-harvest season) from 1800 households (15 households per village, 120 villages). Endline data collection began in March 2020, was interrupted due to the COVID19 pandemic, and resumed in August 2020, near the end of the agricultural slack season. At both endline and baseline, each household was administered a household questionnaire focused on household characteristics and economic activities. Individual surveys, which included the pro-WEAI, along with a wide variety of other outcomes were administered to one woman and one man in each household. In households with multiple women, the woman primarily responsible for poultry activities was selected. Attrition across the survey waves was minimal and has been described previously (Becquey et al. 2022; Leight et al. 2022).

Ethical approval for the SELEVER study was provided by the Institutional Research Board at the International Food Policy Research Institute (IRB00007490) and the Comité Éthique pour la Recherche en Santé MS/MRSI in Burkina Faso (2016-12-142).

Measures of women's empowerment

SELEVER was part of the Gender Assets and Agriculture Project, Phase 2 (GAAP2), which was used to pilot and develop the pro-WEAI (Malapit et al. 2019; Quisumbing et al. 2024). We used the 10-indicator version of pro-WEAI (Seymour et al. 2023), which includes three indicators of intrinsic agency (autonomy in income, self-efficacy, and rejection of IPV); six indicators of instrumental agency (input in productive decisions, ownership of land and other assets, access to and decisions on financial services, control over use of income, work balance, and visiting important locations); and one indicator of collective agency (group membership). A respondent is considered empowered in each indicator if they have reached a certain threshold based on cutoffs established in Malapit et al. (2019). We also considered count versions for nine of these ten indicators (not possible for autonomy in income), based on definitions used in previous work (Heckert et al. 2023). The women's empowerment variables are described in Table 1.

Table 1. Definitions of empowerment variables and baseline means

Variable	Definition	Women Mean	N	Men Mean	N
Binary version of pro-WEAI indicators (Mean in %)					
Intrinsic agency					
Autonomy in income	More motivated by own values than by coercion or fear of others' disapproval; Relative Autonomy Index>=1	57.33	1657	67.88	1454
Self-efficacy	Agree or greater on average with self-efficacy questions in the New General Self-Efficacy Scale	44.53	1657	61.00	1454
Rejection of intimate partner violence	Believes husband is not justified in hitting or beating wife in all five scenarios: she goes without	54.37	1657	68.71	1454

Variable	Definition	Women Mean	N	Men Mean	N
	telling him; she neglects the children; she argues with him; she refuses to have sex with him; she burns the food				
Instrumental agency					
Input in productive decisions	Makes decision solely, makes decision jointly and has at least some in input in the decisions, or feels could make decision for all agricultural activities they participate in	79.91	1658	95.53	1454
Ownership of land and other assets	Solely or jointly owns at least three assets or land	83.53	1658	99.17	1454
Access to and decisions on financial services	Meets one of the following conditions: belongs to a household that used a source of credit in the past year and participated in at least one decision about it; belongs to a household that did not use credit but could have if wanted to; has sole or joint access to a financial account	20.14	1658	42.02	1454
Control over use of income	Has input in decisions related to how to use both income and output from all agricultural activities they participate in and has in put in decisions related to income from all non-agricultural activities they participate in	67.09	1658	86.86	1454
Work balance	Workload less than 10.5 hours per day, where workload=time spent on primary activities + (1/2)*time spend on childcare as a secondary activity	30.57	1449	74.90	1263
Visiting important locations	Visits at least two locations of city, market, family/relative's house at least once per week, or visits health facility or public meeting at least once per month	52.53	1658	73.24	1454
Collective agency					
Group membership	Active member of at least one community group	34.20	1658	43.60	1454
Count versions of pro-WEAI indicators					
New General Self-Efficacy Scale	Score on the New General Self-Efficacy Scale	28.14	1657	30.05	1454
Number of violence situations	Number of scenarios in which believes husband is not justified in hitting or beating wife: she goes without telling him; she neglects the children; she argues with him; she refuses to have sex with him; she burns the food	3.59	1657	4.21	1454
Number of production decisions	Number of agricultural activities for which makes decision solely, makes decision jointly and has at least some in input in the decisions, or feels could make decision	6.34	1658	14.48	1454
Number of assets owned	Number of assets they own solely or jointly	6.91	1658	7.37	1454
Number of credit sources	Number of sources of credit they participated in decisions about	0.22	1658	0.52	1454
Number of income decisions	Number of activities for which has input in decisions related to income and outputs	0.12	1658	0.31	1454
Hours spent on work	Number of hours spent on work	6.68	1449	5.01	1263
Number of visit locations	Number of locations respondent visits once per week (city, market, family/relative) or once per month (health facility, public meeting)	1.52	1658	2.24	1455
Number of groups	Number of community groups they are an active member of	0.47	1658	0.62	1454

Source: The authors, based on Malapit et al. 2019 and Heckert et al. 2023.

Measures of conflict exposure

To assess exposure to conflict we use both spatiotemporal data on violent events derived from the ACLED database, as well as subjective indicators of insecurity, which were collected in the SELEVER surveys to provide a multifaceted understanding of conflict exposure.

The ACLED database includes the timing and georeferenced location of armed confrontations, attacks, raids, or other forms of violence. These incidents are sourced from local authorities, security agencies, and independent monitoring organizations. The indicators are described in Table 2.

Table 2. Summary of distance to conflict by type of conflict and year

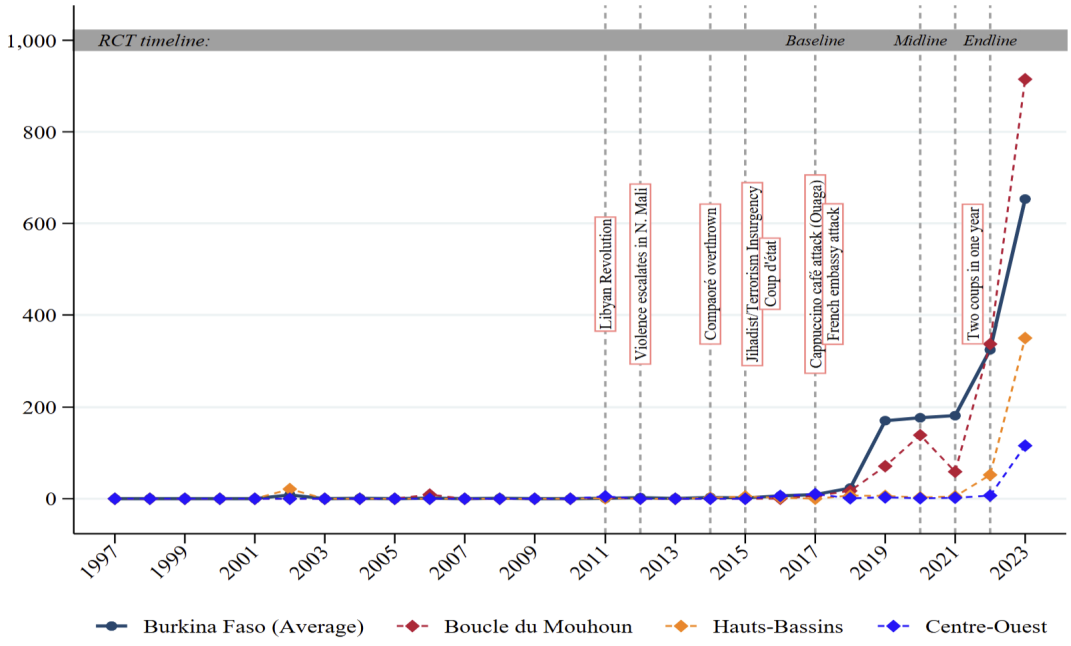
	Min	Max	Mean	Median	SD	Description[1]
Any conflict	0.05	30.57	10.49	10.05	7.27	Any of the following types of conflict
Type of conflict, any year						
Battles	0.16	46.16	19.27	19.03	11.74	A violent conflict between two organized armed groups. These groups are characterized by their ability to inflict harm through armed force at close range and are typically cohesive, operating around a shared agenda or political purpose. They often have a specific identity, name, and stated objectives. For example, conflicts between JNIM and the Police Forces of Burkina Faso fall into this type of conflict.
Riots	0.24	48.92	23.86	23.10	12.13	Violent events involving demonstrations or mobs of three or more people engaging in destructive acts, such as physical fights, rock throwing, or property damage. These actions may target individuals, property, businesses, other rioting groups, or armed actors. In Burkina Faso, these events usually involve only civilians or Volunteers for the Defense of the Homeland.
Protests	0.67	51.33	26.70	27.03	12.49	Defined as an in-person public demonstration of three or more participants in which the participants do not engage in violence, though violence may be used against them.
Violence against civilians	0.05	40.73	17.87	18.05	10.64	Violent events where an organized armed group targets unarmed civilians, who are unable to engage in political violence. This asymmetric violence involves perpetrators such as state forces, rebels, militias, and external actors, who are the only parties capable of using force in the event. Example: The attack of the Cafe Cappuccino in Ouagadougou, in 2017.
Explosions	0.98	80.50	32.55	30.26	18.35	"Explosions/Remote violence" events include incidents where one side uses long-range, widely destructive weapons, such as explosives, to inflict harm.
Any conflict by year						
2017	5.41	85.44	43.86	41.43	19.38	
2018	0.68	65.03	31.46	30.11	15.20	
2019	5.41	59.95	29.30	28.11	11.94	
2020	0.18	74.79	33.42	30.97	15.43	
2017 to 2020	**0.18**	**42.36**	***21.07***	***21.60***	***10.37***	

Source: The authors' calculations.
Note: Distance is measured in kilometers.
[1] Description derived from the ACLED codebook.

We combine the georeferenced ACLED data with villages' geographic information systems (GIS) coordinates. We then compute the distances between each village and each conflict hotspot during the 2017 to 2020 period. The data included conflict hotspots reported in the three Sahelian countries (Burkina Faso, Mali, and Niger), to account for nearby events that occurred beyond national borders. Our baseline conflict indicator considers events that occurred from January 2016 to March 2017, when the SELEVER baseline started. The endline conflict indicator covers January 2019 to May 2020.

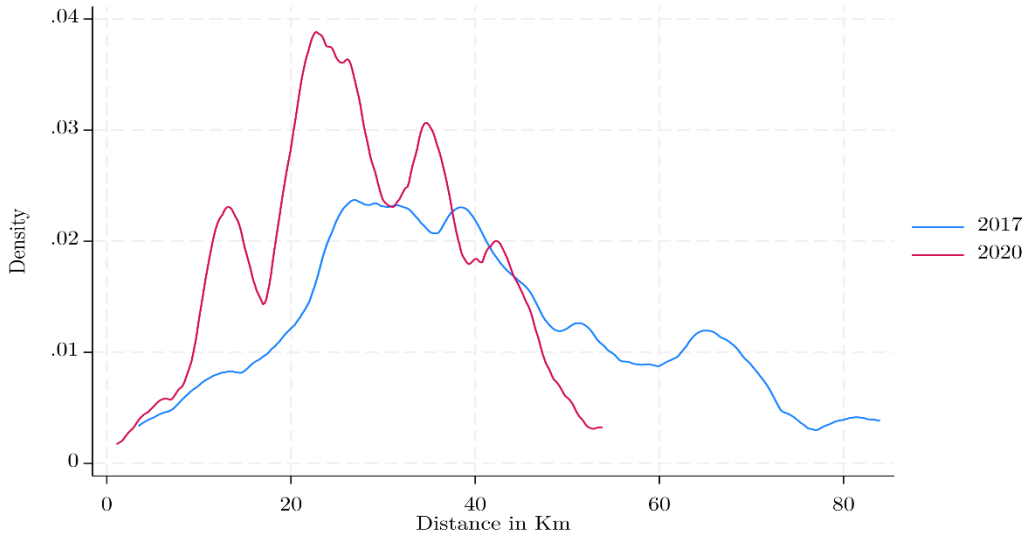
Figure 1 uses these ACLED data to quantify the increased exposure to conflict in the region, from 1997 to 2019, for Burkina Faso as a whole, as well as for the three administrative regions where the study took place. Across Burkina Faso, we see an increased frequency conflict-related events beginning in 2011 and aligning with other outbreaks of conflict in the region. The frequency of these events increased dramatically beginning around 2017 with another large increase around 2019. The three administrative regions where the study took place were relatively isolated from conflict-related events within their borders until around 2019. At the same time, conflict was escalating nearby, and Figure 2 shows the change in distance to conflict at the village level between 2017 and 2020. Notably, conflict moved closer to the study villages.

Figure 1. Number of conflict-related events reported across years (data from ACLED)



Source: The authors' calculations based on ACLED data.

Figure 2. Change in village distance to conflict between 2017 and 2020



Source: The authors' calculations based on ACLED data.

Additionally, in the endline survey we asked one primary respondent about their perceptions of the conflict, specifically aspects of their mobility that may have been affected by the conflict. We construct subjective indicators of villagers' perceptions of conflict, measured by mobility restrictions. This dimension captures the subjective experience of conflict as reported by the villagers themselves. From the SELEVER surveys, it is proxied by restrictions on their movement, which are often a direct consequence of conflict-related threats or insecurity. These mobility restrictions can manifest in several ways, such as limitations on travel due to the presence of armed groups, roadblocks, curfews, or general fear of violence. The extent to which villagers experience these restrictions serves as an important indicator of their perceived exposure to conflict and the broader insecurity affecting their daily lives.

Analytic approach

Time trend with fixed-effects

We begin with a naïve analysis that examines the correlation between distance to conflict and the outcome, which are defined as the pro-WEAI component indicators, using fixed effects at the village and household level. This estimate is specified as,

$$Y_{ivt} = \tau_t + \alpha_v + \beta \text{Dist}_{vt} + \delta SELEVER_v \times Post + \lambda Controls + \epsilon_{ivt}$$

where Y_{ivt} is the outcome for individual i in village v at time t; τ_t are time fixed effects; α_v are village fixed effects; $\text{Dist}_{vt} \equiv -\text{distance}_{vt}$ is the negative of the distance from village v at time t to the nearest conflict event (so larger $Dist_{vt}$ means closer proximity); $SELEVER_v$ represents a dummy equal to 1 if the village was assigned to receive the SELEVER treatment; and *Post is* a dummy variable for endline. Additionally,

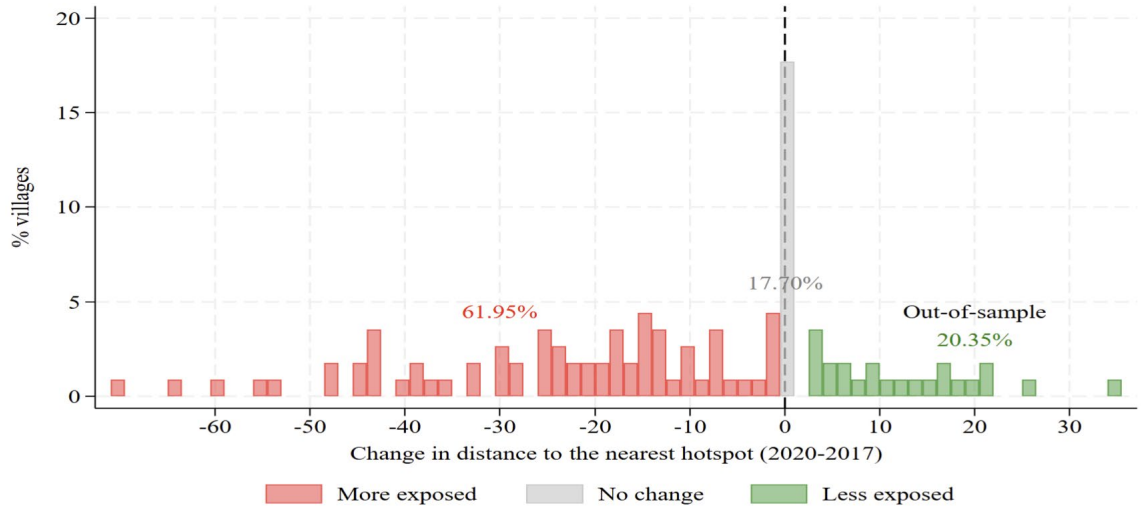
we control for the number of conflict events and conflict-related fatalities at period *t*. The coefficient β thus captures the correlation between proximity to conflict and the outcome.

We prefer this approach to a single-difference model, because 6% of households are only observed at one of two waves. Additionally, the panel is not defined at the respondent level, and the survey design does not allow us to identify wither certainty whether the same individuals within households were interviewed at baseline and endline, though in most cases they were. First-differencing at the individual level is therefore infeasible, and at the household level it would require dropping these singletons, reducing both sample size and precision. By contrast, including village fixed effects allows us to retain households observed in only one wave while controlling for time-invariant village characteristics. This approach is particularly appropriate in our context, as households within the same village are relatively similar, whereas conflict exposure varies sharply across villages and is systematically correlated with village-level characteristics. As a robustness check, we also estimated models with household fixed effects on the balanced subset. Estimates are very similar both in magnitude and significance to the village-FE results, leading to the same substantive conclusions. These results can be found in the appendix.

Impact of conflict on empowerment—Continuous difference-in-differences models

To evaluate changes in empowerment as distance to conflict decreases in proximity to our study villages, we estimate continuous difference-in-differences models (Chaisemartin et al. 2025), separately for women and men across the ten pro-WEAI component indicators, relying on distance to conflict to measure exposure. We first characterize our control group through Figure 3, which shows the distribution of the change in distance to the closest conflict hotspot at the village level between 2017 and 2020. Figure 3 shows the share of villages that distance to conflict decreases, on the left in red (so-called switchers-in); become farther from conflict, on the right in green (so-called switchers-out, green); and remain the same distance from conflict, at the middle in gray. For our primary analysis, we compare the villages that were more exposed (red) to the ones where there was no change (gray). Importantly, we exclude those that become farther from conflict, because we would not expect an equivalent negative effect of comparable magnitude for becoming farther from conflict. As shown in Figure 3, our sample includes a substantial share of stayers (18% of villages, or 21 villages comprised of 315 households and 630 respondents) whose distance to the nearest conflict hotspot remained unchanged between the baseline and endline. The presence of both stayers and switchers enables us to implement a continuous difference-in-differences design following de Chaisemartin et al. (2025)

Figure 3. Distribution of villages by change in conflict exposure



Note: This figure summarizes the change in conflict exposure across villages in the sample. For each village, we compute the difference in distance to the nearest conflict event between 2020 and 2017, where distance at each date is calculated from the village centroid to the closest ACLED-reported violent event the same year. Villages with negative differences (red) became relatively more exposed to conflict between 2017 and 2020, villages with no difference (gray) experienced no change, and villages with positive difference (green) became less exposed. The percentages displayed correspond to the share of villages in each of the three groups. The villages where distance to conflict increased (green) are not included in the following analyses.

In Chaisemartin et al. (2025), the authors propose two main parameters of interest: (i) the Average Slope (AS) of the treatment effect, which measures the effect on units' outcome of interest of changing their treatment from its period-one to its period-two value; (ii) the Weighted Average Slope (WAS) of the treatment effect, which is a weighted version of the AS, where the weights are the variation of the treatment exposure relative to the average variation. In our case, this parameter captures the effect of increased exposure to conflict and is measured as the average change in the outcome resulting from a one-unit decrease in distance to conflict

Chaisemartin et al. (2025) show that under a parallel-trends assumption (discussed further below), the slopes of switchers' potential outcomes are nonparametrically identified when using difference-in-differences comparisons between (i) switchers-out (further from conflict), and (ii) stayers (no change), conditional on having the same baseline level of exposure (baseline distance to conflict). Because we observe some quasi-stayers (villages whose exposure changed only marginally between 2017 and 2020), we follow the authors' recommendation and rely on the WAS in which villages' estimated slopes are weighted proportionally to their relative contributions to the average exposure change in the sample (i.e., the average of the first difference of the negative distance to conflict). This estimator is more robust to the presence of quasi-stayers than the unweighted version (the AS), and under some conditions it is asymptotically more efficient. Specifically, the parameter is defined as follows:

$$WAS \coloneqq E\left(\frac{|D_2-D_1|}{E(|D_2-D_1||S=1)} \times \frac{Y_2(D_2)-Y_2(D_1)}{D_2-D_1}\middle| S=1\right)$$

Where D_t is the distance of the village to the nearest conflict, at period t; $Y_t(D_t)$ is the potential outcome had the distance to the nearest conflict been located $D_t\ km$ away. To ease the interpretation in our analysis, we use the negative of the distance to conflict as the indicator of conflict exposure: the higher the inverse, the higher the exposure to conflict. Additionally, as a robustness check, we conduct a traditional difference-in-difference model, the details of which can be found in the appendix.

Threats to identification

Sample of interest

One of our core research questions is whether increased exposure to conflict affects empowerment. Conceptually, this requires focusing on villages that experienced an increase in conflict exposure (in our case, distance to conflict decreasing) between baseline and endline. Thus, our final sample includes (i) villages whose distance to the nearest conflict hotspot did not change between 2017 and 2020, within a margin of 5 kilometers and (ii) villages for which conflict events moved closer. In other words, we exclude villages that became relatively less exposed to conflict from 2017 to 2020. Note that this sample restriction is not applied for the time trend with fixed-effects model, in which our main interest is only descriptive correlations.

One could argue in favor of keeping these villages that switch out. For instance, in a difference-in-differences framework, one could try to consider decreased exposure to conflict as a "negative exposure shock" and estimate an average effect in which their contribution has a negative weight. However, such an approach is likely to induce bias, potentially understating the true effect. First, it is difficult to justify a symmetric effect of conflict exposure, where moving farther away would mechanically produce the opposite of moving closer. Second, the effects of conflict exposure may be long-lasting: even if villages became less exposed between 2017 and 2020, villagers may still suffer from the lingering psychological, economic, and social consequences of past conflict. Including these villages would therefore introduce substantial noise and lead to estimates that are harder to interpret. With this in mind, our sample only retains villages that meet condition (i) (17.70%) or (ii) (61.95%).

Parallel-trends assumption

It is also important to discuss the parallel-trends assumption and the corresponding potential outcomes specification. In this particular context, we are interested in the effects of conflict exposure on various outcomes, such as program participation and empowerment-related indicators, as a first-order question (in addition to assessing the protective effects of the program). However, potential outcomes cannot be

specified solely as a function of conflict exposure. One must also account for the ongoing program, particularly because the RCT arms are not equally exposed to conflict.

For ease of explanation, let $c_{v,t}$ denote the degree of conflict exposure for village v at time t (for instance, the negative of the distance to the nearest conflict hotspot, $-d_{v,t}$). Let $z_v$denote the treatment assignment of village $v$in the randomized controlled trial (RCT). The potential outcome can then be written as $Y_{v,t}(c,z)$, which represents the value of the outcome for village $v$at time t, had it been exposed to a level of conflict $c$and assigned to RCT arm $z \in \{0,1\}$.

Using $Y_{v,t}(c)$instead of $Y_{v,t}(c,z)$, a standard difference-in-differences (DiD) estimand would compare the outcome evolution of conflict-exposed villages to that of conflict-unexposed villages without controlling for RCT assignment. This omission is problematic because RCT exposure is not balanced across levels of conflict exposure: conflict-exposed and conflict-unexposed villages differ not only in their exposure to conflict, but also in their likelihood of receiving the RCT treatment.

Let $X_t$denote a set of time-varying covariates, such as the number of conflict-related events affecting the community at period t, or the number of fatalities resulting from these events. Our parallel-trends assumption can then be written as:

$$\mathbb{E}\left[\Delta Y(c,z) \mid C_1 = c,\, Z = z,\, X_1,\, Z_2\right] = \mathbb{E}\left[\Delta Y(c,z) \mid C_1 = c,\, Z = z,\, X_1\right], \forall (c,z) \in \mathcal{S}(C_1) \times \mathcal{S}(Z).$$

That is, $Y(c,z)$ is mean-independent of C_2 conditional on $\{C_1 = c,\, Z = z,\, X_1\}$. In other words, among villages with the same baseline level of conflict exposure (measured by distance to conflict, number of events, and fatalities within the commune) and the same SELEVER treatment status (control or treatment), the average evolution of outcomes would have been the same had their conflict exposure at endline remained at its baseline level.

In the continuous specification, this assumption motivates controlling for treatment assignment as well as baseline numbers of conflict events and fatalities when estimating the baseline dose-response function for villages whose conflict exposure changes over time.

Program effects in the context of armed conflict: Protective effect of SELEVER against conflict exposure on women's empowerment?

To assess whether the SELEVER program mitigated the potential negative effects of conflict on women's empowerment, we adopt a triple-difference (DDD) approach. Using a binary measure of conflict exposure, we estimate the following regression for each empowerment outcome of interest, which includes a three-way interaction between survey wave, treatment status, and conflict exposure:

$$
\begin{aligned}
Y_{iv} = \quad & \alpha_0 + \alpha_{01}\,\text{Endline}_t + \alpha_{02}\,\text{SELEVER}_v + \alpha_{03}\,\text{ConflictExposure}_{vt} \\
& + \alpha_{11}\big(\text{ConflictExposure}_{vt} \times \text{Endline}_t\big) + \alpha_{12}\big(\text{ConflictExposure}_{vt} \times \text{SELEVER}_v\big) \\
& + \alpha_{13}(\text{Endline}_t \times \text{SELEVER}_v) + \beta\big(\text{ConflictExposure}_{vt} \times \text{Endline}_t \times \text{SELEVER}_v\big) + \varepsilon_{iv}.
\end{aligned}
$$

Our main parameter of interest, β (Muralidharan and Prakash 2017), estimates whether the SELEVER program has differential effects in the presence of conflict. This parameter can be interpreted as a difference of two difference-in-differences estimators (Olden and Møen 2022).

The OLS estimate of β has a causal interpretation under a triple-difference parallel-trends assumption, which is weaker than the standard DiD assumption. Specifically, it requires that, in the absence of conflict, the difference in outcomes between SELEVER-treated and SELEVER-control villages in conflict-exposed areas would have evolved similarly to the corresponding difference in non-exposed areas. Equivalently, absent conflict, the SELEVER program would have affected both areas in the same way—an assumption that is plausible given the randomized assignment of the program.

Interpretation of coefficients

The coefficient α_{11}captures the effect of conflict among SELEVER control villages, under the assumption that outcomes in control villages would have followed parallel trends in the absence of conflict. The coefficient α_{13}captures the effect of the SELEVER intervention in villages not exposed to conflict. The OLS estimators of $\beta$and α_{11}can be written as:

$$
\begin{aligned}
\hat{\beta}_{\text{OLS}} = & \big[(\bar{Y}_{C=1,S=1,T=1} - \bar{Y}_{C=1,S=1,T=0}) - (\bar{Y}_{C=0,S=1,T=1} - \bar{Y}_{C=0,S=1,T=0})\big] \\
& \qquad (= \text{Effect of conflict on SELEVER-treated villages}) \\
& - \big[(\bar{Y}_{C=1,S=0,T=1} - \bar{Y}_{C=1,S=0,T=0}) - (\bar{Y}_{C=0,S=0,T=1} - \bar{Y}_{C=0,S=0,T=0})\big]. \\
& \qquad (= \text{Effect of conflict on SELEVER-control villages})
\end{aligned}
$$

$$
\hat{\alpha}_{11,\text{OLS}} = (\bar{Y}_{C=1,S=0,T=1} - \bar{Y}_{C=1,S=0,T=0}) - (\bar{Y}_{C=0,S=0,T=1} - \bar{Y}_{C=0,S=0,T=0}).
$$

Assessing the protective effect of SELEVER

Assuming the identifying assumptions hold, the interpretation of the estimated parameters is as follows. If $\beta \neq 0$, conflict affects villages differently depending on their SELEVER treatment status. Moreover, if $\alpha_{11} < 0$ (as hypothesized) and $\beta > 0$, then the effect of conflict on SELEVER-treated villages is smaller than the effect of conflict on SELEVER control villages. This pattern indicates that the SELEVER program mitigates conflict exposure.

More generally, the triple-difference estimator allows for a direct comparison between the effect of conflict on SELEVER-treated villages and the effect of conflict on SELEVER-control villages. In some cases, α_{11} may be positive or not significantly different from zero, as observed for certain outcomes such as access to credit, decision-making over credit, and self-efficacy (for example Table 4, which appears later in this text). In such cases, the interpretation of β remains informative. A positive and significant β would indicate that SELEVER amplifies positive responses to conflict exposure, in which case we refer to the

program's effect as a boosting effect, meaning that the combination of both SELEVER and conflict is linked to additional improvements.

Continuous conflict exposure specification

Using a continuous measure of conflict exposure, we estimate the parameter defined above, separately for SELEVER-treated and SELEVER-control villages and compare the estimated effects across subsamples. This approach mirrors the triple-difference logic of the binary specification. Our leading assumption is that, if SELEVER provides a protective effect, the marginal effect of conflict exposure should be smaller in the SELEVER-treatment group. An improvement in outcomes in the treatment arm relative to the control arm therefore signals a protective effect. Improvements correspond to positive changes in outcomes, with the exception of the count version of the work-balance indicator, for which improvements are reflected by a reduction in the total time spent working.

RESULTS

Sample Description

We compare baseline characteristics of households that later experienced increased proximity to conflict and insecurity to those that did not (Table 3). We find that exposed and not exposed households are broadly similar in terms of age, literacy, speaking French, and having a young child. Individuals in the exposed villages are somewhat more likely to have attended school (four percentage points difference), live in slightly smaller households (approximately half a person), and are less often polygynous (3 percentage points difference). Men are around 10 years older than women in the sample. Men are also considerably more likely to read, speak French, and have attended school, compared to women.

Table 3 Characteristics of the sample at baseline

By Conflict Exposure	Not Exposed		Exposed		Difference	
	Mean	N	Mean	N	Mean	p-value
Woman has child under age 2	0.30	719	0.32	684	-0.02	0.533
Age	38.03	1355	37.78	1288	0.25	0.590
Literacy in local language	0.09	1352	0.09	1286	0.00	0.896
Can speak French	0.16	1352	0.14	1286	0.02	0.280
Attended school	0.22	1352	0.26	1286	-0.03	0.046
Household size	8.89	1355	8.40	1288	0.50	0.006
Polygynous household	0.50	1354	0.47	1287	0.03	0.083
By Gender	Women		Men		Difference	
	Mean	N	Mean	N	Mean	p-value
Age	33.16	1405	43.29	1238	-10.13	.<0.001
Literacy in local language	0.06	1400	0.13	1238	-0.06	.<0.001
Can speak French	0.09	1400	0.23	1238	-0.14	.<0.001
Attended school	0.17	1400	0.32	1238	-0.16	.<0.001

Source: The authors' calculations.

Table 4 provides a summary of men's and women's perceptions of conflict-related mobility in 2020. Approximately 20% of men in the sample report being afraid to travel outside the village. A lower percentage of women (14%) express this sentiment. This difference may be because women were less likely to travel outside the village to begin with or because men are more likely to be targeted in attacks. In terms of actually taking specific trips, fewer women and men reported reducing their mobility.

Table 4. Men's and women's perceptions of conflict-related mobility

	Men		***Women***			
	mean	N	Mean	N	Difference	s.e.
Were you afraid to travel outside the village, because of insecurity?	0.20	1306	0.14	361	0.06***	(0.02)
Have you reduced your trips to the market to buy groceries?	0.09	1298	0.08	359	0.01	(0.02)
Have you reduced your trips to the market to sell your products?	0.06	1245	0.05	340	0.01	(0.01)
Have you reduced your trips to the market to find work?	0.03	1031	0.03	286	-0.00	(0.01)
Have you reduced your trips to the health center?	0.02	1299	0.01	359	0.01	(0.01)
Have you reduced your travel to aid/humanitarian centers?	0.01	1035	0.02	292	-0.01	(0.01)
Have you reduced the number of trips you make to buy/sell agricultural equipment	0.04	1264	0.02	327	0.02**	(0.01)
Have you reduced your children's travel to school?	0.03	1262	0.04	345	-0.01	(0.01)

Source: The authors' calculations from SELEVER endline data collected in 2020.

We next examine whether mobility restrictions are associated with changes in distance to conflict. Table 5 presents the differences in the distances to conflict zones between villagers who reported mobility restrictions and those who did not. Overall, we find that fears of traveling and reductions in mobility are positively associated with increased proximity to conflict, especially in 2019 and 2020 as the frequency of conflict events also increased. The correlations between the objective and subjective indicators provides suggestive evidence of these subjective components as potential mechanisms linking conflict and empowerment.

Table 5. Correlation between exposure to conflict and mobility restriction

Year of conflict exposure	2017	2018	2019	2020	2017 to 2020
	Difference (No-Yes)	Difference (No-Yes)	Difference (No-Yes)	Difference (No-Yes)	Difference (No-Yes)
Were you afraid to travel outside the village, because of insecurity?	-2.24*	0.2	4.49***	4.69***	1.80***
Have you reduced your trips to the market to buy groceries?	1.05	-0.66	6.12***	7.39***	2.62***
Have you reduced your trips to the market to sell your products?	1.04	1.19	6.78***	8.12***	2.86**
Have you reduced your trips to the market to find work?	1.11	3.4	3.96*	1.78	2.75
Have you reduced your trips to the health center?	5.51	-1.17	11.63***	9.16***	5.92***
Have you reduced your travel to aid/humanitarian centers?	9.64*	7.58*	9.47***	11.17**	5.29*
Have you reduced the number of trips you make to buy/sell agricultural equipment	2.51	0.58	9.48***	9.20***	4.34***
Have you reduced your children's travel to school?	6.58**	0.29	8.87***	12.57***	4.14***

Source: The authors' calculations.
Note: Sample is pro-WEAI respondents. *p < 0.10, ** p < 0.05, *** p < 0.01

Reduced distance to conflict and empowerment

We present the results separately for the primary and secondary empowerment indicators, as well as results for the binary and count versions of each outcome. The binary versions come from established and validated cut offs, and the count versions are from the underlying data to construct those cutoffs. (See Table 1 for definitions.) The effects of increased proximity to conflict on women and men are presented in forest plots for the primary empowerment outcomes for which we expected to see negative effects on women's empowerment with primary (Figure 4) and secondary (Figure 5) outcomes in separate figures.

The findings show that increased proximity to conflict was linked to women having less input into decisions related to their livelihoods and income. Men who became closer to conflict also experienced significantly less input in livelihood decisions, though at a smaller magnitude; they also experienced a significant increase in control over use of income, at a relatively large magnitude. Examining the count versions of the number of production decisions, the effects are in the opposite direction and increased proximity to conflict was positively associated with the number of livelihood decisions for women, as well as for men. The contrast between the binary and count versions of the productive decisions variables can be interpreted as having input into a larger number of decisions but not having input into decisions in all the areas where they work. The findings on the number of income decisions that women and men make are similar to the findings for the binary indicators (negative association for women and positive association from men). These findings are consistent with our

hypothesis that context leads women to have less input into the full scope of livelihood and income decisions. Taken as a whole, these findings suggests that with increased proximity to conflict that women and men may be communicating and consulting with one another less about household decisions.

Contrary to our hypotheses, increased proximity to conflict was positively associated with whether both women and men had access to credit or a bank account (binary). Increased proximity to conflict was also significantly associated with the total number of financial services used by men, albeit with a small magnitude, but not for women. The increased access to credit and financial services may be due to an increase in aid groups in the region providing more credit services. We find no effect of increased proximity to conflict on work balance. Although work activities may be less efficient, decreased mobility may limit the types of work that individuals are able to complete, leading to a null effect on this outcome.

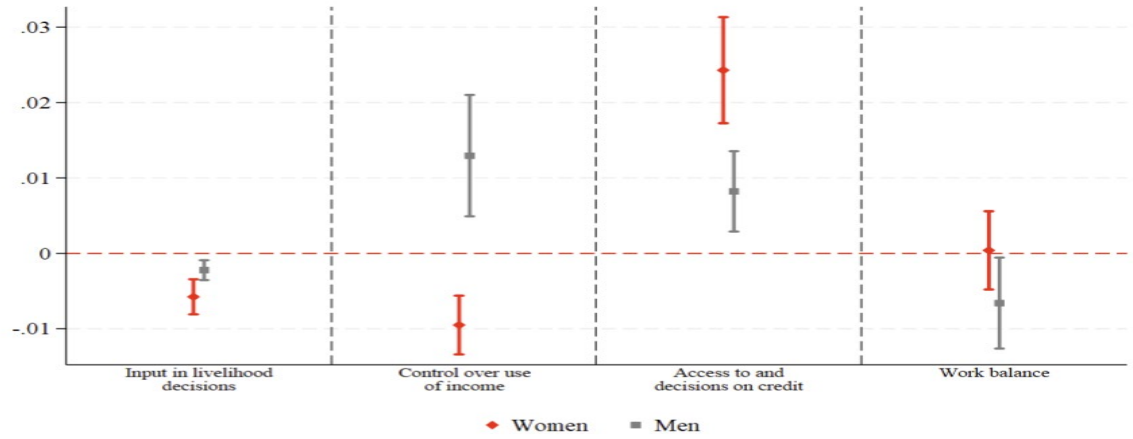
Among the secondary empowerment outcomes, for both the binary (Figure 6) and count (Figure 7) versions of the outcome, we did not have specific hypotheses about the direction of the effects, but several significant effects emerged. First, there was a significant positive association between proximity to conflict and group membership for men. This finding may be due to men's increased membership in local civil defense groups.

In looking at rejection of intimate partner violence among women, we also found a significant negative association between increased proximity to conflict and rejection of intimate partner violence. The binary version of the variable was also nearly significant. Considering this finding in conjunction with other findings on control over income and production decisions, it suggests an overall shift in the acceptability of men maintaining more control within the household as conflict approaches.

Finally, increased proximity to conflict was positively associated with women being more likely to visit at least two important locations (binary variable), but not more locations (count variable). It is worth noting that these are important places, but not necessarily distant places. It is possible that given increased threats to men that women took on more of these types of responsibilities.

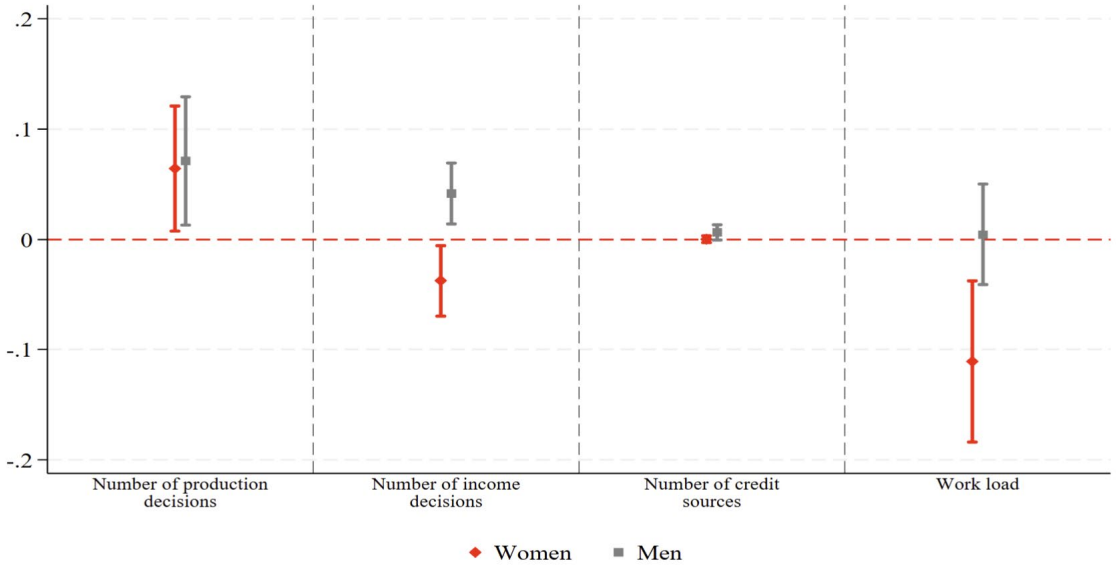
Additionally, there was a non-significant association between increased proximity to conflict and women's self-efficacy (agreement with all statements, but not an overall higher score), along with a similar non-significant trend on women's autonomy in income. These findings are surprising and may be due to either the increase in livelihood-focused aid being delivered in the region, or the fact that terrorist attacks are more likely to target men, meaning that women may end up having more freedom while they are working in the fields for example.

Figure 4. Decreased distance to conflict and empowerment of women and men: Primary outcomes (binary)



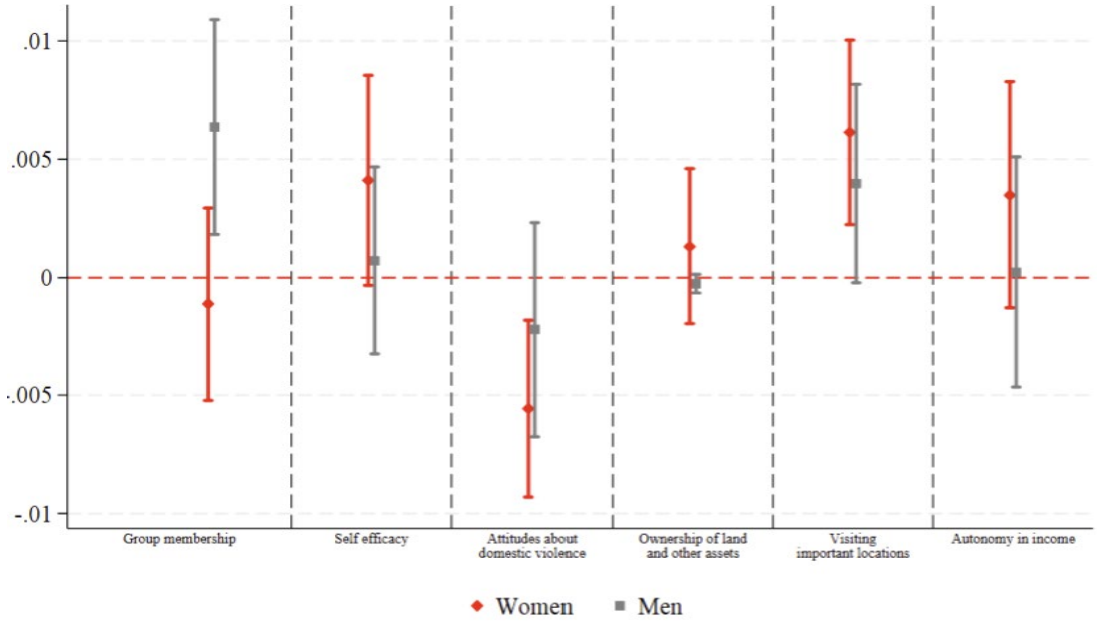
Source: The authors' calculations.
Note: This figure presents the results from the continuous difference-in-differences specification. For each outcome, the dot represents the estimated coefficient on distance to conflict (measured as negative distance), and the vertical line shows the 95% confidence interval (clustered at the commune level). Estimates in red use the women-only sample, while estimates in gray use the men-only sample. Outcomes are binary: Empowered = 1, Disempowered = 0.

Figure 5. Decreased distance to conflict and empowerment of women and men: Primary outcomes (count)



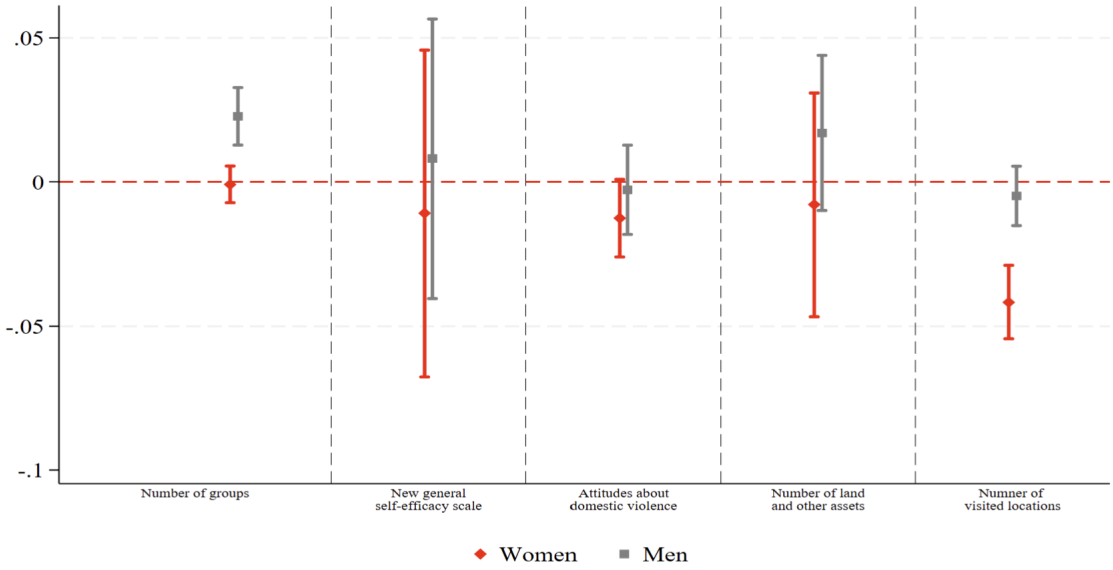
Source: The authors' calculations.
Note: This figure presents the results from the continuous difference-in-differences specification. For each outcome, the dot represents the estimated coefficient on distance to conflict (measured as negative distance), and the vertical line shows the 95% confidence interval (clustered at the commune level). Estimates in red use the women-only sample, while estimates in gray use the men-only sample. Outcomes are count variables defined in Table 1.

Figure 6. Decreased distance to conflict and empowerment of women and men: Secondary outcomes(binary)



Source: The authors' calculations.
Note: This figure presents the results from the continuous difference-in-differences specification. For each outcome, the dot represents the estimated coefficient on distance to conflict (measured as negative distance), and the vertical line shows the 95% confidence interval (clustered at the commune level). Estimates in red use the women-only sample, while estimates in gray use the men-only sample. Outcomes are binary: Empowered = 1, Disempowered = 0

Figure 7. Decreased distance to conflict and empowerment of women and men: Secondary outcomes (count)



Source: The authors' calculations.
Note: This figure presents the results from the continuous difference-in-differences specification. For each outcome, the dot represents the estimated coefficient on distance to conflict (measured as negative distance), and the vertical line shows the 95% confidence interval (clustered at the commune level). Estimates in red use the women-only sample, while estimates in gray use the men-only sample. Outcomes are count variables defined in Table 1.

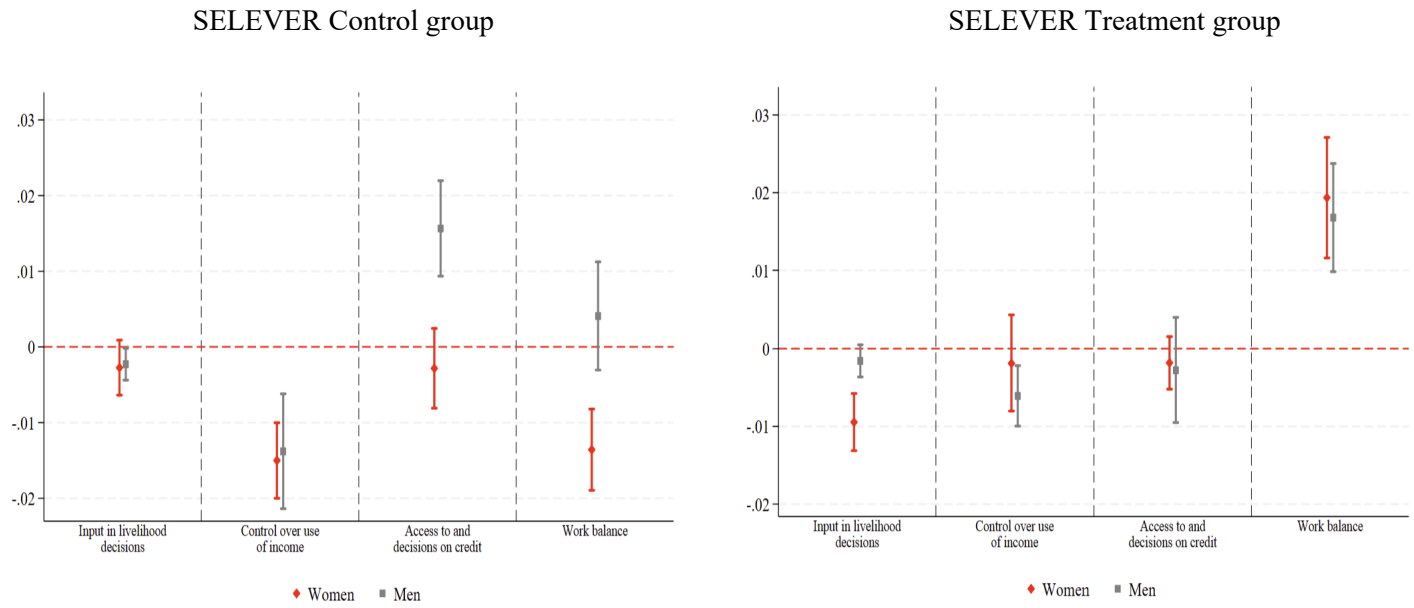
Program effects in the context of armed conflict: Protective effect of SELEVER against conflict exposure on women's empowerment?

In this section, we present results examining whether the associations between increased proximity to conflict and empowerment differed by SELEVER treatment arm. We first present these results graphically (Figure 8-Figure 11). Additionally, Table 6-Table 9 present the results of the estimate of the difference between the two different point estimates with the triple difference coefficient. Importantly a significantly larger effect for the SELEVER treatment group, compared to the control group, suggests a protective effect, with the exception of time spent working (count variable for total time) for which a significantly smaller value suggests a protective effect.

In Figure 8 and Table 6, which look at the primary binary outcome, we find that the SELEVER treatment, when there is increased proximity to conflict, is associated with significantly better work balance outcomes among men relative to the control arm. Among women, the trend is in the same direction but does not reach significance. In Figure 9 and Table 7 the significant negative coefficient for the amount of time spent working suggests a protective effect among both women and men. Referring back to the descriptive statistics, it is worth noting that in this population women have considerably lower levels of work balance and spend more time working compared to men.

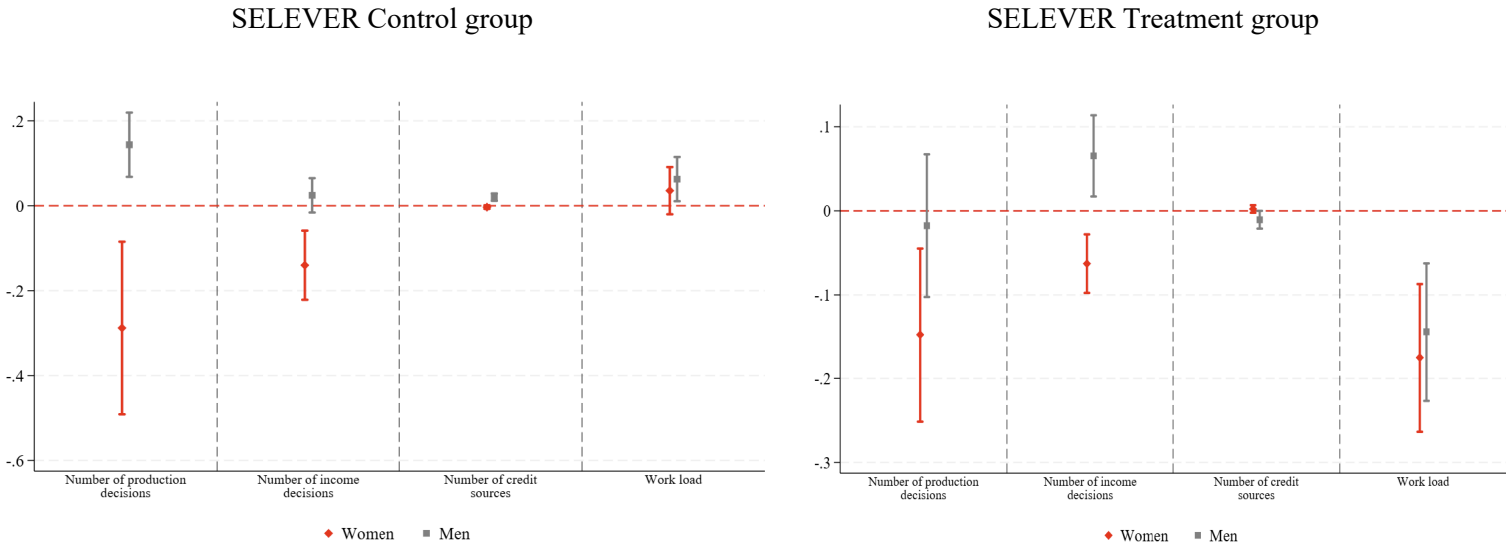
Looking at the secondary outcomes, we find, unexpectedly, that SELEVER treatment withincreased proximity to conflict is associated with worsening outcomes for women's ownership of land and other assets in the treatment arm, relative to the control arm. This finding is consistent across the binary (Figure 10 and Table 8) and count (Figure 11Figure 11. Test for a protective effect of SELEVER: Secondary outcomes (count)and Table 9) versions of the indicator. Women's assets in this context are typically smaller and less valuable ones, such as farm implements or poultry. It is possible that SELEVER activities focused on poultry activities may not have been able to be sustained under conflict circumstances.

Figure 8. Test for a protective effect of SELEVER: Primary outcomes (binary)



Source: The authors' calculations.
Note: Figure reports continuous DID-estimates with 95% CIs. Outcomes are binary: Empowered = 1, Disempowered = 0

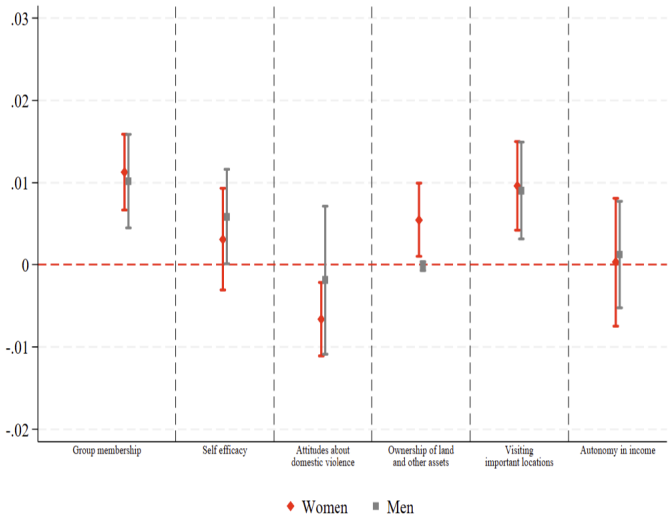
Figure 9. Test for a protective effect of SELEVER: Primary outcomes (count)



Source: The authors' calculations.
Note: Figure reports continuous DID-estimates with 95% CIs. Outcomes are count variables as defined in Table 1.

Figure 10. Test for a protective effect of SELEVER: Secondary outcomes (binary)

SELEVER Control group



SELEVER Treatment group

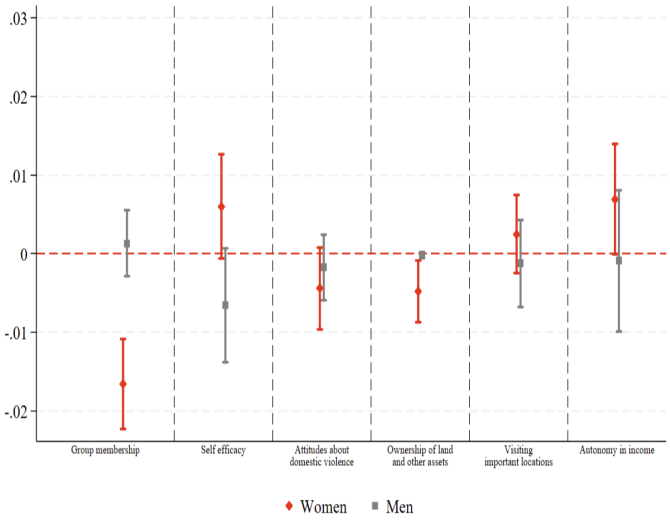
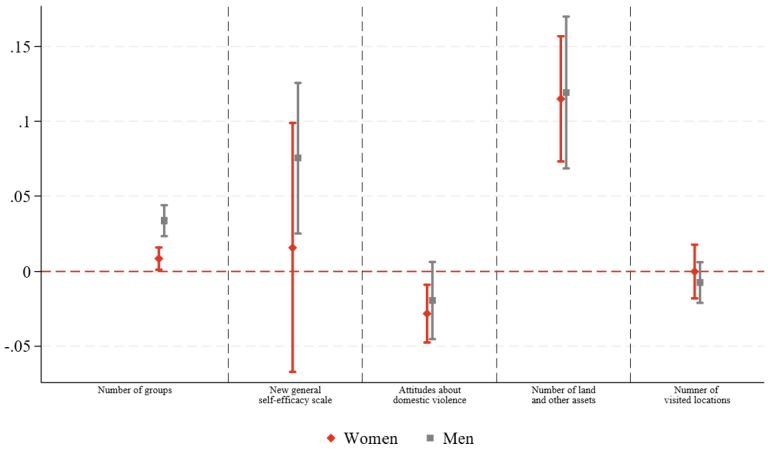
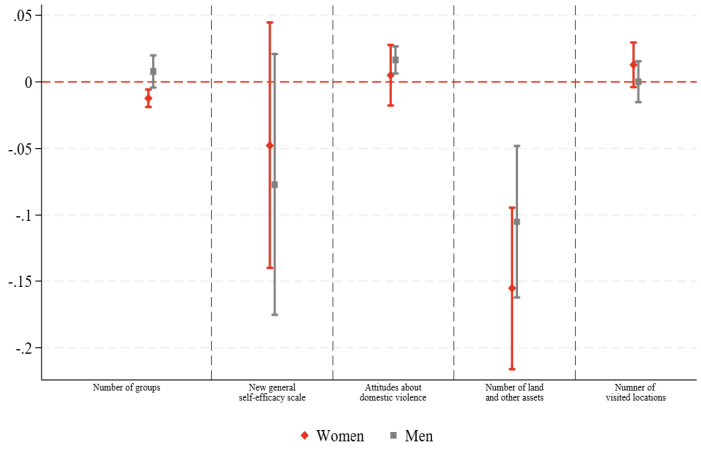


Figure 11. Test for a protective effect of SELEVER: Secondary outcomes (count)

SELEVER Control group



SELEVER Treatment group



Source: The authors' calculations.
Note: Figure reports continuous DID-estimates with 95% CIs. Outcomes are count variables as defined in Table 1.

Table 6. SELEVER and conflict exposure on empowerment: Protective effect diagnostic (primary outcomes, binary)

	Input in livelihood decisions		Control over use of income		Access to and decisions on credit		Work balance	
	Men	Women	Men	Women	Men	Women	Men	Women
SELEVER × Conflict × Post	0.0105	-0.0130	0.0571	0.1323	-0.2182*	-0.0359	0.2450**	0.2023
	(0.0345)	(0.0741)	(0.0847)	(0.1221)	(0.119)	(0.0728)	(0.0957)	(0.1264)
Conflict Exposed × Post	-0.0161	0.0062	-0.105*	-0.0966	0.2184***	0.0790	-0.1348**	-0.1629
	(0.0236)	(0.0550)	(0.0548)	(0.0902)	(0.0724)	(0.0571)	(0.0634)	(0.0992)
Post	0.0151	-0.0238	0.0235	-0.0057	-0.1423**	-0.0509	0.0528	0.0887
	(0.0189)	(0.0382)	(0.0430)	(0.0591)	(0.0602)	(0.0502)	(0.0506)	(0.0934)
SELEVER × Post	-0.0093	0.0308	-0.0560	-0.0688	0.1262	0.0707	-0.1403**	-0.0962
	(0.0270)	(0.0521)	(0.0593)	(0.0758)	(0.0833)	(0.0597)	(0.0671)	(0.1080)
Observations	2266	2534	2266	2534	2266	2534	2107	2365
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table shows results of our binary triple difference specification (regressing each outcome, in column, onto conflict exposure (measured by a dummy turning on if the village distance to conflict decrease by more than 10 km from 2017 to 2020) controlling for conflict intensity (measured by the number of events and the number of fatalities recorded within the commune of the village), the RCT-treatment status, villages fixed-effects, and the different interactions. Standard errors are clustered at the community level. Significance levels for tests of equality: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 7. SELEVER and conflict exposure on empowerment: Protective effect diagnostic (primary outcomes, count version)

	Number of production decisions		Number of income decisions		Number of credit sources		Time spent working	
	Men	Women	Men	Women	Men	Women	Men	Women
SELEVER × Conflict × Post	-0.3735	-1.0775	0.0873	-1.2366	-0.2232	-0.0477	-2.4923**	-2.6245**
	(1.6682)	(1.5405)	(1.0001)	(0.8087)	(0.1651)	(0.0942)	(1.0687)	(0.9924)
Conflict Exposed × Post	0.2469	0.7020	0.0077	-0.0492	0.3111***	0.1135	1.7302**	2.5509***
	(1.2633)	(1.0469)	(0.7193)	(0.5598)	(0.1093)	(0.0720)	(0.7026)	(0.6578)
Post	1.4752*	1.7347**	15.4692***	7.5809***	-0.2236**	-0.0751	1.9567***	5.1017***
	(0.8583)	(0.8122)	(0.4313)	(0.4061)	(0.0903)	(0.0615)	(0.6829)	(0.5551)
SELEVER × Post	0.4120	0.2132	-0.3503	0.3099	0.2164	0.1134	0.9687	0.9594
	(0.9965)	(1.1695)	(0.6340)	(0.5750)	(0.1323)	(0.0726)	(0.8601)	(0.8188)
Observations	2259	2505	2266	2534	2266	2536	2107	2365
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table shows results of our binary triple difference specification (regressing each outcome, in column, onto conflict exposure (measured by a dummy turning on if the village distance to conflict decrease by more than 10 km from 2017 to 2020) controlling for conflict intensity (measured by the number of events and the number of fatalities recorded within the commune of the village), the RCT-treatment status, villages fixed-effects, and the different interactions. Standard errors are clustered at the community level. Significance levels for tests of equality: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 8. SELEVER and conflict exposure on empowerment: Protective effect diagnostic (secondary outcomes)

	Group membership		Self-efficacy		Attitudes about domestic violence		Ownership of lands and other assets		Visiting important locations		Autonomy in income	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
SELEVER × Conflict × Post	-0.0431	-0.0570	-0.0249	-0.0825	0.0504	0.0243	-0.0171	-0.1653***	-0.0811	0.0080	0.0442	-0.0340
	(0.1289)	(0.1027)	(0.0738)	(0.1061)	(0.0854)	(0.0732)	(0.0139)	(0.0553)	(0.0748)	(0.0849)	(0.0989)	(0.1210)
Conflict Exposed × Post	0.1742	0.1129	0.0645	0.1652**	-0.0652	0.0164	-0.0012	0.0718	0.0463	-0.0076	-0.0380	-0.0385
	(0.1038)	(0.0866)	(0.0490)	(0.0744)	(0.0745)	(0.0556)	(0.0090)	(0.0454)	(0.0545)	(0.0662)	(0.0747)	(0.0944)
Post = 1	-0.0574	0.0347	0.0396	0.0085	0.1381**	-0.0278	0.0038	0.0171	-0.1372***	-0.0416	-0.0953	-0.1200
	(0.0702)	(0.0542)	(0.0367)	(0.0619)	(0.0641)	(0.0391)	(0.0078)	(0.0370)	(0.0241)	(0.0505)	(0.0587)	(0.0747)
SELEVER × Post	0.1704**	0.1236*	-0.0275	0.0928	-0.1605**	-0.0676	0.0047	0.0640	0.0317	-0.0397	-0.0279	0.0382
	(0.0821)	(0.0700)	(0.0484)	(0.0730)	(0.0695)	(0.0548)	(0.0097)	(0.0456)	(0.0370)	(0.0598)	(0.0797)	(0.0931)
Observations	2266	2534	2266	2534	2266	2534	2266	2534	2266	2534	2266	2534
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table shows results of our binary triple difference specification (regressing each outcome, in column, onto conflict exposure (measured by a dummy turning on if the village distance to conflict decrease by more than 10 km from 2017 to 2020) controlling for conflict intensity (measured by the number of events and the number of fatalities recorded within the commune of the village), the RCT-treatment status, villages fixed-effects, and the different interactions. Standard errors are clustered at the community level. Significance levels for tests of equality: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 9. SELEVER and conflict exposure on empowerment: Protective effect diagnostic (secondary outcomes, count version)

	Number of groups		New general self-efficacy scale		Attitudes about domestic violence		Number of lands and other assets		Number of visited locations	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
SELEVER × Conflict × Post	-0.2174	-0.1238	0.3944	-0.6595	0.3117	0.0967	-0.6128	-1.2292**	0.0211	0.2173
	(0.2177)	(0.1674)	(1.0498)	(1.4529)	(0.2878)	(0.2572)	(0.6134)	(0.5850)	(0.2324)	(0.2500)
Conflict Exposed × Post	0.3984**	0.2040	0.1078	0.9735	-0.3726	-0.0576	0.4213	0.2912	-0.0813	-0.2772
	(0.1714)	(0.1385)	(0.8261)	(1.0883)	(0.2424)	(0.1946)	(0.4914)	(0.3676)	(0.1312)	(0.1827)
Post = 1	-0.2691**	-0.0509	1.1921*	1.4558	0.4720**	0.0261	0.2108	-2.8463***	-0.4270***	-0.0199
	(0.1302)	(0.1028)	(0.6888)	(0.9154)	(0.2257)	(0.1354)	(0.4160)	(0.3148)	(0.0768)	(0.1570)
SELEVER × Post	0.4153**	0.2737**	-0.5930	0.5177	-0.4668*	-0.0896	0.3582	0.4355	0.0262	-0.1083
	(0.1581)	(0.1186)	(0.8729)	(1.1592)	(0.2425)	(0.1776)	(0.5075)	(0.4769)	(0.1213)	(0.1781)
Observations	2266	2534	2266	2534	2266	2534	2266	2534	2266	2536
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table shows results of our binary triple difference specification (regressing each outcome, in column, onto conflict exposure (measured by a dummy turning on if the village distance to conflict decrease by more than 10 km from 2017 to 2020) controlling for conflict intensity (measured by the number of events and the number of fatalities recorded within the commune of the village), the RCT-treatment status, villages fixed-effects, and the different interactions. Standard errors are clustered at the community level. Significance levels for tests of equality: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

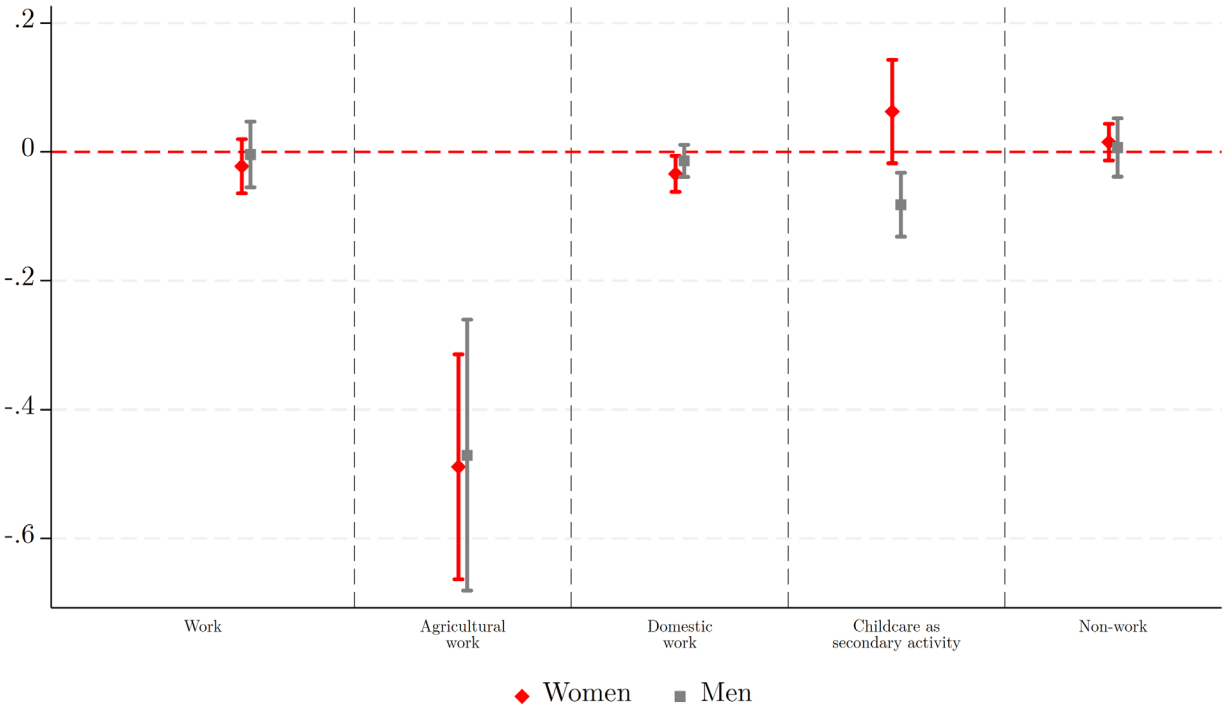
Reduced distance to conflict and categories of time use

Given the findings on the protective effect of SELEVER on work balance and the total amount of time spent working, we disaggregate the data into different categories of time use: work broadly speaking (both productive and domestic work), agricultural work, domestic work, childcare as a secondary activity (i.e. simultaneously while conducting other activities), and non-work. Notably, very little time was reported as being spent exclusively on childcare, and in the vast majority of cases childcare is reported as an activity being conducted alongside another primary activity.

In Figure 12 we find evidence of three phenomena. First, conflict is associated with women spending slightly less time on domestic work, overall. (Both are statistically significant.) It is important to note that women are still spending a relatively large amount of time and more time than men on domestic work. When looking at childcare specifically, we find that conflict is associated with women spending somewhat more time on childcare (nearly statistically significant) and men dedicating somewhat less time (statistically significant). For women, the magnitude of the effects for childcare is approximately twice the size of the effects on domestic work and in the opposite direction, which suggests that the reduction in domestic work is occurring for other care activities (e.g., cleaning, cooking, collecting water and firewood). An explanation for these findings is that, due to security concerns, both women and men may be spending more time at home. This may mean that there are more women present in the household to support domestic work. At the same time, as a result of being home, more household members are engaging in childcare activities.

Finally, we find that among both women and men increased proximity to conflict is associated with spending significantly less time on agricultural labor. In this context, crop-based agriculture and management of large livestock typically occur in more remote areas, away from the central village. These activities may be avoided or done hastily to minimize exposure to risk.

Figure 12. Decreased distance to conflict and categories of time use



DISCUSSION

Long known for peace and stability in the Sahel, Burkina Faso is now at the epicenter of regional conflicts. What does this mean for the empowerment of women and men living in villages that are increasingly closer to insecurity and conflict? We examine this question using panel data from the impact evaluation of SELEVER, a gender- and nutrition-sensitive poultry value chain intervention spanning 2017-2020. We first asked whether the experience of living in a village that experienced increased proximity to conflict hotspots effected the empowerment of women and men. To answer this question, we estimated continuous difference-in-difference models (time by change in distance to conflict) on women's and men's empowerment across the ten domains in pro-WEAI. Previous studies examining the links between conflict and empowerment have been limited in their scope of empowerment. The pro-WEAI metric allows for a more comprehensive view of men's and women's empowerment.

One notable takeaway from our findings is that as distance to conflict decreases, both women and men are contributing to more production decisions, and at the same time they are less likely to have input into decisions for all the activities they participate in. Additionally, women have less control over use of income and make fewer income decisions. One way of interpreting these findings is that there is a decrease in joint decisions and potentially coordination between spouses on major decisions. These findings are similar to cross-national patterns reported by Le and Nguyen (2023), for example, whereby there are lower levels of women's decision-making influence following periods of conflict. Additionally, we find an increased tolerance of IPV, among women, which lends further support to the previous conclusion related to decreased coordination and communication between spouses. The increased tolerance of IPV is consistent with studies focused on IPV behaviors that found an increase in IPV behaviors during the 2014 Israeli military operation in Gaza, as well as in Mali in 2018 (Ekhator-Mobayode et al. 2021; Müller and Tranchant 2019). In the case of the insecurity conditions in Burkina Faso, we are not seeing prolonged absences of men in these villages, and women already have limited decision making input (Heckert et al. 2023). These findings may be partially driven by intrahousehold stress and tensions.

Contrary to our expectations, we also found an increase in group membership among men, an increase in access to and decisions on credit among both women and men, an increase in visiting important locations among women, and a tendency toward increased self-efficacy and autonomy in income among women. What might be the reasons for such findings? Many of the reasons may be less about conflict directly and more of a consequence of how communities respond to conflict and how aid is delivered.

The increase in group membership among men was unexpected and may occur because of how aid is being delivered or because of the formation of local security groups. The groups organized to receive aid may also be responsible for the increase in credit. Most aid interventions target or organize people into associations or groups. Village savings and loan groups are a common type of community group in the region. Their activities typically reach farther than financial services alone, and they aim to meet a range of community needs (Margolies, Heckert, and Meinzen-Dick 2024). There are also defense groups created by the government in recent years, Volontaires de Défense de la Patrie (VDP) (Volunteers for the Defense of the Homeland), and present in practically every village.

With regards to the increase in women's self-efficacy and autonomy in income, this finding may be related to how conflict-related aid is being delivered. Across Burkina Faso, in areas of insecurity NGOs and United Nations agencies provide emergency humanitarian aid in the form of food and other assistance. They are also providing income-generating activities to displaced people or people who have fled their homes. Most of this aid is channeled through the Ministry of Humanitarian Action, which is decentralized and targets women and children as a priority. The availability of these forms of support and the targeting of women specifically may be one reason for the increase in self-efficacy. This findings is similar, for example, to a study in Gaza that found that humanitarian assistance that supported livelihoods led to an increase in self-efficacy (Hammad and Tribe 2020). An alternative explanation for the increase in women's self-efficacy in areas where conflict has moved closer is that these attacks often target men, more so than women. This leaves women more able to carry out their activities (e.g. work in the fields) with greater independence and less risk of attack than men. These same phenomena may also be why women are more likely to visit important locations.

In our second research question, we set out to examine whether the SELEVER intervention had any protective effect on the empowerment of women and men. We find a protective effect of work balance for men and less time spent working for both women and men. Men a who lived in SELEVER treatment villages and experienced increased proximity to conflict-related events were more likely to have work balance, compared to the experiences of the control arm, and both women and men in the treatment arm spend less time working compared to the control arm, after accounting for increased proximity to conflict. The gender components of the SELEVER programming did focus on raising awareness of women's time burden, especially among men and influential community members (Heckert et al. 2023). These program components coupled with increased concerns about women traveling away from home may have specifically reduced their time spent working.

Why then do we fail to find impacts on other domains of empowerment? For that explanation we turn to previous work explaining the null effects of SELEVER treatment on women's empowerment (Heckert et al. 2023). This previous work concluded that the null effects may be attributable to the

intervention having too light a touch (Leight et al. 2022), the high levels of disempowerment in the study population, or the particularly high levels of poverty in the study areas may have made is difficult to invest in poultry as part of the program. Moreover, the presence of conflict and the fact that it might lead to poultry theft or poor access to markets may have made it even more difficult to invest in poultry.

These findings also leave us wondering: what types of strategies might work to empower women in the context of conflict? Given the likely risk and challenges with marketing poultry, investing in digital tools and networks that allow women sellers and traders to communicate with one another might be one approach. For these approaches to be successful in a setting where trust of strangers has likely declined due to conflict and women do not always own their own phone, there would need to be complementary strategies to build trust.

An additional finding of this study worth highlighting is the impact of conflict on time use. When we further disaggregated categories of time use, the most meaningful findings were on changes in time spent on childcare. Women were spending more time on childcare activities as conflict moved closer, and men less time. This finding may be attributable to women spending more time near home or taking children with them while working, especially if schools are closing more frequently. Not only does this draw attention to women's increased burden of working and caring for children simultaneously, it also points to the need for children's and childcare services that can be adapted to conflict environments.

Study limitations

This study has several limitations. First, conflict is not random, which limits us to non-experimental methods and the related limitations. The precarity of the situation also makes it impossible to conduct qualitative work that could help us better understand the mechanisms behind the quantitative findings. Finally, we are limited to the indicators of empowerment that are measured in pro-WEAI. It is possible that there are impacts on other domains of women's empowerment (e.g., on fertility decisions), but those were not measured.

Conclusion

We examined the effects of increased proximity to conflict in Western and Central Burkina Faso on women's empowerment and determined whether the SELEVER program offered any protective effects. We found that proximity to conflict had negative effects on men's and women's input in productive and income decisions, suggesting a decrease in joint decisionmaking and intrahousehold coordination. Moreover, a concerning finding shows increased acceptability of IPV among both women. As a whole, these findings suggest that in addition to the conflict that surrounds their communities, intrahousehold

conflict is also increasing. Unexpectedly, we also found that increased proximity to conflict led to an increase in access to and decisions on credit and an increase in men's group members. These findings may be attributable to community responses and the delivery of humanitarian support. The SELEVER program offered protective effects that were limited to protecting the work balance and reducing the overall time spent working among women and men. A notable contribution of this study is its use of innovative methodologies for examining non-random shocks in the context of an RCT. It also highlights the need to identity approaches for supporting women's empowerment in conflict settings.

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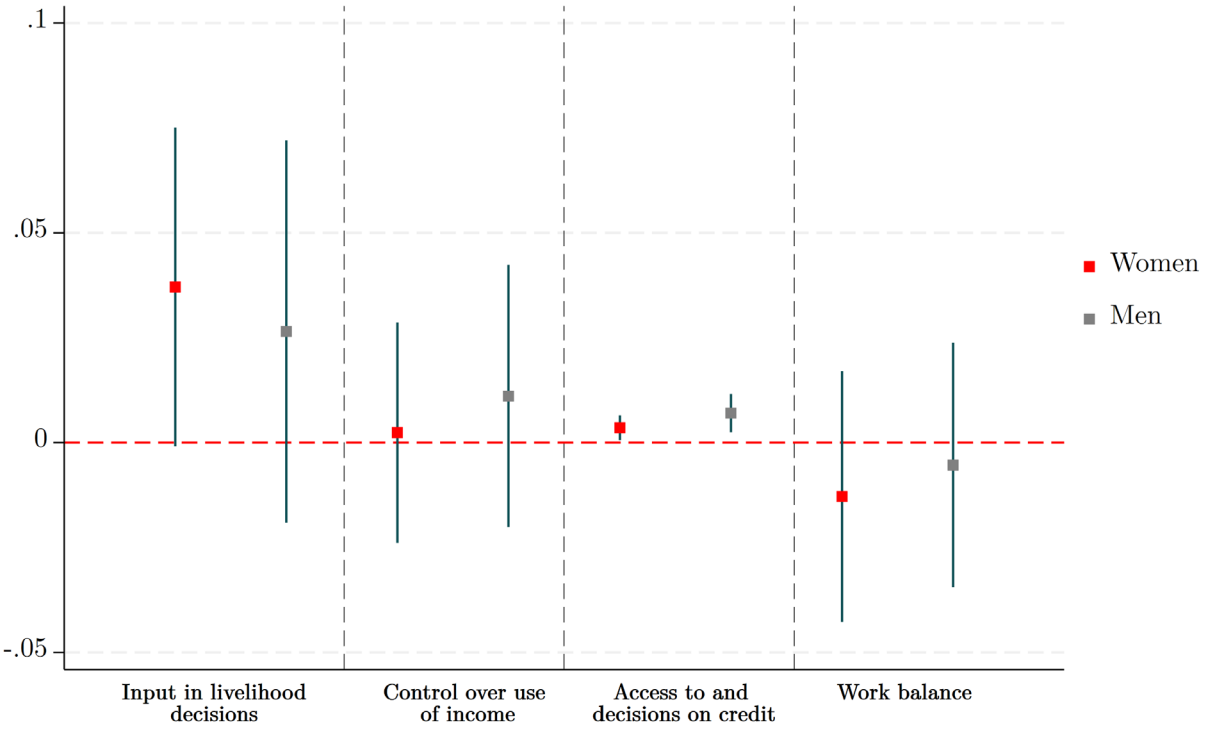
APPENDIX

Fixed-effects models predicting distance to conflict

Below, we present the results for models that predict our primary outcomes using distance to conflict and fixed-effects at the individual level. The results show a non-significant increase in input in livelihood decisions and a significant increase in access to and decisions on credit.

Appendix Figure 1: Effect of proximity to conflict on empowerment of women and men using fixed-effects models



Source: The authors' calculations.
Note: Figure reports estimates of household fixed-effects models with 95% CIs. Outcomes are binary: Empowered = 1, Disempowered = 0

Binary exposure to conflict measurement difference-in-differences

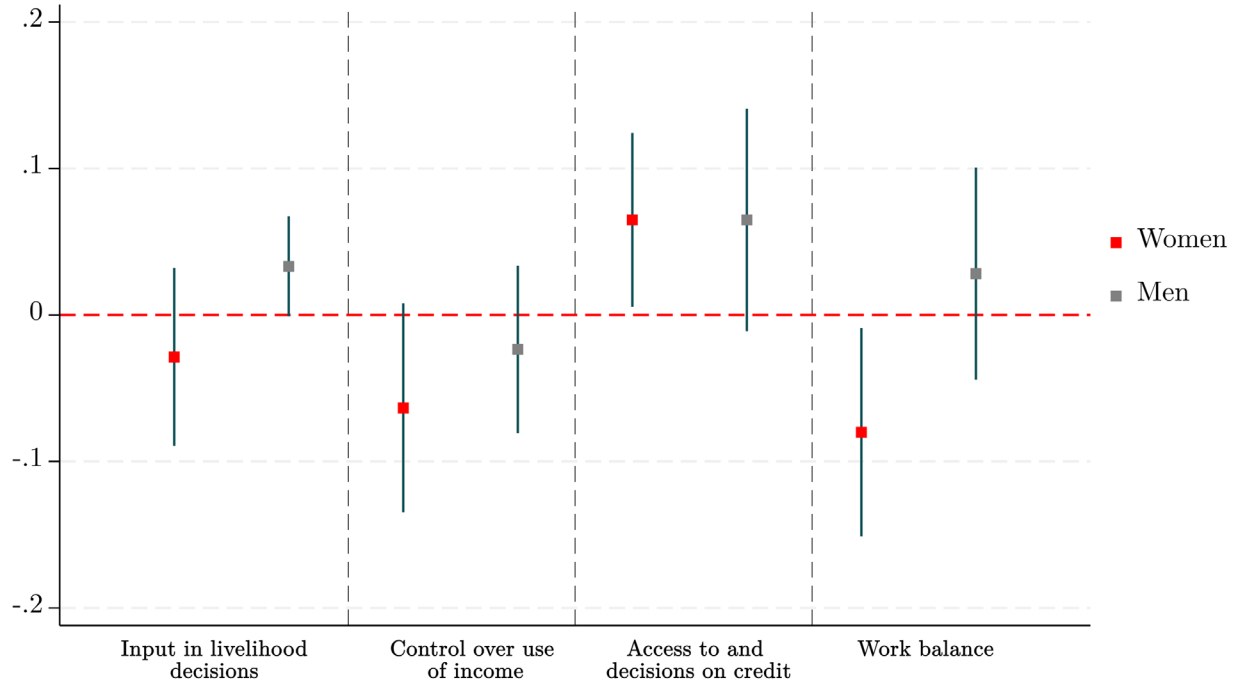
In this section, we provide an alternative methodological approach by using traditional DID models. We group each village's distance to the nearest conflict event into bands (e.g., 0–5 km, 5–10 km, 10–15 km) and classify a village as **exposed** if its distance decreases by at least 5 km between baseline (2017) and endline (2020). Figure 1 summarizes these changes and distinguishes three groups: **switchers-in** (when conflict moved closer in 2020 relative to 2017), **switchers-out** (moved farther), and **controls/stayers** (no change). To estimate the effect of exposure on the main outcomes, we compare switchers-in (red dots) to controls (gray dots). This comparison isolates the impact of moving closer to conflict; estimates can be

interpreted as the effect of "getting closer to conflict" on the outcomes of interest, relative to villages with unchanged proximity. We estimate the following regression.

$$Y_i = \alpha_0 + \alpha_v + \alpha_1 Endline + \alpha_2 ConflictExposure_{vi} + \beta\, ConflictExposure_{vi} \times Endline + +\epsilon_i$$

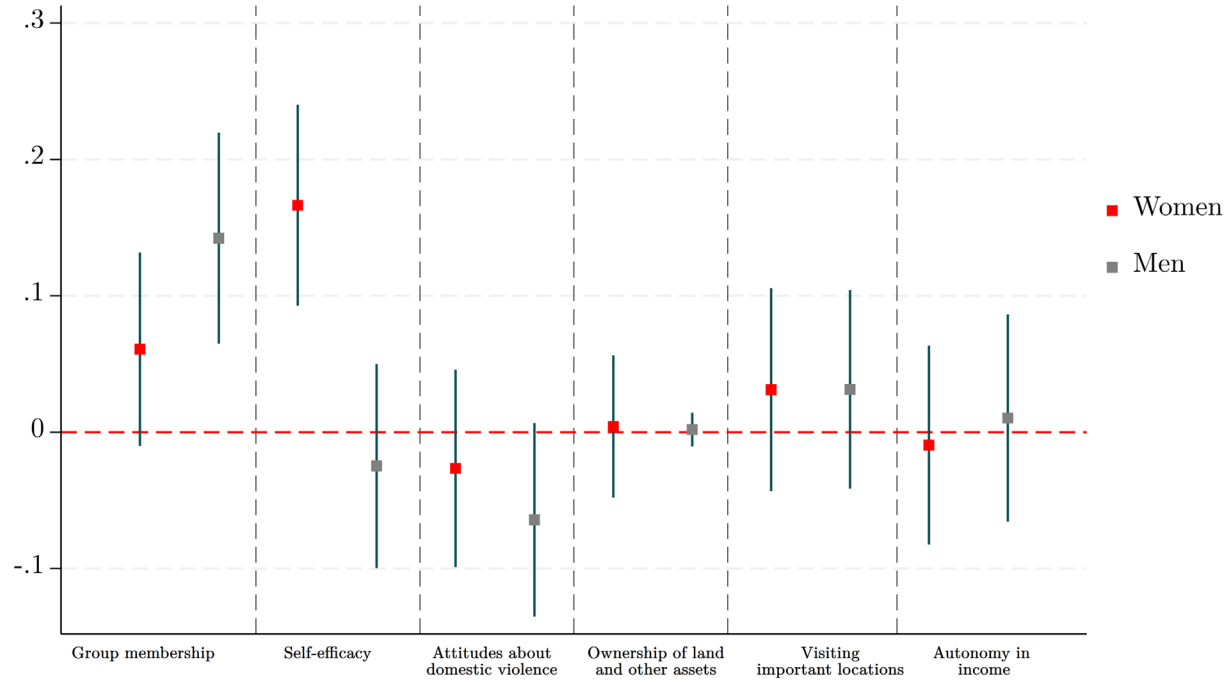
Where $\text{ConflictExposure}_{vi}$ is a dummy equal to 1 if from baseline to endline the village v, that individual i belongs to, has become closely exposed to conflict hotspot (e.g., conflict moving closer to the village from a radius of 20 km to a radius of 10 km), and α_v a village fixed-effect.

Appendix Figure 2: Effect of changing proximity to conflict on empowerment of women and men: Primary outcomes (binary)



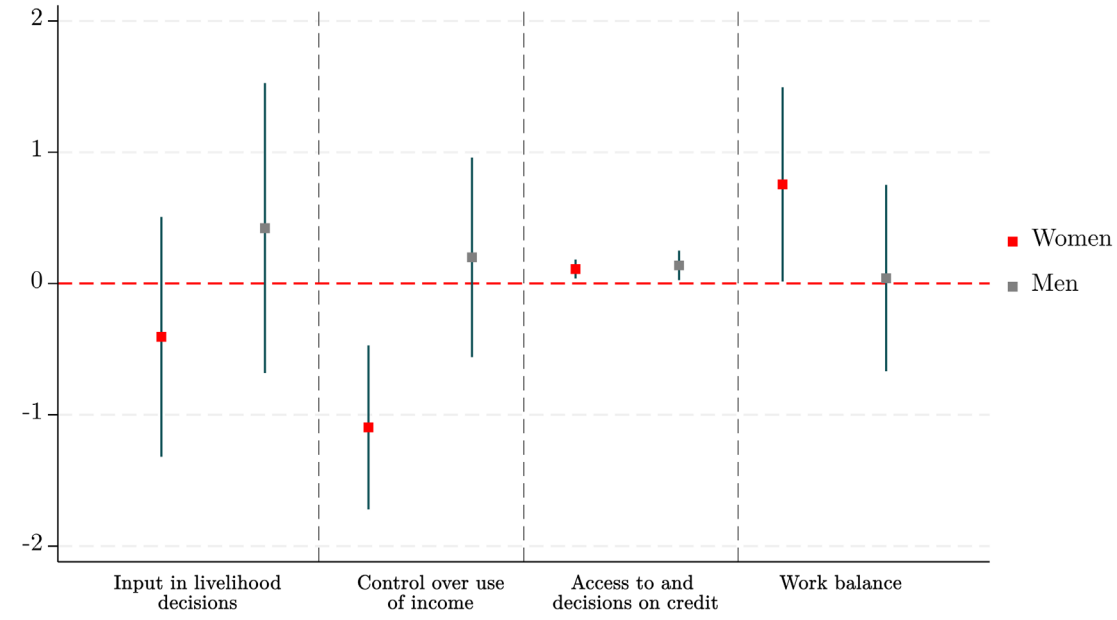
Source: The authors' calculations.
Note: Figure reports DID-estimates with 95% CIs. Outcomes are binary: Empowered = 1, Disempowered = 0

Appendix Figure 3: Effect of changing proximity to conflict on empowerment of women and men: Secondary outcomes (binary)



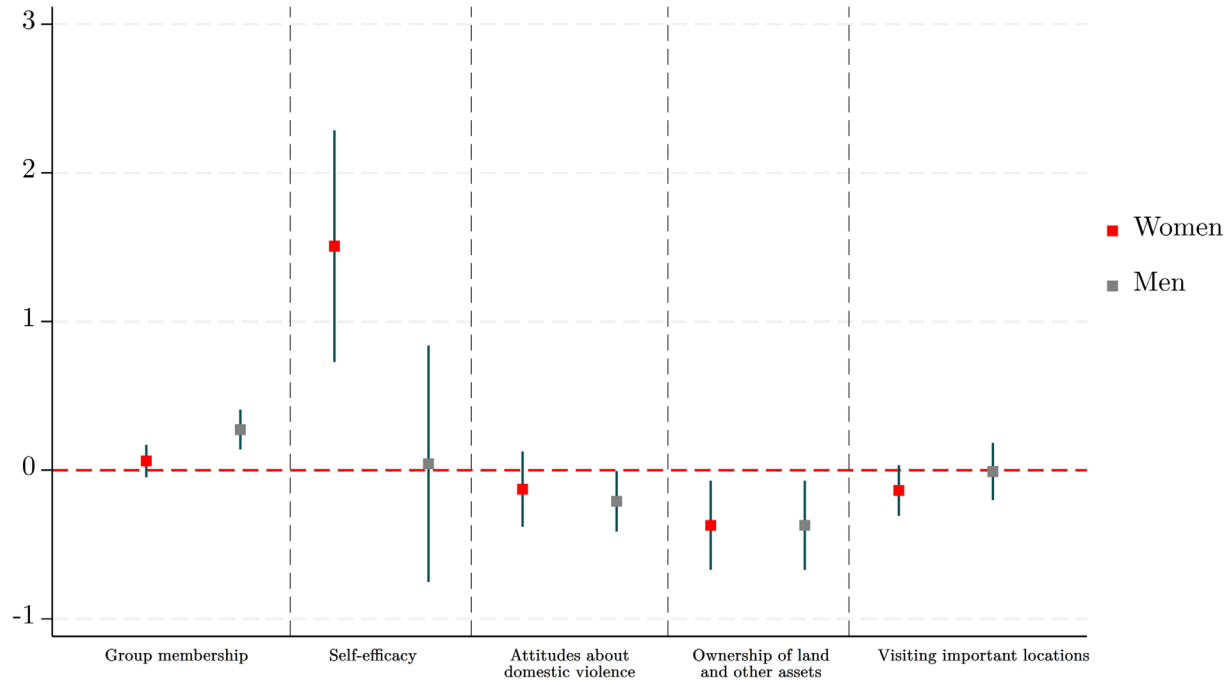
Source: The authors' calculations.
Note: Figure reports DID-estimates with 95% CIs. Outcomes are binary: Empowered = 1, Disempowered = 0

Appendix Figure 4: Effect of changing proximity to conflict on empowerment of women and men: Primary outcomes (count)



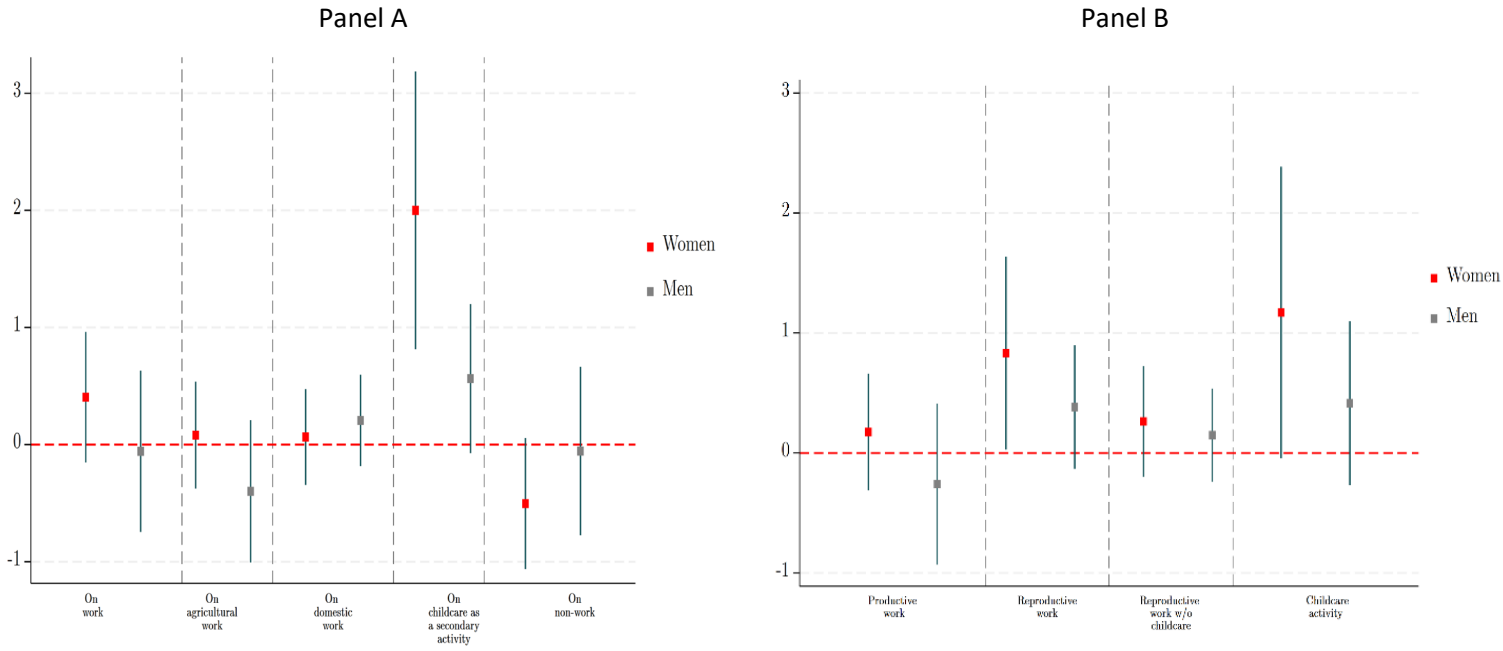
Source: The authors' calculations.
Note: Figure reports DID-estimates with 95% CIs. Outcomes are count and defined in Table 1.

Appendix Figure 5: Effect of changing proximity to conflict on empowerment of women and men: Secondary outcomes (count)



Source: The authors' calculations.
Note: Figure reports DID-estimates with 95% CIs. Outcomes are count and defined in Table 1.

Appendix Figure 6: Effect of changing proximity to conflict on women's and men's time allocation



Source: The authors' calculations.
Note: Figure reports DID-estimates with 95% CIs. Outcomes are categories of time allocation in minutes.

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