

Trials Under Fire:

RCT and Women's Empowerment Amid Insecurity in Burkina Faso

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Roadmap

1. Introduction
2. Motivating evidence
3. Experiment, Data & Strategy
4. Strategies
5. Results
6. Conclusion & Discussion

Intro

Motivation: When RCTs meet the real world

Over the last decades, RCTs have become the gold-standard method to address complex and cutting-edge questions, especially in LMICs.

- While randomization allows to confidently attribute the difference in outcomes to the intervention being tested, randomized studies are not often unsensitive to general environmental, political, and economical factors ([Gibson et al., 2017](#)).
- Unforeseen events, such as rising insecurity, can pose a serious threat to the success of a program once implementation has begun. These threats from conflict-affected areas can both affect program take-up rate and deteriorates outcomes targeted by the intervention.
 - see [McKenzie et al. \(2017\)](#) in Yemen, [Beath et al. \(2013\)](#) in Afghanistan, or [Blattman and Annan \(2016\)](#) in Liberia

Preview of this paper

Scope: This paper concerns both possibilities and goes further.

Context: Focusing on the context of rising insecurity in Burkina Faso and its interaction with 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 designed to improve women's empowerment.

Questions:

- (1) How did the increasing insecurity in the Sahel affect the intervention take-up?
- (2) Did it affect women's empowerment?
- (3) If so, did the program help mitigate these negative effects?

Methodological challenges and solutions:

- (1) Conflict does not strike randomly. [Example](#)
 - Exploit variation in conflict exposure at different periods.
- (2) What is the best way to measure/define conflict exposure?
 - Perception VS Objective indicators? [Here](#)

Main findings:

- Strong correlation between proximity to conflict hotspots and low interventions take-up.
- Conflict weakened key dimensions of women's empowerment
- As insecurity intensified, women lost bargaining power within households, displayed reduced control over income, ceded greater decision-making influence to men in livelihood activities, and reported higher acceptance of intimate partner violence.
- small evidence that the SELEVER cushioned women from some of the adverse effects of conflict, except on work balance

Literature:

- Women's empowerment is multi-dimensional → Instrumental, intrinsic, and collective agency (Rowlands, 1998; Malapit et al., 2019).
- Conflict constrains women through multiple channels → Restricted mobility, household disruption, stress, and norm shifts (Justino et al., 2012; Eissler et al., 2020; Heckert et al., 2020; Ma and Kusakabe, 2015).
- Effects on decision-making and labor are ambiguous → Mixed evidence across contexts and domains (Calderón et al., 2011; Ekhatior-Mobayode et al., 2021; Le and Nguyen, 2023; La Mattina and Shemyakina, 2024).
- Evidence on intrinsic and collective agency remains limited → Context-specific effects on self-efficacy and political participation (Hammad and Tribe, 2020; Yadav, 2021; Kreft, 2018; Webster et al., 2019; Bakken and Buhaug, 2021).

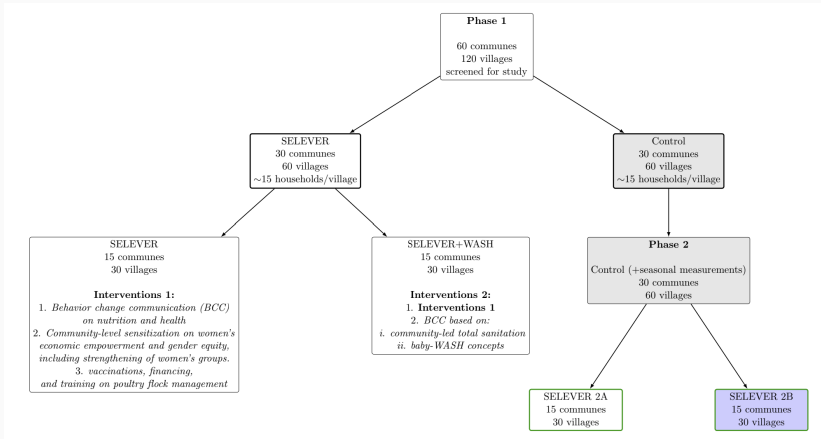
Motivating evidence

Table 1: Definitions of empowerment variables and baseline means

	(1)	(2)	(3)	(4)	(5)
	Men		Women		Difference (M-W)
Variable	Mean	N	Mean	N	
Binary version of pro-WEAI indicators (Mean in %)					
Intrinsic agency					
<i>Autonomy in income</i>	54.60	1478	44.17	1637	0.1043***
<i>Self-efficacy</i>	66.37	1478	53.82	1637	0.1256***
<i>Rejection of IPV</i>	74.63	1478	51.86	1637	0.2276***
Instrumental agency					
<i>Input in productive decisions</i>	94.86	1478	77.70	1637	0.1715***
<i>Ownership of land and other assets</i>	99.26	1478	87.17	1637	0.1208***
<i>Access to and decisions on financial services</i>	37.82	1478	21.08	1637	0.1675***
<i>Control over use of income</i>	82.48	1478	60.97	1637	0.2151***
<i>Work balance</i>	71.49	1473	31.34	1637	0.4015***
<i>Visiting important locations</i>	62.52	1478	45.82	1637	0.1670***
Collective agency					
<i>Group membership</i>	51.22	1478	46.79	1637	0.0442**
<i>Respect among household members</i>	77.18	1402	60.36	1496	0.1681***

Experiment, Data & Strategy

Figure 1: Schematic view of the RCT and A/B Test randomization design



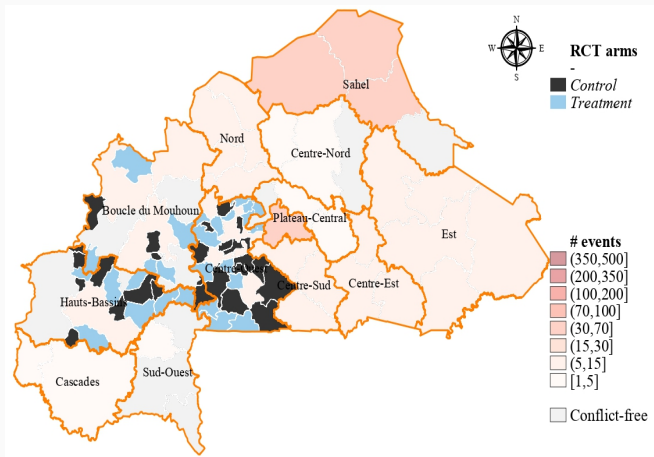
Data: Survey Data

- Census Data: 2006 and 2019
- Pre-intervention census BC
 - A full household census in each community to collect basic demographic information and construct the sampling frame.
 - Georeferenced data on villages (coordinates) and contact details of village chiefs.
- Baseline surveys: 2017 BC1, BC2
 - collected a wide range of information, including women's empowerment indicators, women's health and nutrition knowledge
 - + Villages, Households and individuals characteristics
- Follow-up surveys: 2022-2023
 - participation in the A/B Test activities such as training attendance, the number of sessions attended, and engagement in VSLA trainings, savings, loans, and related activities.
 - + Same outcomes/variables as in Baseline surveys.

Data: Objective measurement of conflict exposure

- ACLED Data: 2017, Baseline

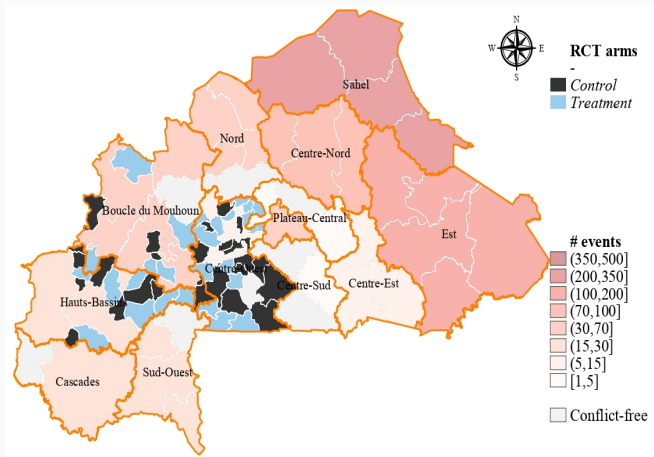
Figure 2: Number of conflict-related events



Data: Objective measurement of conflict exposure

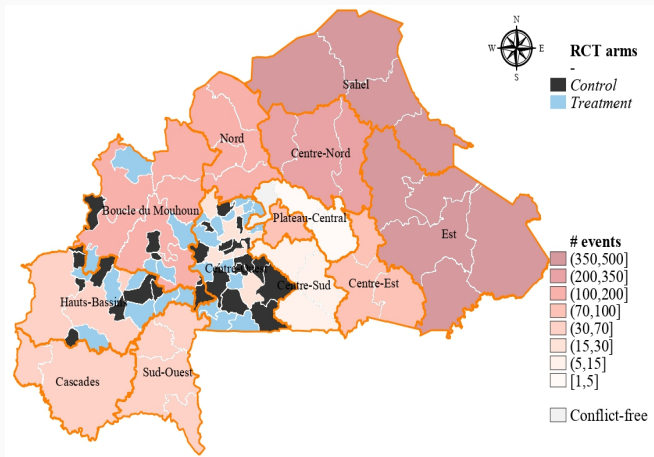
- ACLED Data: 2020, Midline

Figure 2: Number of conflict-related events



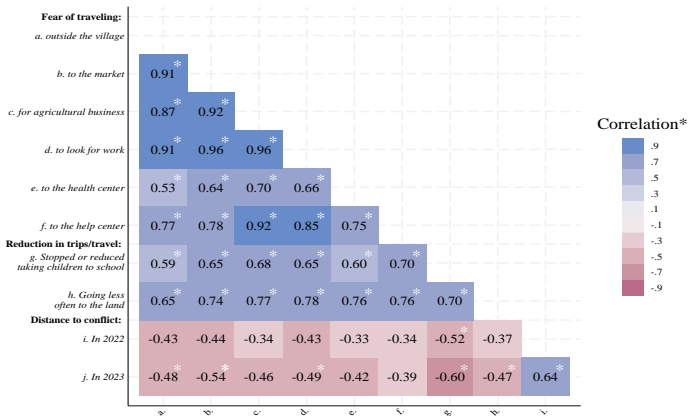
- ACLED Data: 2022, Endline

Figure 2: Number of conflict-related events



- Survey Data: 2022, Endline

Figure 3: Fear of mobility & Distance to conflict hotspots



Note: Stars indicate significance at the 5% level, with p -values adjusted using the Sidak correction. Fear of mobility variables collected for A/B Test (2022-2023).

Data: Targeted population and sample - RCTs

- Phase 1:
 - Households with at least one woman aged 15-35 years who had a child aged 2-4 years living with her, provided that all members consented to participate and did not report plans to move out of the study area within six months of the baseline.
 - This sampling strategy yielded a target baseline sample of 1,800 households across 120 villages in 60 communes.

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- Phase 2:

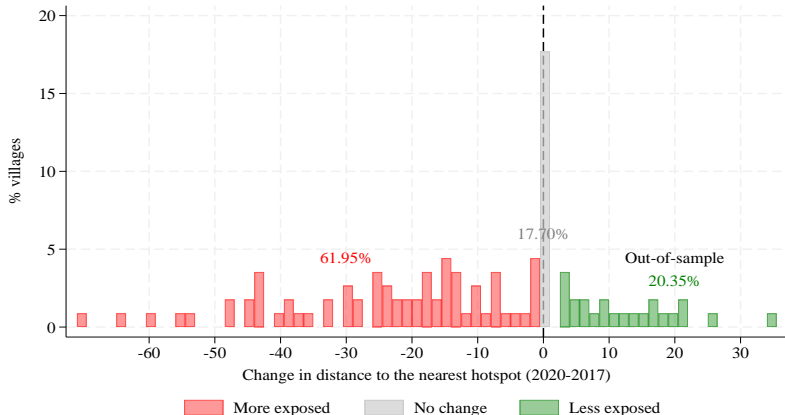
- Phase 1 control communities and included two reference groups: (1) women who participated in the baseline survey and who had resided in the village for at least six months during the A/B Test intervention implementation period; and (2) an additional sample of potential women VSLA members.
- Approximately 2100 households (900 from Phase 1).

Data: Targeted population and sample - Conflict Exposure

Why do we exclude the green?

[Back](#)

Figure 4: Distribution of change in distance to the nearest conflict-hotspot from 2017 to 2020 : (*villages targeted by SELEVER*)



Strategies

Strategy 1: Effects of conflict exposure on empowerment

What are we after here?

→ We begin with a “first-order” question: *to what extent is distance to conflict correlated with our outcomes of interest?*

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What are we after here?

- We begin with a “first-order” question: *to what extent is distance to conflict correlated with our outcomes of interest?*
This only serves as a preliminary descriptive exercise.
- “second-order” question: *how does **increased** proximity to conflict affect women’s empowerment?*
- While the first focuses on simple **correlations**, the second moves toward a **causal interpretation** through a difference-in-differences framework, as detailed below.

Strategy 1: Effects of conflict exposure on empowerment

Baseline specification (First order question)

$$Y_{ivt} = \tau_t + \alpha_v + \beta(-d_{vt}) + \mathbf{C}'_t\gamma + \text{SELEVER}_v \times \text{POST} + \varepsilon_{ivt}, \quad (1)$$

- Y_{ivt} denotes the outcome for individual i in village v at time t ;
- τ_t are time fixed effects; α_v are village fixed effects;
- and d_{vt} is the distance from village v at time t to the nearest conflict event.
- \mathbf{C} represents a set of conflict-related variable other than distance and measuring intensity (*number of events at period t , number fatalities at period t , etc.*).

Note: $-d_{vt}$ represents negative distance - larger values correspond to closer proximity to conflict. β captures the *correlation* between *proximity* to conflict and the outcome. SELEVER is the dummy equal to 1 for treated villages.

Panel unit level of analysis?

Strategy 1: Effects of conflict exposure on empowerment

Continuous difference-in-differences

- As shown in **Stayers**, our setting includes a substantial share of stayers: villages whose distance to the nearest conflict hotspot remained unchanged between the baseline and endline periods.
- Approximately 18% of villages (21 villages, representing roughly 315 households or about 630 respondents) did not experience any change in distance.
- The presence of both stayers and switchers enables us to implement a continuous difference-in-differences design following (de Chaisemartin et al., 2025).

Specifically, the parameter we are after here is as follows:

$$\beta := -E\left(\frac{|d_t - d_{t-1}|}{E(|d_t - d_{t-1}| \mid \Delta d_t^-)} \times \frac{Y_t(-d_t) - Y_t(-d_{t-1})}{d_t - d_{t-1}} \mid \Delta d_t^-\right), \quad (2)$$

where $\Delta d_t^- = 1_{\{\Delta d_t < 0\}}$.

Strategy 2: Protective effects of the RCTs?

Triple difference approach

$$\begin{aligned} Y_{iv} = & \alpha_0 + \alpha_{01}\text{Endline}_t + \alpha_{02}\text{SELEVER}_v + \alpha_{03}\text{ConflictExposure}_{vt} \\ & + \alpha_{12}(\text{ConflictExposure}_{vt} \times \text{SELEVER}_v) + \alpha_{13}(\text{Endline}_t \times \text{SELEVER}_v) \\ & + \alpha_{11}(\text{ConflictExposure}_{vt} \times \text{Endline}_t) \\ & + \beta (\text{ConflictExposure}_{vt} \times \text{Endline}_t \times \text{SELEVER}_v) + \varepsilon_{iv}. \end{aligned} \quad (3)$$

- One of our parameters of interest is β ([Muralidharan and Prakash, 2017](#)), and measures whether SELEVER differentially mitigates the (DiD-identified) conflict effect, and can be seen as the difference of two difference-in-differences ([Olden and Møen, 2022](#)).

Strategy 2: Protective effects of the RCTs?

Triple difference approach (2/2)

→ The OLS estimator of β and α_{11} write as:

$$\begin{aligned} \hat{\beta}_{OLS} &= \overbrace{\left\{ [\bar{Y}_{C=1,S=1,T=1} - \bar{Y}_{C=1,S=1,T=0}] - [\bar{Y}_{C=0,S=1,T=1} - \bar{Y}_{C=0,S=1,T=0}] \right\}}^{DiD^{S=1}: \text{Effect of conflict (C=1) on SELEVER-treatment (S=1) villages}} \\ &\quad - \underbrace{\left\{ [\bar{Y}_{C=1,S=0,T=1} - \bar{Y}_{C=1,S=0,T=0}] - [\bar{Y}_{C=0,S=0,T=1} - \bar{Y}_{C=0,S=0,T=0}] \right\}}_{DiD^{S=0}: \text{Effect of conflict (C=1) on SELEVER-control (S=0) villages}} \\ \hat{\alpha}_{11,OLS} &= [\bar{Y}_{C=1,S=0,T=1} - \bar{Y}_{C=1,S=1,T=0}] - [\bar{Y}_{C=0,S=1,T=1} - \bar{Y}_{C=0,S=0,T=0}] \end{aligned}$$

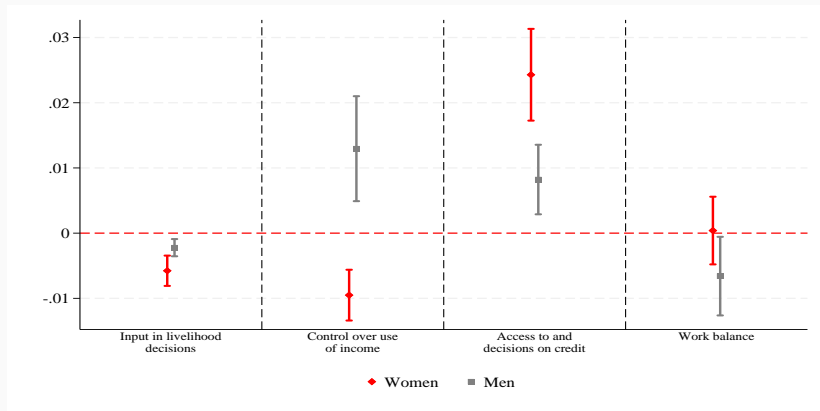
When is a protective effect conclusive?

- If β is not zero, then we know for fact that conflict affects differentially villages regarding the SELEVER group they belong to.
- if $\alpha_{11} < 0$ (as we hypothesize), and $\beta > 0$ then we know that the effect of conflict on SELEVER-treatment group is lower than the effect of conflict on SELEVER-control group.

Results

Results 1 : Effects of conflict on women's empowerment

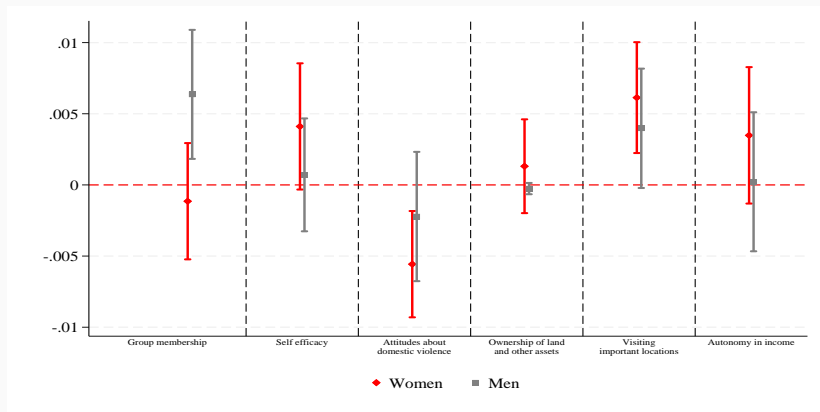
Figure 5: Effects of conflict exposure on empowerment:
(Continuous DiD specification, **Primary outcomes**)



Note: The outcomes presented here are the binary versions, i.e., Empowerment = 1 and Disempowerment = 0.

Effects of conflict on women's empowerment

Figure 6: Results 1 : Effects of conflict exposure on empowerment:
(Continuous DiD specification, **Secondary outcomes**)



Note: The outcomes presented here are the binary versions, i.e., Empowerment = 1 and Disempowerment = 0.

Results 2 : Protective effects of SELEVER

Table 2: SELEVER and conflict exposure on empowerment:
Protective effect diagnostic - (*Primary outcomes*)

	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
	Input in livelihood decision		Control over use of income		Access to and decisions on credit		Work balance	
	Men	Women	Men	Women	Men	Women	Men	Women
Panel A. DiD on SELEVER treatment group sample								
Conflict Exposed×Post	-0.0056 (0.0254)	-0.0068 (0.0503)	-0.0478 (0.0654)	0.0357 (0.0834)	0.0002 (0.0957)	0.0431 (0.0458)	0.1102 (0.0726)	0.0395 (0.0793)
Panel B. DiD on SELEVER control group sample								
Conflict Exposed×Post	-0.0161 (0.0239)	0.0062 (0.0555)	-0.1050* (0.0554)	-0.0966 (0.0911)	0.2184*** (0.0731)	0.0790 (0.0577)	-0.1348** (0.0640)	-0.1629 (0.1001)
Panel C. Triple difference using full sample								
SELEVER × Conflict Exposed × Post	0.0105 (0.0345)	-0.0130 (0.0741)	0.0571 (0.0847)	0.1323 (0.1221)	-0.2182* (0.1190)	-0.0359 (0.0728)	0.2450** (0.0957)	0.2023 (0.1264)
Conflict Exposed×Post	-0.0161 (0.0236)	0.0062 (0.0550)	-0.1050* (0.0548)	-0.0966 (0.0902)	0.2184*** (0.0724)	0.0790 (0.0571)	-0.1348** (0.0634)	-0.1629 (0.0992)
Post=1	0.0151 (0.0189)	-0.0238 (0.0382)	0.0235 (0.0430)	-0.0057 (0.0591)	-0.1423** (0.0602)	-0.0509 (0.0502)	0.0528 (0.0506)	0.0887 (0.0934)
SELEVER × Post	-0.0093 (0.0270)	0.0308 (0.0521)	-0.0560 (0.0593)	-0.0688 (0.0758)	0.1262 (0.0833)	0.0707 (0.0597)	-0.1403** (0.0671)	-0.0962 (0.1080)
Observations	2266	2534	2266	2534	2266	2534	2107	2365
Village FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Secondary here

Results 3 : Conflict exposure and exposure to RCT interventions

Table 3: A/B Test training: Attendance
(Across different levels of conflict exposure)

	(1)	(2)	(3)	(4)
	Distance to the nearest conflict hotspot in 2022			
	First quartile (Q_1) ($< 11\text{km}$)	Inter-quartile	Third quartile (Q_3) $\geq 32\text{km}$	Difference ($Q_1 - Q_3$)
Attended at least one session	0.438	0.489	0.602	-0.164***
Number of attended sessions	1.451	1.778	3.075	-1.624***
Total duration (in hours)	4.429	3.599	10.051	-5.623***

Conclusion & Discussion

Implementation and household dynamics

- (1) Conflict undermined program implementation → Lower participation in SELEVER activities (-16 pp attendance, fewer sessions, fewer training hours).
- (2) Conflict weakened intra-household bargaining power → Reduced control over income and livelihood decisions, alongside higher acceptance of IPV.
- (3) Losses reported by both women and men → Heightened stress and insecurity likely reduce communication and joint decision-making within households.

Why some domains improve and others do not?

- (1) Improved access to credit without empowerment gains → Likely driven by humanitarian and livelihood-focused aid responses.
- (2) Mixed effects on autonomy and collective outcomes → Higher self-efficacy for women and increased men's group participation (e.g. VDP, *Koglweogo*).
- (3) Limited buffering role of SELEVER → Small protective effects only; null impacts in several domains and strong structural constraints ([Leight et al., 2022](#)).

Merci pour votre attention!

Table 4: Balance tests for pre-intervention control variables

	(1)	(2)	(3)	(4)	(5)
	SELEVER Treatment Status				
	Control (N = 60)		Treatment (N = 60)		Difference (C - T)
	A/B Test				
	A (N = 27)	B (N = 28)	A - B		
Panel A. Community characteristics					
<i>Has a market</i>	0.65	0.73	-0.08	0.54	0.11
<i>Population size</i>	1864.97	2018.60	-153.63	1937.00	-72.03
<i>Number of functional boreholes</i>	1.45	1.60	-0.15	2.00	-0.55
<i>Number of functional wells</i>	2.71	3.13	-0.42	3.58	-0.87
<i>Health center presence</i>	0.23	0.20	0.03	0.38	-0.15
<i>Number of female associations</i>	3.61	3.07	0.54	5.12	-1.51
Panel B. Main source of income					
<i>Cereal and tuber crops</i>	0.39	0.40	-0.01	0.38	0.01
<i>Cotton cultivation</i>	0.35	0.47	-0.13	0.33	0.02
<i>Other crops</i>	0.26	0.13	0.13	0.29	-0.03
Panel C. Main agricultural production					
<i>Cotton</i>	0.26	0.40	-0.14	0.29	-0.03
<i>Corn/Millet</i>	0.48	0.33	0.15	0.46	0.03
<i>Sorghum</i>	0.23	0.20	0.03	0.25	-0.02
<i>Other crops</i>	0.03	0.07	-0.04	0.00	0.03

Table 5: Targeted women and men characteristics across RCT arms

	(1)	(2)	(3)	(4)	(5)
	SELEVER Treatment Status				
	Control (N = 1,647)		Treatment (N = 1,666)		<i>Difference (C - T)</i>
	A/B Test				
	A (753)	B (N = 768)	A - B		
<i>Age</i>	38.03	38.60	-0.57	38.35	-0.25
<i>Number of adults in HH</i>	3.39	3.42	-0.03	3.49	-0.13**
<i>Literacy in local language</i>	0.08	0.10	-0.02*	0.10	-0.01
<i>Can speak French</i>	0.16	0.18	-0.02	0.15	0.01
<i>Attended school</i>	0.24	0.23	0.00	0.24	-0.00
<i>Household size</i>	8.85	8.84	0.01	8.81	-0.01
<i>Polygamous household</i>	0.49	0.50	-0.01	0.50	-0.01

Table 6: Characteristics of villages across RCT arms

	SELEVER Treatment Status		
	Control (N = 60)	Treatment (N = 60)	Difference (C - T)
Panel A. Distances (km), and diversity			
<i>Distance to nearest police station</i>	20.100	19.930	0.170
<i>Distance to nearest power supply</i>	9.420	8.320	1.090
<i>Distance to nearest asphalt road</i>	20.000	22.690	-2.690
<i>SDIa (language)</i>	0.410	0.380	0.040
<i>SDI (religion)</i>	0.480	0.560	-0.070
<i>SDI (ethnicity)</i>	0.400	0.410	-0.010
Panel B. Mobility and migration			
<i>Internal public transportation</i>	0.180	0.290	-0.100
<i>External public transportation</i>	0.850	0.800	0.050
<i>Asphalt road</i>	0.130	0.170	-0.040
<i>Inflowb</i>	0.570	0.690	-0.130
Panel C. Security and conflict			
<i>Presence of police</i>	0.570	0.690	-0.130
<i>Presence of army</i>	0.330	0.370	-0.040
<i>Police/army intervention (last 5 years)</i>	0.450	0.440	0.010
<i>Presence of armed group</i>	0.400	0.460	-0.060
<i>Any pastoralist-farmer conflict</i>	0.580	0.640	-0.060

Table 7: Conflict-related events across RCT arms
(Objective conflict exposure measurements)

	(1)	(2)	(3)	(4)	(5)
	SELEVER Treatment Status				
	Control (N = 60)		Treatment (N = 60)		Difference (C - T)
	A/B Test				
	A (N = 27)	B (N = 28)	A - B		
Panel A. Distance to conflict (km)					
Distance to conflict (Any)	14.458	12.987	1.470	16.156	-2.611
Distance to conflict (Battles)	24.940	23.020	1.920	24.587	-1.416
Distance to conflict (Riots)	66.178	64.778	1.400	67.665	2.313
Distance to conflict (Protests)	41.970	39.757	2.213	43.932	-2.508
Distance to conflict (Civilians)	24.435	23.793	0.641	26.583	-3.584
Distance to conflict (Fatal)	17.458	18.345	-0.887	20.450	-3.184
Distance to conflict (+10 deads)	43.821	53.458	-9.638	43.921	1.962
Panel B. Number of conflict-related events					
In 2022	0.857	0.769	0.088	0.533	0.500
In 2020	0.000	0.077	-0.077	0.067	0.267
In 2017	0.000	0.231	-0.231	0.033	0.100
Panel C. Number of fatalities					
In 2022	1.357	0.231	1.126	0.167	1.067
In 2020	0.000	0.000	0.000	0.067	0.800
In 2017	0.000	0.308	-0.308	0.000	0.200

Figure 7: Number of conflict-related events over time
(In Burkina Faso & SELEVER targets regions)

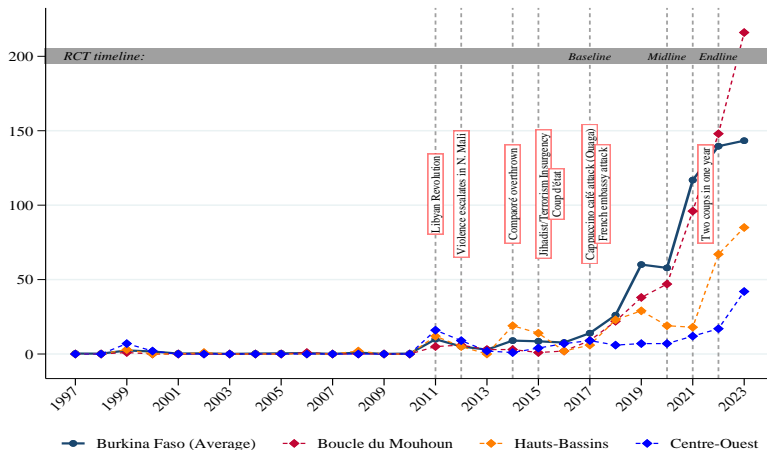
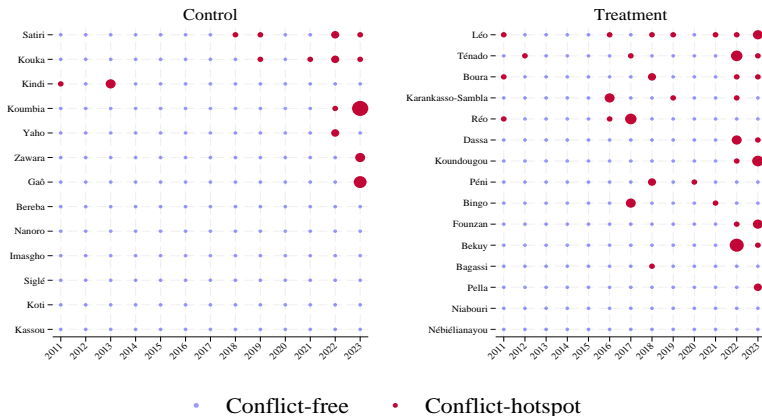


Figure 8: Distribution of conflict-related events over across communes
(Communes targeted for A/B Test)



Protective effects of SELEVER

Table 8: SELEVER and conflict exposure on empowerment:
Protective effect diagnostic - (*Secondary outcomes*)

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

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Formally, the HHI is defined as follows:

$$\text{HHI}_i = \sum_{g=1}^{G_i} s_{ig}^2, \quad (4)$$

where G_i denotes the number of groups (e.g., industries, religions, ethnicities, or languages) in area i (e.g., market, country, or village), and s_{ig} corresponds to the share of group g in area i . The maximum value of the HHI is 1 (or 10,000 if shares are expressed in percentages), corresponding to full concentration. If groups are equally sized (i.e., each group has the same share), the HHI equals $\frac{1}{G_i}$.

The standardized diversity index (SDI) is then defined as:

$$\text{SDI}_i = \frac{G_i}{G_i - 1} (1 - \text{HHI}_i). \quad (5)$$

0 corresponds to no diversity (since $\text{HHI}_i = 1$ when there is only one group) and 1 corresponds to maximal diversity (when all groups are of equal size).

For example, from the religious (respectively, linguistic) perspective, if a village is composed of 50% Muslims and 50% Christians (respectively, 50% Moore and 50% Dioula speakers), the index equals 1.

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