





Are Conflicts making us hungry? Evidence from Farmer-Herdsmen conflicts in Rural Nigeria.

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Thesis Structure





Background and Motivation

- Climate change and population increase
- Competition over scarce resources
- Farmer-herdsmen conflict





Related Literature

Resource-use Conflict and Food Security

Authors	Country	Type of Conflict	Findings
Arias et al. (2018)	Columbia	Armed Conflict	violent conflicts subsistence farming. uncertainty lower investment, short term yield & lower profitability
Adelaja & George (2019)	Nigeria	Armed Conflict	Conflict reduces total output and productivity but not land use, reduced hours of hired labour but not family labour
Brück & Schindler (2009)	Developing Countries	Armed Conflict	Strong impact on intra-household relations and gender roles. Vulnerability among women
D'Souza & Jolliffe (2013)	Afghanistan	Armed Conflict	Conflict influences how food prices affect household food security.
Bruck et al. (2018)	Gaza Strip	Armed Conflict	Conflict had an direct effect on household resilience and not food security.

Essay 1

Lack of understanding of the dynamics of F_H resource –use conflicts and how it influences rural household decisions.

To our knowledge, this is the first study to *quantify* the impact F-H conflict on the food security of *farmers*.

Research Question

To what extent does the incidence and severity of farmer-herdsmen conflicts affect the food security of rural households in Nigeria?

Theoretical Model

An agricultural household model with resource-use conflict

Max U = U(G,L;H)

Subject to:

Production technology constraint $Q = Q[X(\tau), L_F, F, H, \theta, \theta, R]$

Time constraint $T = L_F + L_N + L$

Income constraint $P_c C = P_Q Q - P_X X + W L_N + V$

- G = consumption of goods
- L = leisure
- H = location, household and individual characteristics.
- X= purchased agricultural inputs (pesticides, fertilizer, seeds)
- τ = risk perception of conflict
- T =total household time endowment
- *F* = household time endowment for farm work
- N = household time endowment for off-farm work
- $\star \theta_i$ = incidence of farmer-herdsmen conflict
- $\star \theta_s$ = severity of farmer-herdsmen conflict
 - R = vector of exogenous factors that influence the production

function.

W = wage rate

V= other income sources

Theoretical Model Contd.

Technology-controlled measure of household income:

 $\begin{aligned} P_{c}C &= P_{Q}Q[X(\tau), L_{F}, F, H, \theta_{i}, \theta_{s}R] - P_{X}X + \\ WL_{N} + V \end{aligned}$

The Lagrangian expression is:

$$\begin{aligned} \mathcal{L} \\ &= U(G,L;H) + \lambda [P_Q Q[X(\tau),L_F,F,H,\theta_i,\theta_s R] \\ &- P_X X + W L_N + V - P_c C] + \mu \left(T - L_F + L_N \right. \\ &+ L) \end{aligned}$$

Propositions

- 1. Marginal change to production as a result of incidence of farmer-herdsmen conflict is negative, $dQ/d\theta_i < 0$.
- 2. Marginal change to production as a result of severity of farmer-herdsmen conflict is negative, $dQ/d\theta_s < 0$



Empirical Specification

> To account for endogeneity bias: Two Stage Residual Inclusion

(2SRI) Approach

First stage: Conflict_i= $\alpha_1 + \alpha_2 I_i + \alpha_3 x_i + u_i$ Second stage: FS_i= $\beta_1 + \beta_2$ Conflict_i + $\beta_3 x_i + \beta_4 Res_i + \varepsilon_i$

Asymptotically Correct Standard Errors [ACSE] (Terza, 2018)

Conditional Mixed Process (CMP) Systems Approach
 Robustness check



Study Area and Data



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- Multi-stage sampling technique
- Zone; State; Local Government Area (LGA); Towns; Villages;







Table 1: Definition and summary statistics of key variables

Variable	Variable description	Mean	SD	Min	Max
Food insecurity					
HFIAS	Household Food Insecurity Access Scale	11.27	6.33	0	27
CSI	Coping Strategies Index	22.12	19.77	0	93
Conflict					
Incidence of F-H conflict	Number of farmer-herdsmen conflicts in the community in the last year	3.95	6.20	0	28
Severity of F-H conflict	Index of the severity of farmer-herdsmen conflicts	0.44	0.33	0	1
Instruments					
Distance to police station	Distance from household to the closest police station in km	7.87	8.65	0.2	40
Private means of protecting hh	Private means of protecting household (1=yes, 0 otherwise)	0.55	0.50	0	1

Table 2: Definition and summary statistics of independent variables

Variable	Variable description	Mean	SD
Age	Age of household head (years)	49.43	14.46
Gender (1=female)	1 if household head is female, 0 otherwise	0.24	0.43
Education (years)	Education of household head (years)	8.64	5.18
Farming experience	Household head's years of farming	26.83	15.25
Household size	No of household members	9.44	8.82
Asset ownership index	Household asset ownership index	0.22	0.21
Total cultivated land	Total area of cultivated farmland (acres)	3.86	3.85
Farm income	Log of household's total farm income	0	13.31
Off farm income	Log of household's total off-farm income	0	13.01
Perceived road quality	Household head's assessment of road quality (1=good condition, 0=not good condition)	0.25	0.43
Cultivation	Number of crops cultivated by household	7.52	3.15
Fertilizer use	1 if household uses fertilizer, 0 otherwise	0.75	0.43
Land Tenure	Bundle of property rights on their largest farmland	10.47	2.45

Table 3: Estimation results for incidence of conflict

Variable	2SRI (ACSE)		2SRI (bootstrap)				
	HFIAS	CS	I	HFI	۹S	CSI	
Incidence of F-H Conflict	1.017 (0.188) 1.067 (0.100)		1.017 (0.022)		1.067 (0.045)		
Controls	Yes	Yes Yes		Yes		Yes	
Residuals	-0.995 (0.186)	-0.954 (0.100)		-0.995 (0.023)		-0.954 (0.047)	
Constant	16.508 (1.987)***	32.574 (0.984)***		16.508 (0.297)***		32.574 (0.478)***	
First stage							
Dis. hh to Police station			0.010	(0.010)			
Wald test (Prob>chi2)			0.91 (0.340)			
Wald test	0.68	1.97		0.68		1.97	
Obs	401	401		401		401	
Reps				300	0	3000	

Note: *, **, *** represent significance at 10%, 5%, and 1% levels, respectively; SE in parenthesis

Table 4: Estimation results for severity of conflict

Variable	2SRI (/	ACSE)	2SRI (bootstrap)		
	HFIAS	CSI	HFIAS	CSI	
Severity of F-H Conflict	7.95 (0.529)***	72.95 (0.852)***	7.95 (0.633)***	72.95 (1.321)***	
Controls	Yes	Yes	Yes	Yes	
Residuals	-0.194(0.521)***	-0.023 (0.832)***	-0.194 (0.621)***	-0.023 (1.305)***	
Constant	7.356 (0.337)***	6.466 (0.553)***	7.356 (0.426)***	6.466 (0.890)	
First stage					
PP household	-0.239 (0.078)***				
Wald test (Prob>chi2)	9.40 (0.0		01)***		
Wald test	17.00***	25.35***	17.00***	25.35***	
Obs	401	401	401	401	
Reps			3000	3000	

Note: *, **, *** represent significance at 10%, 5%, and 1% levels, respectively: SE in parenthesis

Table 5 : Robustness check using the conditional mixed process (CMP) approach

Variable	Incidence of	F-H Conflict	Severity of I	-H Conflict
	HFIAS	CSI	HFIAS	CSI
Food security				
Incidence of F-H Conflict	1.648(1.000)*	4.465(2.805)		
Severity of F-H Conflict			5.172(0.828)***	13.57(2.578)***
First stage				
Distance to police station	0.0748(0.046)**	0.0748(0.046)**		
Private means of protecting household			-0.471(0.140)***	- 0.486(0.144)***
Insig_1	2.305(0.474)***	3.363(0.432)***	1.715(0.033)***	2.913(0.04)***
Insig_2	1.719(0.060)***	1.719(0.060)***		
atanhrho_12	-1.171(0.575)**	-1.015(0.558)*	-0.0473(0.027)*	-0.070(0.032)**
Ν	401	401	401	401

Note: *, **, *** represent significance at 10%, 5%, and 1% levels,

Policy interventions like the provision of immediate safety nets, like food aids, to households in severely affected conflict regions.

Encourage more sustainable herding practises to curb the likelihood of F-H clashes in the future.



Next Steps

Construction of a risk perception index

Risk ranking – scale (Doss, McPeak and Barrett, 2008)
Principal component analysis

□ Production decisions like investment in input, fertilizer and pesticide use etc.

□Still Ongoing



Additional Suggestions and Comments?

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