Rice Mill Clusters and Resilience to Conflict Shock

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Introduction

- Agricultural clusters, a group of interconnected firms located in a particular location, could play a role in mitigating the effects of conflict shock by facilitating cooperation and risk-sharing mechanisms among firms during economic downturns.
- However, the literature on how clusters play a role in firms' resiliency of firms during the conflict shock is quite limited.
- This study assesses the role or rice mill clusters on the mill's capacity to resist conflict shock and identify the role of collaboration and several other cluster attributes (i.e., access to market and the flow of information) in affecting resilience.

Data

- **Rice Miller Survey**: This survey comprises 10 rounds collected via phone during the active conflicts between 2020-2023.
- **Armed Conflict Location & Event Data Project (ACLED) Dataset**: Violent conflict occurring in 2 months prior to the survey month within 50 km radii of the village tract

Key Contributions

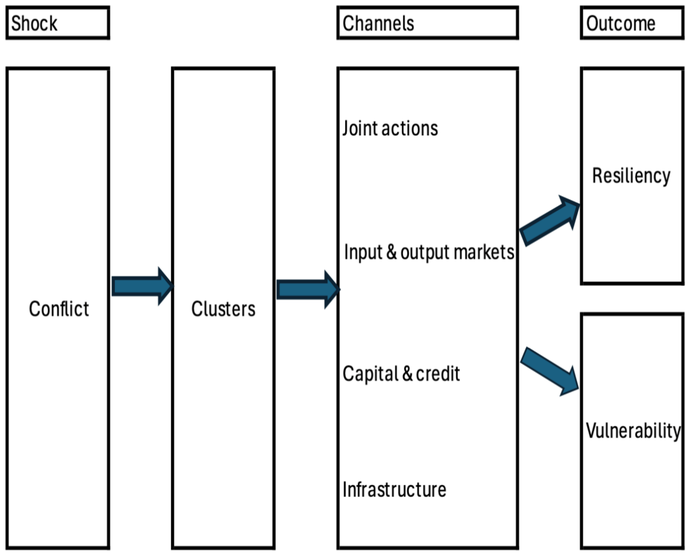
- Provide empirical evidence on the impact of conflict at the firm level.
- Contribute a growing literature on the role of clusters in firms' resiliency to the economic shock in the context of developing countries
- Provide critical insights into the policy debate on agricultural value chain development in fragile states using the evidence from longitudinal data

Identification Strategy

$$y_{ijkdt} = \beta\Omega + \delta c_{jkdt} + \theta m_{jkd} + \phi_k + \phi_t + \phi_d t + \varepsilon_{ijkdt}$$

- where i denotes the mill, j denotes the village tract, k denotes the township, d denotes the district, and t denotes the survey round.
- The key explanatory variables are Ω, c_{jkdt}, and m_{jkd}
- y_{ijkdt} = whether the mill was was temporarily closed in the survey round, whether the mill purchased paddy/sold rice in the last 30 days, and total rice produced (tons), total operation hours, and production markup
- c_{jkdt} =conflict variable
- m_{jkd} = cluster indicator (defined a high cluster if the village tract has a total number of rice mills higher than the median number)
- Ω = interaction term between c_{jkdt} and m_{jkd}. Thus, it captures the differential effects of conflicts by type of clustering.
- To mitigate the omitted variable bias, we additionally control for township fixed effects ϕ_k, survey round fixed effects ϕ_t, and a vector of district-specific time trends $\phi_d t$, where ϕ_d is a set of district fixed effects and t is a continuous time variable.

Figure 1: Conceptual Map



Source: Authors

Preliminary Findings

Table 2: Conflict-related Challenges Experienced by Rice Mills by Cluster Type

Dependent Variable:	difficulties repaying or receiving loans	difficulties with transportation access	difficulties buying paddy	difficulties selling rice	difficulties accessing labor	difficulties getting information	difficulties with high transportation cost	difficulties having electricity access	difficulties having access to fuel	difficulties with fuel cost
cluster	-0.06	-0.06***	-0.01	-0.01	-0.00	-0.01	-0.07**	0.01	-0.02	-0.07
	(0.04)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.05)	(0.06)	(0.05)
conflict	-0.02	0.05	-0.04	-0.09	0.03	-0.05	0.29***	-0.24	-0.19	-0.37
	(0.06)	(0.17)	(0.09)	(0.06)	(0.05)	(0.12)	(0.10)	(0.28)	(0.35)	(0.27)
cluster#conflict	0.11	0.64**	0.54**	0.73***	-0.24**	-0.01	0.66***	0.02	0.84***	0.86**
	(0.11)	(0.32)	(0.23)	(0.22)	(0.10)	(0.09)	(0.21)	(0.35)	(0.31)	(0.35)
Observations	2,034	2,034	1,627	1,627	1,627	1,627	1,627	963	963	963
Adjusted R-squared	0.14	0.18	0.26	0.30	0.01	0.23	0.12	0.23	0.15	0.17
Available round	All	All	Rd3-10	Rd3-10	Rd3-10	Rd3-10	Rd3-10	Rd7-10	Rd7-10	Rd7-10

Table 2: Estimated Effects of Conflict on Operational Status & Profitability by Cluster Type

Dependent Variable:	open	temporarily closed	purchased paddy or sold rice	operation hours	paddy purchased price (log)	rice selling price (log)	markup (log)
cluster	0.02	-0.03	0.03	8.88	0.02	0.02	0.01
	(0.04)	(0.04)	(0.04)	(9.41)	(0.01)	(0.01)	(0.02)
conflict	-0.12**	0.11*	0.17	72.03*	0.06	0.07	-0.01
	(0.06)	(0.07)	(0.21)	(41.89)	(0.06)	(0.09)	(0.33)
cluster#conflict	-0.20	0.24*	-0.12	-23.87	-0.17	-0.16	-0.04
	(0.13)	(0.13)	(0.20)	(55.66)	(0.17)	(0.18)	(0.43)
Observations	2,571	2,571	1,819	1,629	1,100	1,100	1,100
Adjusted R-squared	0.10	0.11	0.11	.	0.93	0.92	0.66
Available rounds	All	All	Rd2-10	Rd1-5, & 10	Rd2-10	Rd2-10	Rd2-10

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