Political Instability and Undernourishment: Nepal's Decade-Long Insurgency

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Political Instability and Undernourishment

Nepal's Decade-Long Insurgency

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Motivation

- In the last two decades, the prevalence of undernourishment declined from 12.4 to 8.4% of the global population, but increased to 10.5% in 2021 mostly due to COVID (The Status of Food Security and Nutrition in the World, SOFI, 2022)

- Major setbacks have occurred spatially and temporally in the presence of political instability, e.g. internal strifes or conflicts with immediate neighbors
  - Violent conflicts brought protracted food crises in south and west Asia, Central America and Africa (Messer and Cohen, 2004; D'Souza and Jolliffe, 2013; Segovia, 2017; Brück et al., 2019; Lacoella and Tirivayi, 2020)

- Political conflict – often noted as a primary cause of undernourishment - detrimental to food production, trade, marketing, and consumption directly or via changes in the purchasing power

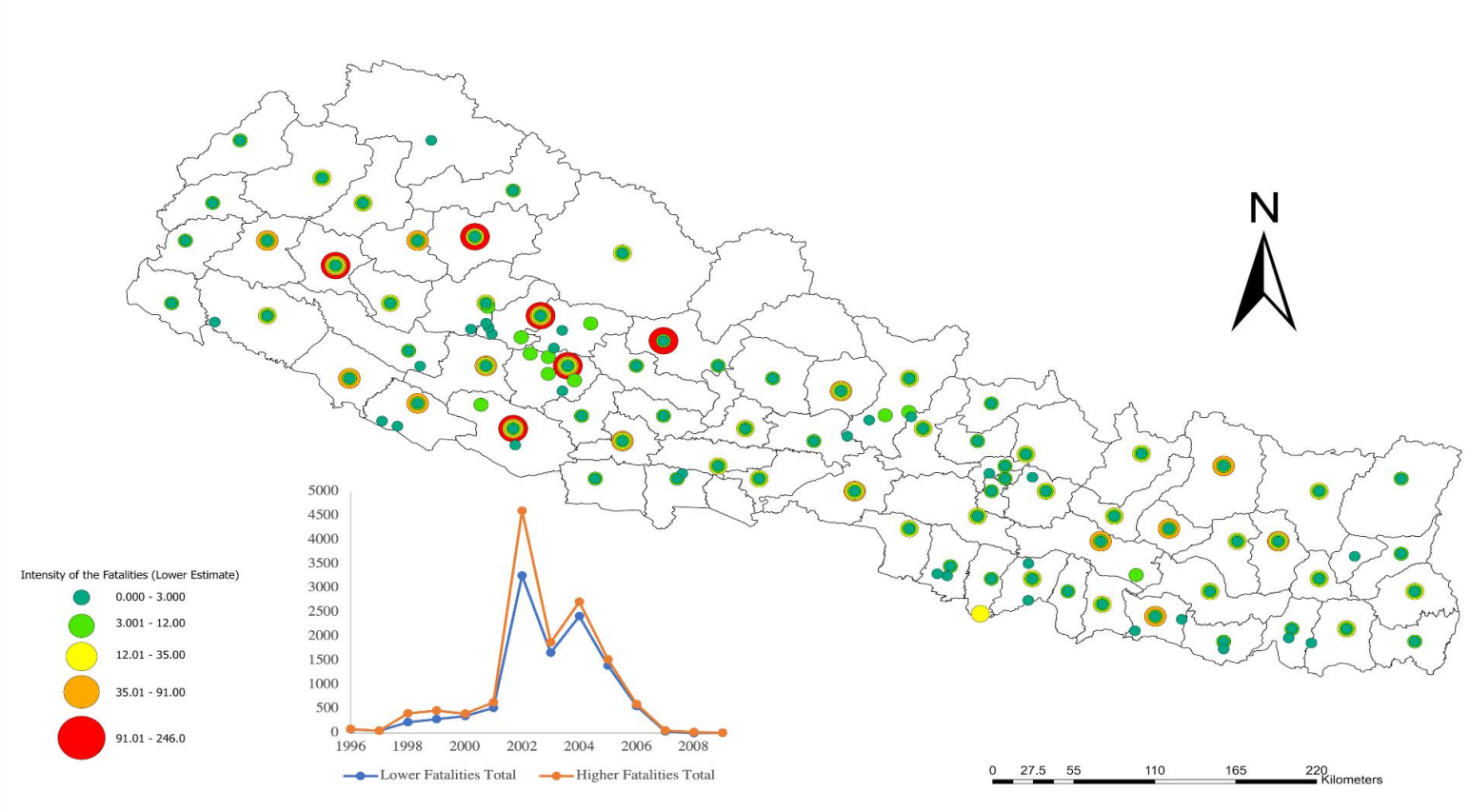
- Most studies focus on household factors affecting undernourishment as well as other pillars of food security; some pay attention to community and regional characteristics, but only a few have explored the impact of quality and stability of institutions

Motivation

- Sen (1981) argued that food security can be best achieved through a functioning democracy facing elections and criticisms, which requires stable politics with an inclusive growth strategy
- The key question we pose: how does political instability affect undernourishment?
- Case: Nepal's insurgency (1996-2006): Communist Party of Nepal (CPN)-Maoist rebellion
- Why Nepal? An interesting case with data availability
  - High prevalence of undernourishment and large variability in measuring it: 6, 17, 28, and 41% according to FAO, USAID-DHS, UNDP, and the Government of Nepal (GON) for 2016, respectively (Poudel and Gopinath, 2021)
  - HH-level data, before (1995), during (2003), and after (2011) insurgency collected by the Government, and with permission from Maoists in some districts
- Implications for institutional quality and stability in regions facing or likely to face conflicts

Context: Insurgency (1996-2006)

- Violent Maoist insurgency (*aka* people's war) aimed to bring democratic opportunities to citizens, reduce existing inequalities and abolish the constitutional monarchy (Bohara et al., 2006; Sharma, 2006)
- Maoist rebellion began in February 1996 near the mid-and far-western region, and later extended throughout the country within a few years, causing widespread revolt, fatalities and destruction



Map of Nepal showing regions affected by Maoist insurgency; Authors

Context: Insurgency (1996-2006)

- Period of high political instability
  - Changes in government leadership (prime minister and council of ministers) every year
  - Royal family massacre 2001
  - Drastic administrative transition from the Kingdom of Nepal to the Federal Democratic Republic of Nepal after 2006, popularly termed as "People's Movement"
  - Constituent Assembly Election in 2008 and formal declaration abolishing the 240-year old monarchy (Nepal-Ministry of Foreign Affairs, 2021)

- Estimated people killed: 1,507 to 2,039 (before 2002) but increased to nearly 9,340 to 11,405 by the time insurgency ended in 2006; displaced 200,000 lives; series of executions, purges, kidnappings, rallies, protests, and bombings

- Severe pain inflicted by insurgents on ordinary citizens (France-Presse, *NYT*, 2005; Murshed and Gates, 2005; Vaughn, 2006; USAID, 2007; UN Human Rights - Office of the High Commissioner, OHCHR, 2012).

Methods

- **Two-level random intercept logit model with instrument:**

$$log\left(\frac{p_{hc}}{1-p_{hc}}\right) = \beta_0 + \gamma_I \widehat{Insurgency_c} + \sum_{l=1}^{L} \alpha_{lc} X_{lhc} + \sum_{m=1}^{M} \gamma_m X_{mc} + \mu_c + \varepsilon_{hc}$$

$$Insurgency_c = \omega_0 + \theta_c \overline{Rainfall}_{t-2\ to\ t-5} + \sum_{l=1}^{L} \alpha_{lc} X_{lhc} + \sum_{m=1}^{M} \gamma_m X_{mc} + \zeta_{hc}$$

Household (HH) is undernourished (=1) or otherwise (=0); where, p_{hc}= Pr ($Undernourished_{hc}$=1)

'h': HH and 'c': community

X_h: HH Size, HH Children, HH Head Education, Ethinicity (Brahmin/Chhetri/Newar), HH Female Head, Production Diversity, Occupation: Ag, HH Landholding, Durable Asset Quantile, Remittance, Radio Use

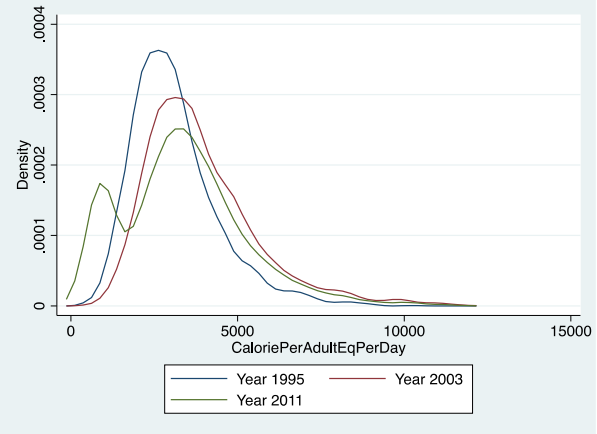
X_c: Share of Piped Water HHs, Distance to Market, Urbanization

- **Least Absolute Shrinkage and Selection Operator:** To avoid collinearities or dependencies among and within X_l and X_m, and reduce the dimensionality

(Smith and Shively, 2019; Kumar et al., 2020; Miguel, Satyanath and Sergenti, 2004; Sarsons, 2015)

Data: Living Standards, Fatalities, Other Controls

- Household Data: Nepal Living Standard Survey – 1995 (no insurgency), 2003 (near-peak), and 2011 (post-insurgency)
- Fatalities: Uppsala Conflict Data Program (1996-2009), Uppsala University
- HH Calorie Difference or Consumption Level = Calorie Consumed – Calorie Required (FAO, 2008)
- $$Prevalence\ of\ Undernourishment\ (POU) = \begin{cases} 1\ (undernourished),\ Calorie\ Difference\ < 0 \\ 0\ (otherwise),\ Calorie\ Difference \geq 0 \end{cases}$$
- Monthly historical rainfall: NASA, Earth Data (2023) via *Open Data Nepal*



Distribution of calorie consumption over time (1995-2011); Authors

Results

	Overall (1995-2011)				2003		2011	
	Without Instrument		With Instrument		With Instrument		With Instrument	
Variables	Odds Ratio	Marginal Effects	Odds Ratio	Marginal Effects	Odds Ratio	Marginal Effects	Odds Ratio	Marginal Effects
Insurgency	1.002 (0.002)	0.0005						
$\widehat{\text{Insurgency}}$			1.059*** (0.012)	0.012	1.173*** (0.049)	0.028	1.056*** (0.019)	0.013
N (Total HHs)	13008		13008		3886		5785	
Groups (Total Community)	1083		1083		325		484	
Interclass Correlation	0.134		0.132		0.166		0.046	
LR test for HH Variables	591.43***		582.15***		370.93***		170.78***	
LR test for Community Variables	37.87***		26.13***		25.13***		17.30***	
LR test for Interactions of HH and Community	29.98***		27.95***		3.3		29.99***	
Time Fixed Effects	90.47***		110.33***		9.45***		1.04	

(Not a complete table)

Urban and Market Distance (instrumented)

	Overall	1995	2003	2011
Variables	Marginal Effects	Marginal Effects	Marginal Effects	Marginal Effects
Urban	0.067***	0.713***	0.231**	-0.364**
Ln (distance to market)	-0.041***	0.027*	-0.206***	-0.037***
N	13008			

Results

Robustness Check:
Two level random intercept
Linear model
Outcome: HH Consumption Level

	Overall (1995-2011)				1995		2003		2011	
Variables	Coefficient	Marginal Effects	Coefficient	Marginal Effects	Coefficient	Marginal Effects	Coefficient	Marginal Effects	Coefficient	Marginal Effects
Insurgency	-3.027**	-3.027								
	(1.502)									
$\widehat{\text{Insurgency}}$			-33.051***	-33.051			-90.007***	-90.00691	-56.969***	-56.9688
			(7.395)				(16.234)		(12.605)	
Urban	-1389.032***	358.303	-1468.456***	267.715	-4766.08***	-1774.920	-1746.13***	-1082.52	581.995	1751.789
	(397.618)		(328.277)		(812.128)		(558.880)		(489.926)	
Ln (distance to market)	547.712***	170.478	571.662***	193.432	445.279***	-171.375	784.589***	666.9075	761.855***	246.0431
	(88.884)		(68.238)		(144.719)		(127.370)		(140.523)	
N	13008		13008		3337		3886		5785	

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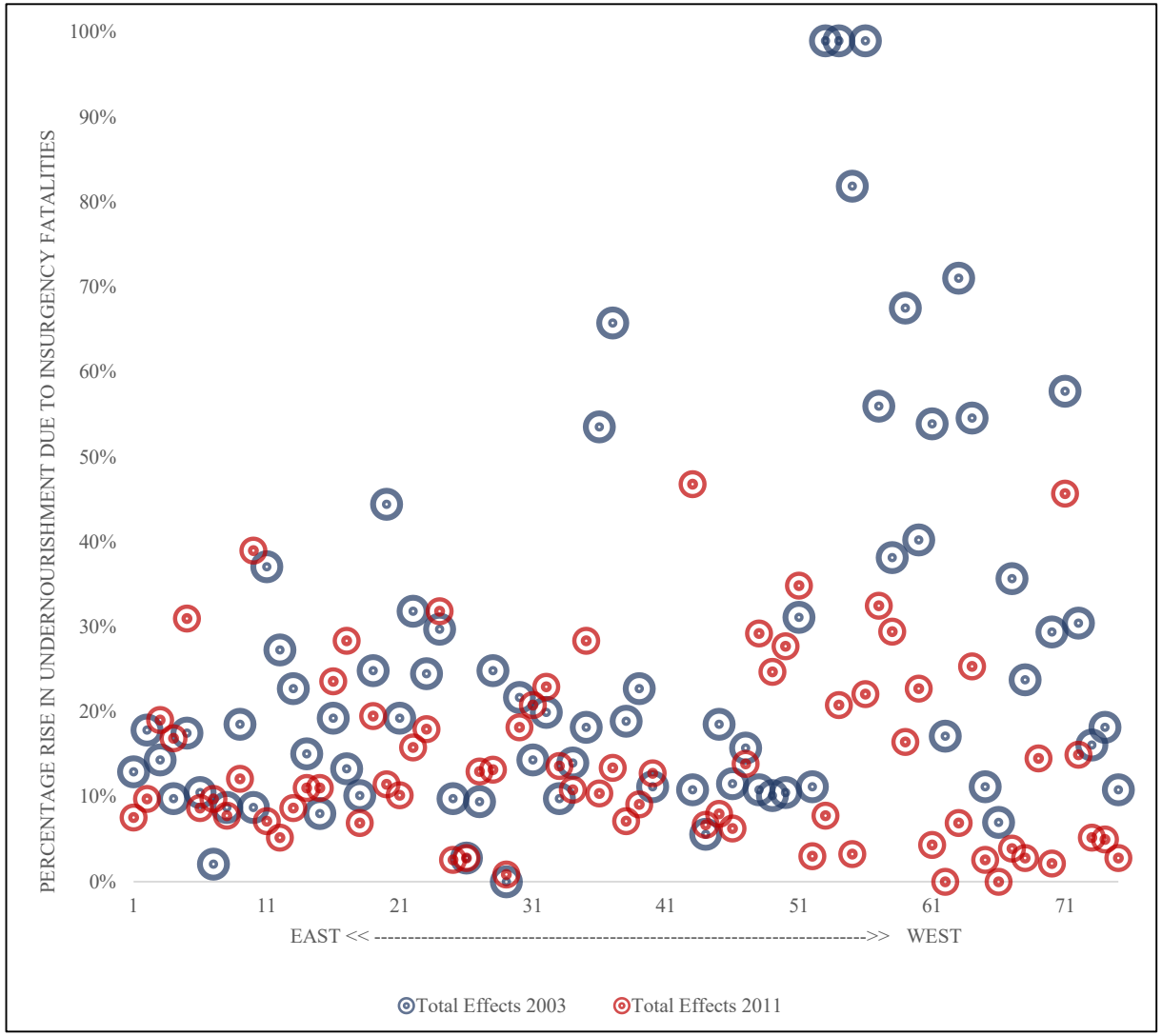
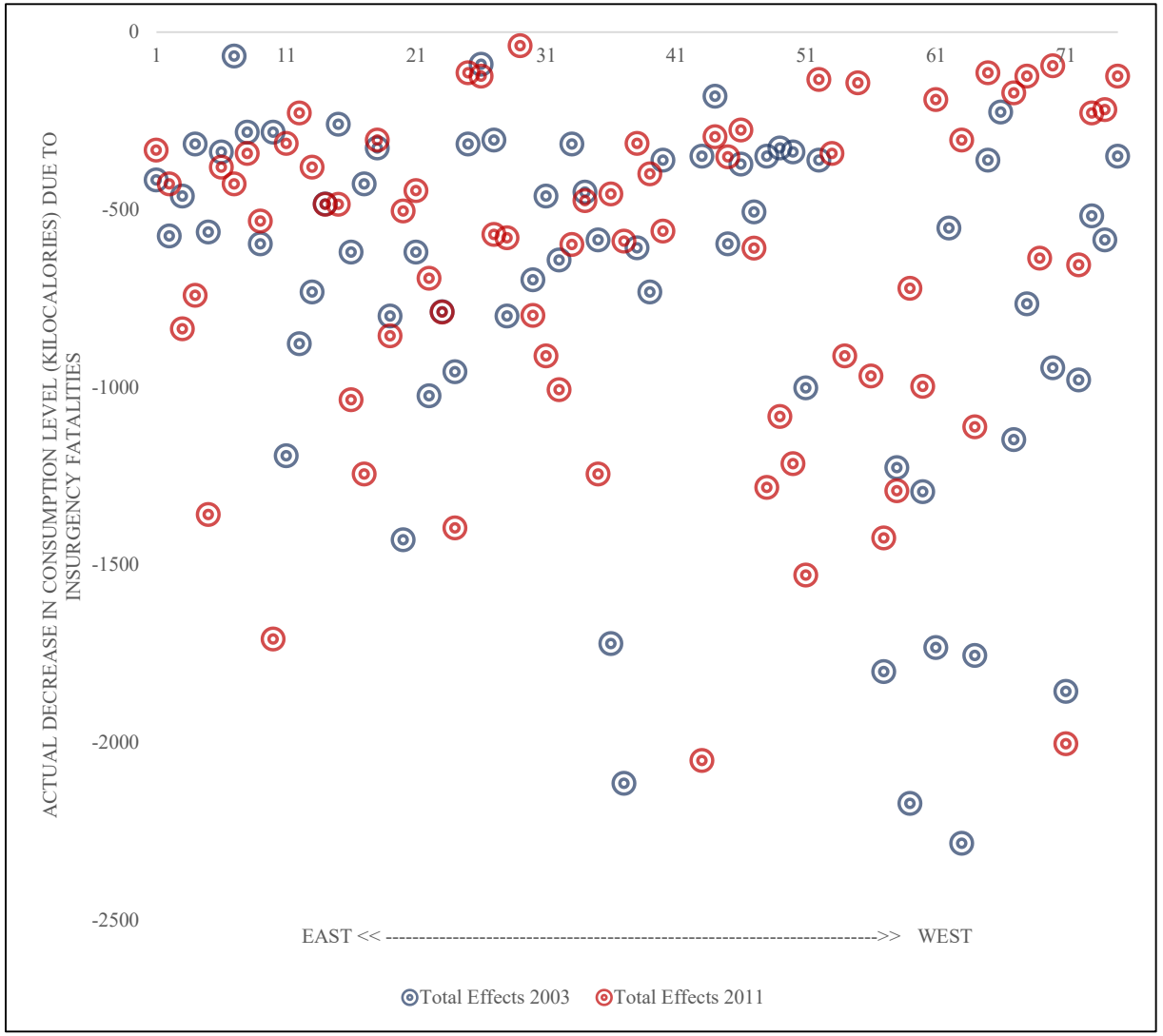
Results


100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
PERCENTAGE RISE IN UNDERNOURISHMENT DUE TO INSURGENCY FATALITIES
1
11
21
31
41
51
61
71
EAST << ---------->> WEST
Total Effects 2003
Total Effects 2011


0
-500
-1000
-1500
-2000
-2500
ACTUAL DECREASE IN CONSUMPTION LEVEL (KILOCALORIES) DUE TO INSURGENCY FATALITIES
1
11
21
31
41
51
61
71
EAST << ---------->> WEST
Total Effects 2003
Total Effects 2011

Discussion

- Maoist insurgency, a period of unstable politics in Nepal, increased the average probability of undernourishment by 27 and 15 percent in 2003 and 2011, respectively

- Alternatively, insurgency decreased average HH consumption levels by 977 and 656 kilocalories during 2003 and 2011, respectively

- Traditional HH factors like size, wealth, production diversity, and education remained critical to achieving food security

- Community infrastructure including market and urban facilities also lowered undernourishment, but distance to a market center may have been a blessing in times of violent conflicts.

Thank you!

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