War, Conflict and Food Security

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Sustainable Development Goals (SDG)

- SDG2: “hunger & food security”
  - "End hunger, achieve food security and improved nutrition and promote sustainable agriculture."
- SDG16: “peace”
  - "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.“
- SDG3: “healthy life & well-being”
  - "Ensure healthy lives and promote well-being for all at all ages.”

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Links btw armed conflict and food insecurity

- Armed conflict is one of the drivers of food insecurity
  - (FAO et al., 2021)
- Often an armed conflict is a complex emergency, as a country or a region may be experiencing multiple forms of armed conflict at the same time.
- 78.7% of the world's 155 million of stunted children, and more than 50% of undernourished people live in conflict affected countries
  - (FAO 2017, 2021) .
- A circular relationship, as food insecurity is also linked to poverty

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Varied definitions of conflict

- The studies on the subject considered
  - the effects of international and civil wars
  - minor (25-999 battle deaths) and major conflicts (1,000 battle deaths)
  - national and subnational insurgencies
  - genocide
  - political repression
  - riots and protests
  - gang violence
- A separate literature focuses on inter-personal conflict such as crime and this review does not focus on it.

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UCDP-PRIO definitions of conflict & use

- An armed conflict:
  - "An **armed conflict** is a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths in one calendar year" (UCDP-PRIO)
- A major conflict year:
  - "A **state-based conflict** or dyad which reaches at least 1000 battle-related deaths in a specific calendar year."
- A *minor conflict year*
  - is a year with at least 25 and up to 999 battle-related deaths.

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ACLED data

- ACLED collects and codes reported information on *developing world political violence*, with a focus
  - on civil and communal conflicts, violence against civilians, remote violence, rioting and protesting
- ACLED covers *violent activity* that occurs *both within and outside the context of a civil war*, particularly violence against civilians, militia interactions, communal conflict and rioting.

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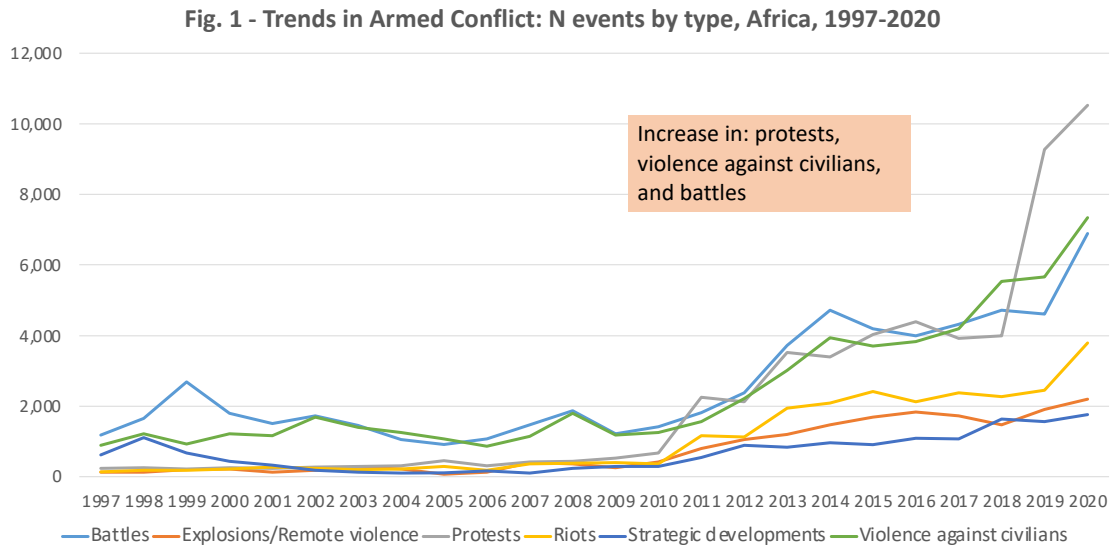

Source: ACLED (Accessed: Sept. 2021.)

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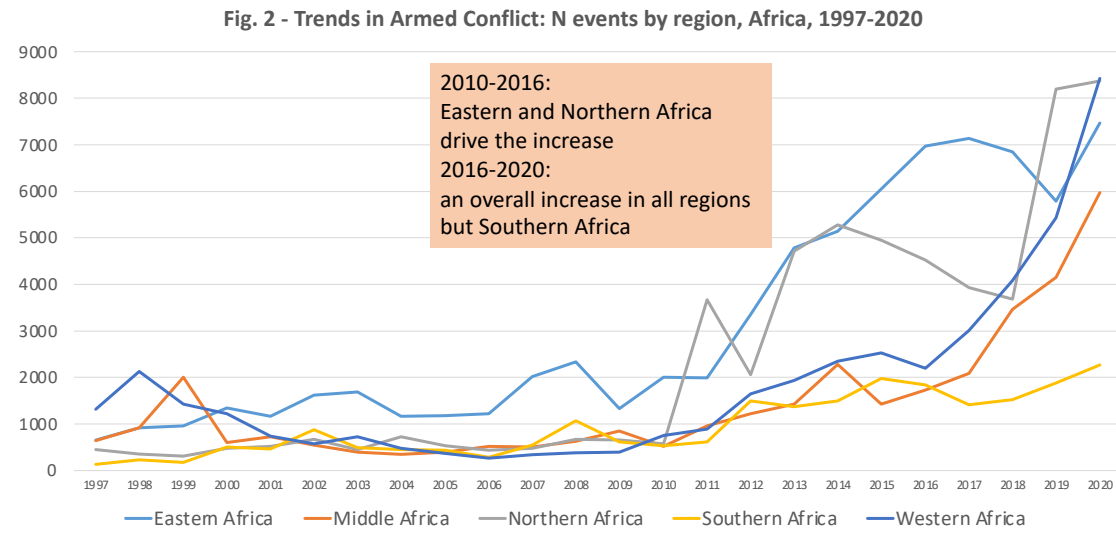

Source: ACLED (Accessed: Sept. 2021.)

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Trends in armed conflict

- An internationalized intra-state conflict has steadily increased starting in 2003 and to 2014, while the interstate conflict was flat, and intrastate and one-sided violence against civilians declined between 1993 and 2014 (Martin-Shields and Stojetz 2019)
- Yet, ACLED data shows an increase in political violence starting in 2014 (for African countries)
- Localized conflict:
  - Many of them affect only a part of the country, and their effects seem to be localized as well but can also spillover at times due to mass displacements (Brück et al. 2016)
  - E.g. Burundi, the Philippines and Senegal

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Food security (USAID)

- Food security means having, at all times, both *physical* and *economic access* to *sufficient food to meet dietary needs for a productive and healthy life.*
  - A family is food secure when its members do not live in hunger or fear of hunger.
- *Why important?*
  - *Food insecurity* is often rooted in *poverty* and has *long-term impacts* on *the ability* of families, communities and countries *to develop and prosper.*
  - Prolonged undernourishment
    - stunts growth, slows cognitive development and
    - increases susceptibility to illness.

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Pillars of food security (FAO 2006)

- Availability
  - – *adequate* supply
- Access
  - – people can obtain food that they need *easily*
- Utilization
  - – people get a *sufficient intake* of the nutrients
- Stability
  - – whether people can *always* access food
- Easy access to adequate supply of nutritious food at all times

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Trends in food security

- Multiple indicators from FAO (2017) database, such as
  - prevalence of undernourishment, % population
  - share of dietary energy supply derived from cereals, roots, and tubers
  - food price volatility index
  - cereal import dependency ratio
- Evidence points towards an improvement in overall food security over 1993-2014 using cross-country data
  - E.g. "prevalence of undernourishment" decreased by about 9%pp (Martin-Shields & Stojetz 2019)

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Consequences of armed conflict for food security

Supply factors

- destruction of infrastructure, supply chains, networks
- make land tough and unsafe to cultivate
- restrictions on movement & challenges to safety will affect ability to trade and also labor mobility
- focus on subsistence methods in agriculture:
  - change in type of crops that are cultivated
  - destruction/ stealing of livestock
- decline in nutritional value of food
- increase in input prices for farmers that translates to higher prices for consumers

Demand factors

- ability to pay is affected as incomes decline
- lower employment opportunities due to travel restrictions
- fewer people travel to mkts & may buy fewer goods
- ability to travel will decrease one's ability to shop for food at lower prices
- shifts in demand – people consume more of home produced food

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Outline: Armed conflict and Food security

1. Does conflict affect food security?
2. Does food security impact conflict?
3. What policies have been used to address food security in conflict environments?
4. Does aid (food aid) impact conflict?
5. Climate and conflict
6. Discussion

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Outline: Does conflict affect food security?

- Effect on human capital
- Household coping strategies
- Mobility restrictions
- Production process
- Markets: Does conflict impact food prices?

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Nutrition and Health in Early Childhood

- There is no reversal of poor nutrition early in life and the damage to health is permanent (Barker, 1999).
- ***Programming* process:**
  - a fetus adjusts to short-term changes in his or her environment
  - such adaptation is beneficial in the short run, but is detrimental to long-term health (Godfrey and Barker, 2000)
- Shocks in early childhood have been linked to:
  - lower education and labor market outcomes, lower stature as adults, poorer learning outcomes, poor health (Almond and Currie 2011)

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Human capital & conflict: Short term impacts on health outcomes

- Kids ages 0-5 and these in utero:
  - Lower *height for age z-scores* (e.g. Akresh et al. 2011 – Rwanda; Akresh et al. 2012 - Eritrea-Ethiopia, Minoiu & Shemyakina 2014 – CIV, Shemyakina 2021 - Zimbabwe)
  - Lower *birth weight for children* (e.g. Camacho 2008 - Colombia; Mansour and Rees 2012- Palestine)
  - Higher *mortality risk* (Verwimp 2012 - Burundi)
- Adolescents during a conflict:
  - Lower heights (e.g. Akresh et al. 2012 - Nigeria; Domingues and Barre 2013 - Mozambique, Grimard & Laszlo 2014 - Peru)

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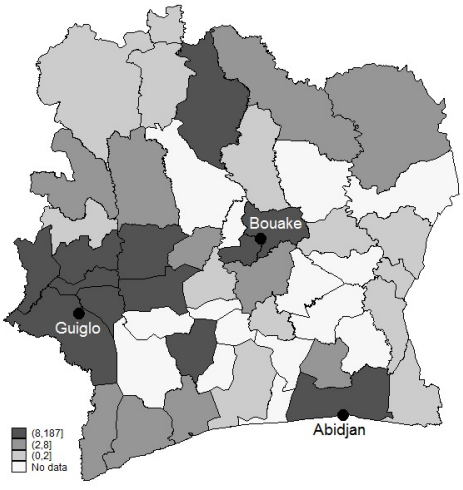
Côte d'Ivoire and ACLED data (Minoiu and Shemyakina 2014)



Shaded areas represent conflict regions. Darker shades indicate a greater number of conflict events reported in the ACLED dataset. In the legend, the "No data" category stands for no reported incidents in the dataset and is treated as zero exposure to conflict in the analysis. The category (8, 187] includes 12 provinces, some of which had relatively low-intensity conflict (between 10 and 30 events) and some with relatively high-intensity conflict, such as Abidjan in the south (187 events), Bouaké in the center (62 events), and the province of Guiglo in the west (48 events).

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Baseline Empirical Specification

$$HAZ_{ijt} = \alpha_j + \delta_t + \lambda_{jt} + \beta_1(\text{Conflict Region}_j * \text{War Cohort}_t) + \varepsilon_{ijt}$$

- Where HAZ_{ijt} is the height-for-age z-score for child *i* in province *j* born in year *t*; α_j are province-of-birth fixed effects, δ_t are birth-cohort fixed effects, λ_{jt} are province-specific trends in cohort health.
- The coefficient estimate for β_1 captures the impact of conflict on the health of children born between September 2002 and December 2007 ("War Cohort") and thus exposed to the conflict either in infancy or *in utero*.
- Allow for gender-specific impact through interaction with "Female"
- Controls:
  - Child: ethnicity and religion
  - Household head: age, education, gender
  - Mother: age, education

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Table 2: Impact of the Conflict on Child Health: baseline effects

	[1]	[2]	[3]	[4]	[5]	[6]
Conflict region*War Cohort	-0.250**	-0.414**				
	(0.094)	(0.149)				
Conflict region*War Cohort*Female						
Conflict region*Exposure 0-24 months			-0.126	-0.369**		
			(0.092)	(0.155)		
Conflict region*Exposure at least 25 months			-0.287**	-0.427**		
			(0.113)	(0.159)		
Conflict region*Exposure 0-24 months*Female						
Conflict region*Exposure at least 25 months*Female						
Conflict region*Exposure (no. of months)					-0.007**	-0.010**
					(0.003)	(0.004)
Conflict region*Exposure (no. of months)*Female						
Female	0.216***	0.217***	0.216***	0.217***	0.216***	0.217***
	(0.061)	(0.060)	(0.061)	(0.060)	(0.061)	(0.060)
Rural household	-0.485***	-0.484***	-0.485***	-0.484***	-0.485***	-0.484***
	(0.092)	(0.094)	(0.092)	(0.094)	(0.092)	(0.094)
Province-specific trends	no	yes	no	yes	no	yes
Observations	15,151	15,151	15,151	15,151	15,151	15,151
R-squared	0.071	0.075	0.071	0.075	0.071	0.075

Robust standard errors in parentheses, clustered at the province level. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable is the height-for-age z-score. All regressions include province fixed effects, month-of-birth fixed effects, and province-specific time trends. In columns 2, 4, 6 the coefficient estimates on interactions between 'Conflict region' or 'Exposure' variables and the female dummy were jointly statistically insignificant and are not shown. All estimates are weighted by inverse sampling probability.

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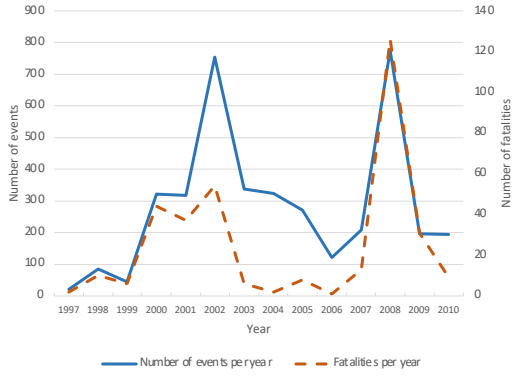
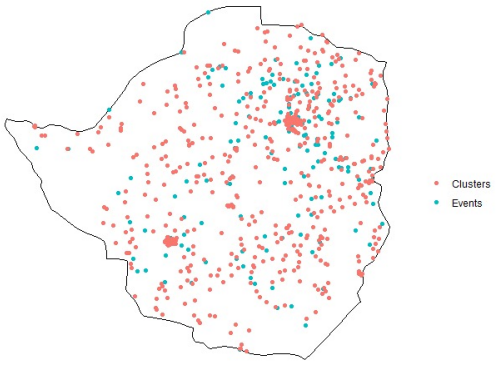
Zimbabwe: conflict events over time and space (Shemyakina 2021)

Fig. 1 - Number of conflict events and fatalities per year



Source: ACLED data (Raleigh et al. 2010), version 7 (1997-2020), accessed 10/16/2020.

App. Fig 1 - Conflict-related events in Zimbabwe & DHS clusters (02/2000 – 07/2005)



Data Source: The location of DHS clusters and events is based on their longitude and latitude coordinates. ACLED dataset (Raleigh et al., 2010). ZDHS 1999 and 2005/2006.

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Panel A: Full sample	Full sample				
	(1)	(2)	(3)	(4)	(5)
Ln events 50km,	-0.002**	-0.002**	-0.002**	-0.002**	-0.002***
02/00-07/05 *months	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Months exposed to the	0.004	0.005	0.004	0.004	0.005
Feb 2000 referendum	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
rural	-0.489**	-0.539***	-0.545***	-0.502**	-0.192
	(0.192)	(0.196)	(0.195)	(0.198)	(0.215)
N	6244	6244	6212	6236	6214
R squared	0.09	0.09	0.09	0.09	0.09
Panel B: non-migrant	Full sample				
sample	(1)	(2)	(3)	(4)	(5)
Ln events 50km,	-0.001**	-0.002**	-0.002**	-0.002**	-0.002**
02/00-07/05 *months	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Months exposed to the	-0.004	-0.003	-0.003	-0.003	-0.003
Feb 2000 referendum	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
rural	-0.438**	-0.494**	-0.497**	-0.455**	-0.286
	(0.187)	(0.201)	(0.199)	(0.203)	(0.226)
N	5473	5473	5449	5466	5445
R squared	0.10	0.10	0.10	0.10	0.10
Interview language	No	Yes	Yes	Yes	Yes
Head controls	No	No	Yes	No	No
Mother controls	No	No	No	Yes	No
HH assets controls	No	No	No	No	Yes

Table 2 – The effect of exposure to political violence on height-for-age z-score

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A summary: ST effects on health

- Both papers: Minoiu and Shemyakina (2014) and Shemyakina (2021) find negative effects of conflict on child health in Cote d'Ivoire (CIV) and Zimbabwe (ZWE) respectively
- The types of conflicts considered
  - civil war (CIV) vs. political violence (ZWE)
- The assignment of conflict exposure at a geographical level to children
  - Province level exposure (CIV)
  - Events within 50km radius from a child's place of residence (ZWE)
- Persistence of effects on human capital

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Human capital & conflict: Long term impacts on health outcomes

- 2nd generation effects in Nigeria:
  - negative and persistent impacts for health and schooling of children of women who grew up during the Biafran war (Akresh et al. 2021).
- In adulthood: effects of destruction in Germany during WWII
  - in utero or infants at the time
    - higher BMI and obesity, and other chronic health conditions such as hypertension and diabetes (Akbulut-Yuksel 2017)
  - children of school age at the time
    - had lower heights as adults, potentially due to the lack of food and a poor access to health facilities (Akbulut-Yuksel 2014)

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Health: channels of conflict shock transmission

- Inability of households to cope with unexpected war shocks (Bundervoet et al. 2008 - Burundi)
- Lack of food & a poor access to health facilities (Akbulut-Yuksel 2014 - Germany)
- Individual household victimization in addition to overall conflict impacts; poor access to health services (Minoiu and Shemyakina 2014 - CIV)
- Decrease in dietary diversity (Dabalen and Paul 2014 - CIV)

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Household coping strategies

- Within household:
  - Cut number of meals, reduce size of meals
- In agriculture, switch from cash-crops to subsistence production
  - Post-war (Brück 2003 – Mozambique)
- Sell off livestock to smooth consumption
  - cattle stock had fallen by half during 1994, but bounced back to about 74% of its prewar level by 2002 (Verpoorten 2009 - Rwanda)
- Different strategies for urban and rural households

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Production process: Change in the returns to factors of production

- Genocide impacts
  - Rwanda lost of almost 800,000 population, majority male due to genocide
  - In the areas of Rwanda that were affected by genocide
    - the returns to labor and education increased and
    - returns to land decreased which is consistent with the large population loss and increased land availability (Serneels & Verpoorten 2015)
- During the civil war in Rwanda
  - access to food was impacted, and the weakest population was affected [one that would typically not get educated], and
  - thus returns to education were not impacted

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Production process: impact varies by sector

- Varied impact by sector (Collier 1999):
  - war-vulnerable (construction, transport, distribution, finance and manufacturing) and
  - war-invulnerable (agriculture and self-subsistence).
  - In Uganda, as a share of GDP:
    - war-invulnerable activities doubled; while war-vulnerable halved.
- The contraction of war-vulnerable sectors increases country's *dependency* on natural resources, which increases the probability of conflict.

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Does conflict lead to food insecurity? – impacting markets? And prices?

- Fewer trips to stores due to safety concerns may reduce demand for products:
  - The data from the longitudinal survey in Kenya conducted before and after the 2008 post-election violent crisis states
    - 94% of the respondents were "worried" about their and their families safety,
    - "76% were unable to procure basic necessities because it was unsafe to travel from their home to the nearest market" during the period of violence (about two months) (Jakiela and Ozier 2019: 548).
- Effect on prices of the reduced D will depend on the elasticity of supply
  - The electoral crisis in Kenya had a very small effect on the wheat and maize markets in Mombassa.
  - Prices exhibited a mean reverting behavior with a small increase and the quantity sold of both products decreased significantly (Gil-Alana and Singh 2015)
  - The observed effects suggest a fairly elastic supply

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Mobility restrictions

- Government imposed:
  - Checkpoints in Gaza and West Bank or other travel restrictions (e.g. border closures) impact household's *resiliency* and ability to provide for themselves as well as have a detrimental impact on *overall economy* by *increasing costs of doing business* (e.g. Calì & Miaari 2018).
- Gangs:
  - Downward pressure on income, material well-being and education within gang territory (Melnikov et al. 2020- El Salvador)
- Drug cartels and crime:
  - Increase outmigration from communities (displacement) (Basu & Pearlman 2017)
  - Reduce employment and impact wages (Mexico)
  - Manufacturing firms, on average, experience a significant reduction in capacity utilization, employment, output, and productivity (Utar 2021)

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Mobility restrictions

- *Long term effects*:
  - Increase costs of production and decrease competitiveness of businesses and the economy (Suárez 2000 - Colombia)
  - Negatively impact GDP:
    - The overall cost of the labor market effects on the GDP is 4-4.4% (Calì & Miaari 2018 - West Bank and Gaza)
  - Decrease the rate of creation of new businesses as conflict exposure was found to increase risk aversion

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Does food insecurity lead to conflict?

- An increase in agricultural prices (holding incomes fixed) will lead to a decrease in the purchasing power of the hhds
  - If households sell off assets to smooth consumption, they will experience lower prices for these assets
- The effect of price shocks differs by sector of production
  - observed results are mixed and depend on the setting find researchers

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Resource price shocks & conflict: Yes (+)

- Harvest shocks outside of African countries and associated with them increases in food prices are associated with an increase in conflict in African regions (De Winne and Peersman 2019).
  - Further, higher food prices lead to higher levels of conflict in agriculturally focused regions.
  - Possibly due to competition for resources
- Higher food prices induce more conflict
  - (Bellemare 2015, & Raleigh et al. 2015)

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Resource price shocks & conflict: muted

- No robust relationship between trade shocks to commodity (across multiple types) prices and a rise in new conflict (Bazzi and Blattman 2014)
- *Rising commodity prices* are *associated with shorter and less deadly wars*
  - in the environment of higher state revenues, states are able to reduce or avoid conflict
- State revenues and taxable crops:
  - a degree of greater observability of revenues from some goods, e.g. minerals and tree crops
  - easily taxable and exportable crops will contribute more to state revenues

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Resource price shocks & conflict: muted

- The effect of prices differs by sector for Colombia (Dube and Vargas (2013)
  - an increase in **coffee prices** leads to a decrease in violence which they relate to an *increased opportunity cost* of recruiting fighters
  - increases in **oil prices** increase violence in oil producing regions, linking it to an increased value of resources available for grabs

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Conflict: Policy and Aid

- Policy interventions
- Impact of food aid:
  - Impact on conflict

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Policy interventions

- Food assistance programs and transfers (Tranchant et al. 2019 - Mali)
  - Being geographically close to rebel groups decreased impact of aid via higher prices
- Cash and in-kind transfers, targeted (labor market) services and restoring access to the infrastructure (Brück et al. 2019 - Gaza)
  - Households benefitted from swift response
- Efficient targeting of households (Verme & Gigliarano 2019)

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Aid and Conflict

- Food aid may increase conflict:
  - An increase in the US food aid to developing countries increases armed conflict incidence by about 4% for each 10% increase in food aid
  - Increase in duration of conflict (Nunn and Quian 2014)
- Food aid may decrease conflict:
  - UN cash transfer program for Syrian refugees has been found to have a small negative impact on recruitment into insurgent groups (Masterson and Lehmann 2020 - Lebanon)

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Food aid can be used to control population

- Governments that receive aid often target it to specific populations, *excluding* opposition groups or populations in potentially rebellious regions.
  - This policy may increase hostilities and promote conflict.
- An example:
  - In *Zimbabwe* in 2003, residents were being forced to display *ZANU-P*F Party membership cards before being given government food aid (Thurow and Kilman 2009).
  - Eastern Zaire case: Hema vs. Lendu
- *"Aid has become a permanent feature of military strategy. Belligerents see to it that the enemy is given as little as possible while they themselves get hold of as much as they can."* (Polman 2010: 10)

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Conflict, Climate Change and Food Security

- Causal pathways from climate change to increased conflict
- Pathways from increased conflict to decreased growth and output with a focus on rain fed agriculture
  - (e.g. Miguel et al. 2014 – Sub-Saharan Africa)
- Greater amount of peasant revolts during droughts
  - Both droughts and floods substantially increased prices of wheat and rice (Jia 2013 - China)

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Discussion and conclusion

- A complex topic with circular effects between conflict and food security
- Limited amount of studies that focus on causal effects
- Need more understanding on where pockets of insecurity lie and what can be done in various environments to improve outcomes

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Thank you!

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