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Agrifood Pathways Linking Climate Change to Conflict

A Systematic Review of the Literature

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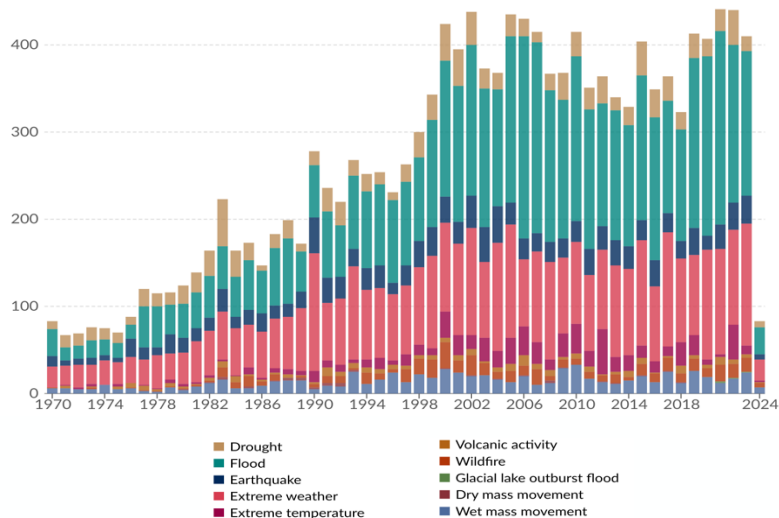
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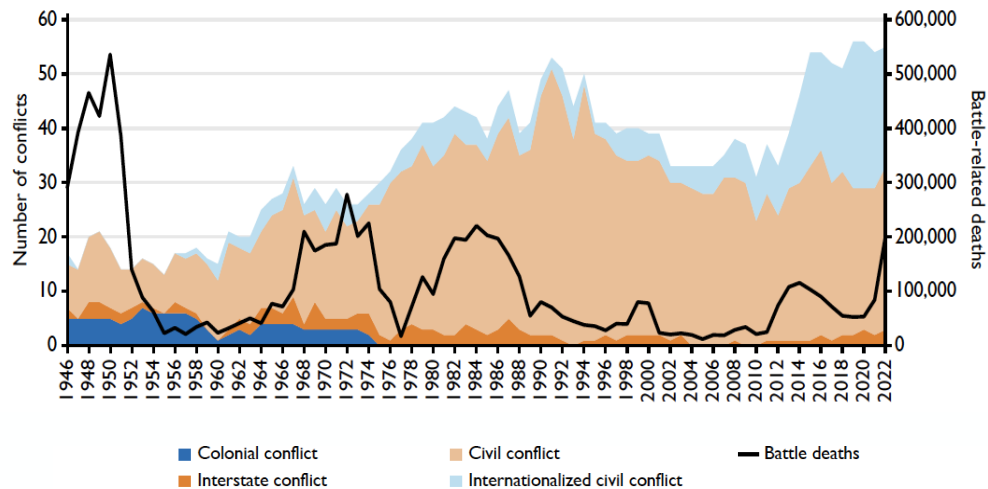
Shocks are on the rise

Natural risks



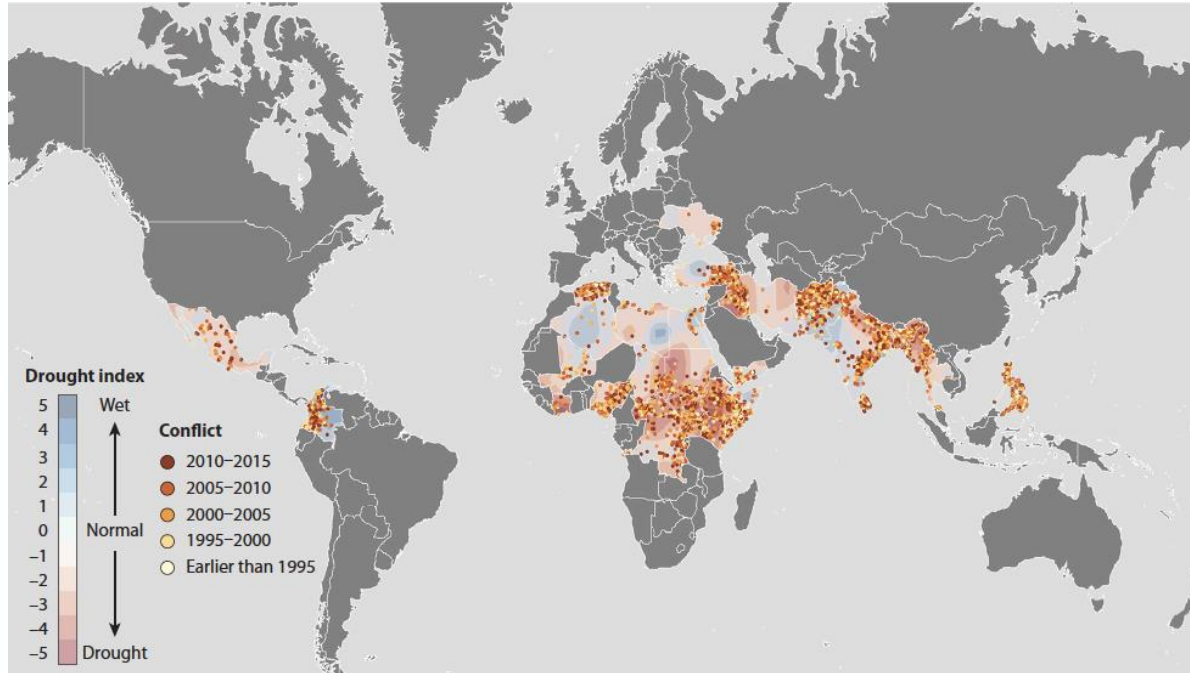
Source: Our World in Data, 2024

(State-based) Conflicts



Source: Obermeier & Rustad, 2023

Correlation btw climate change and conflict



Source: Koubi, 2019

... but what about the mechanisms? And causal inference?

The critical role of agrifood systems

- CC and agriculture
- Two strains of literature
 - AgEcon:
 - CC → agriculture → conflict
 - mostly micro
 - Peace studies:
 - food security/agr livelihood → conflict vs. conflict → food security/ agr livelihood
 - mostly macro/meso
- * Joining these two literatures



PRIN 2022

Climate Change, Violent Conflicts and Welfare:
A Multi-Scale Investigation of Causal Pathways
in Different Institutional Contexts (CC2C)

Objectives

- Pathways linking CC and conflict
- Research gaps in the empirical evidence
 - * *causal inference, micro level*

Methods

- Scoping review
- Systematic Review

Outline

- The approach
 - scoping review/systematic review
- The main pathways
 - increased competition over resources
 - lower agricultural production
- Some preliminary results
 - evidence
 - research gaps
 - future directions for research

Scoping/systematic review

- Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher et al., 2009; Levac et al., 2010; Page et al., 2021)
- PRISMA extension for essential reporting items for scoping reviews (PRISMA-ScR) (Tricco et al., 2018)
- 3 steps
 - identifying the **research question**
 - identifying and selecting **relevant studies**
 - collating, summarizing and reporting **results**

Scoping/systematic review

Research question

What are the conceptual frameworks and empirical applications studying the relationships between climate change and conflict via the mediation of the agrifood system with specific reference to socio-economic analyses

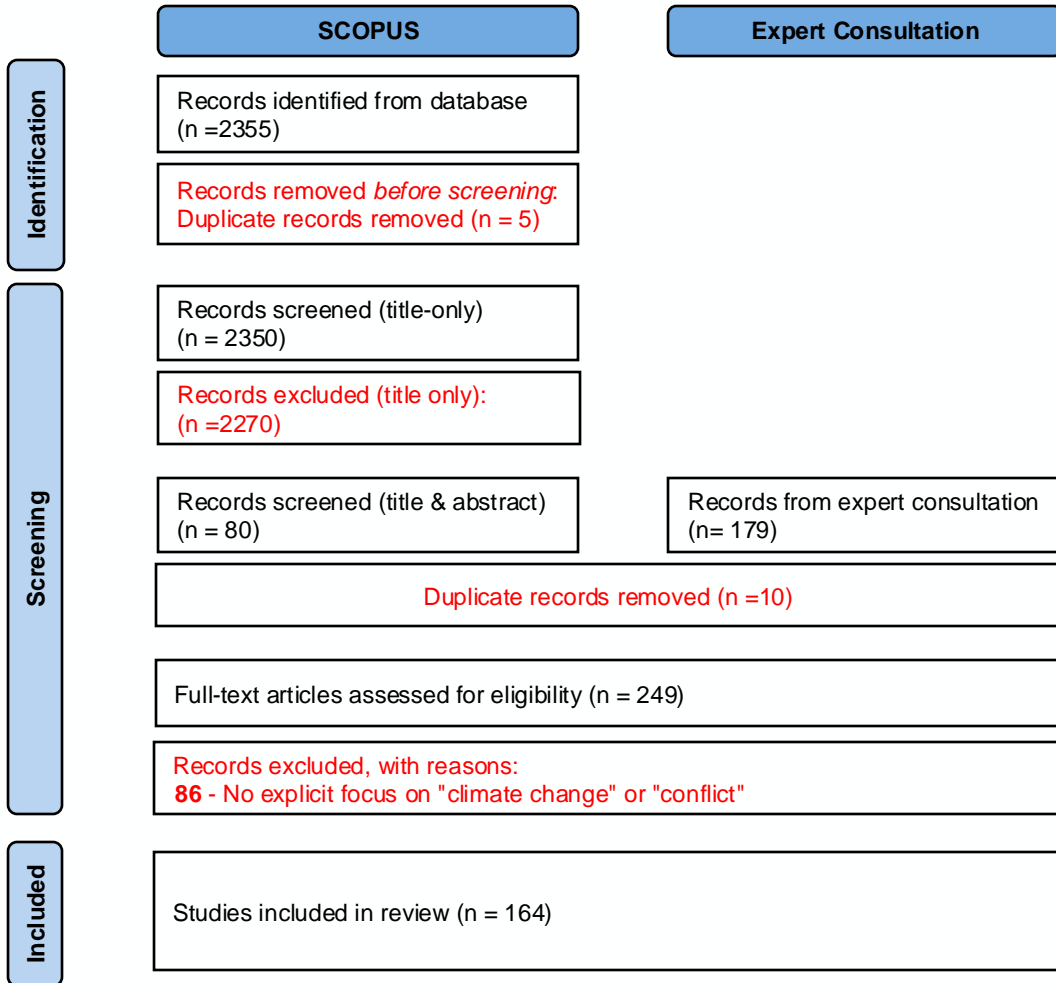
Search queries

SCOPUS Search Query "TITLE-ABS-KEY (
(climat* OR weather OR temperature OR rain* OR spei) AND
(change OR shock* OR drought OR flood*) AND
(conflict* OR violen* OR unrest* OR war OR theft* OR dispute*) AND
(agricultur* OR food OR farm*))" = **4,270 records**

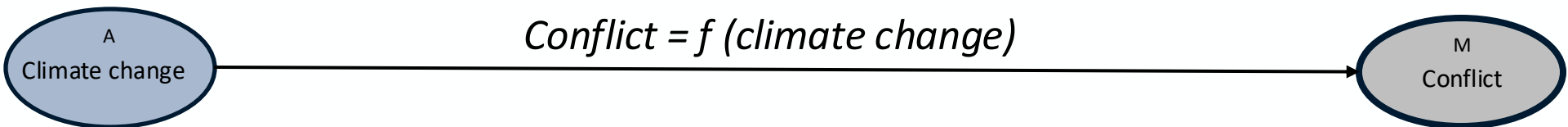
SCOPUS Search Query "TITLE-ABS-KEY (
(climat* OR weather OR temperature OR rain* OR spei) AND
(change OR shock* OR drought OR flood*) AND
(conflict* OR violen* OR unrest* OR war OR theft* OR dispute*) AND
(agricultur* OR food OR farm*)) AND PUBYEAR > 2014 = **2,963 records**

SCOPUS Search Query "TITLE-ABS-KEY (
(climat* OR weather OR temperature OR rain* OR spei) AND
(change OR shock* OR drought OR flood*) AND
(conflict* OR violen* OR unrest* OR war OR theft* OR dispute*)
AND (agricultur* OR food OR farm*)) AND PUBYEAR > 2014 AND (
LIMIT-TO (SUBJAREA,"ENVI") OR LIMIT-TO (SUBJAREA,"ECON")
OR LIMIT-TO (SUBJAREA,"SOCI") OR LIMIT-TO (SUBJAREA , "AGRI"
)) = **2,355 records**

Scoping/ systematic review



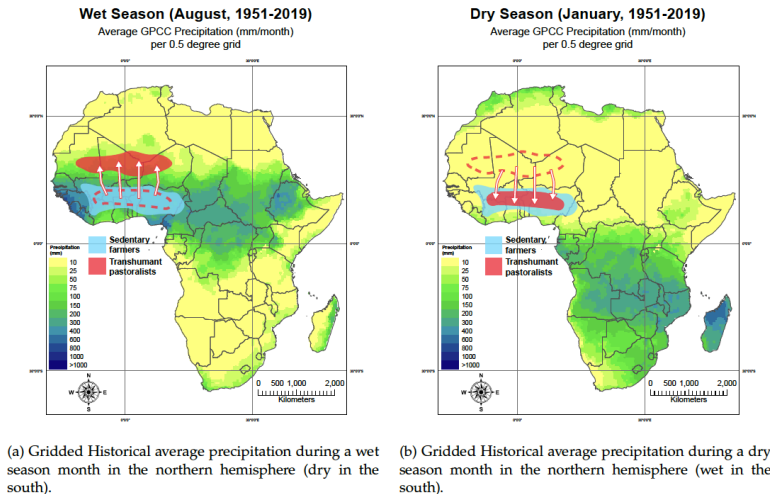
Pathways – Reduced form



... but what about the mechanisms? And causal inference?

Pathways – Ex. 1 McGuirk & Nunn, 2024

- CC effect: from cooperation to competition
- interaction with socio-cultural and institutional factors



Source: McGuirk & Nunn, 2024

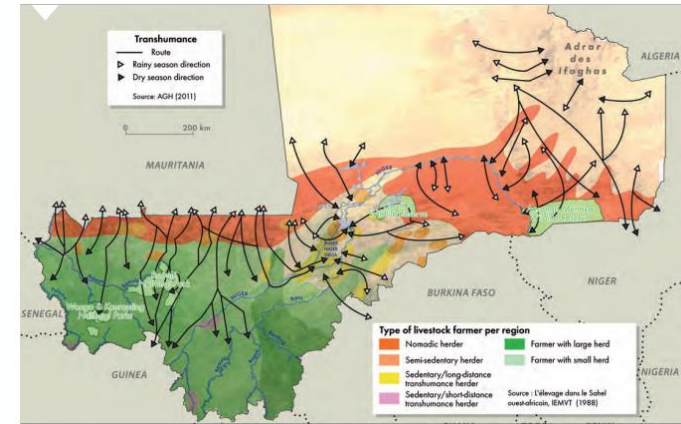
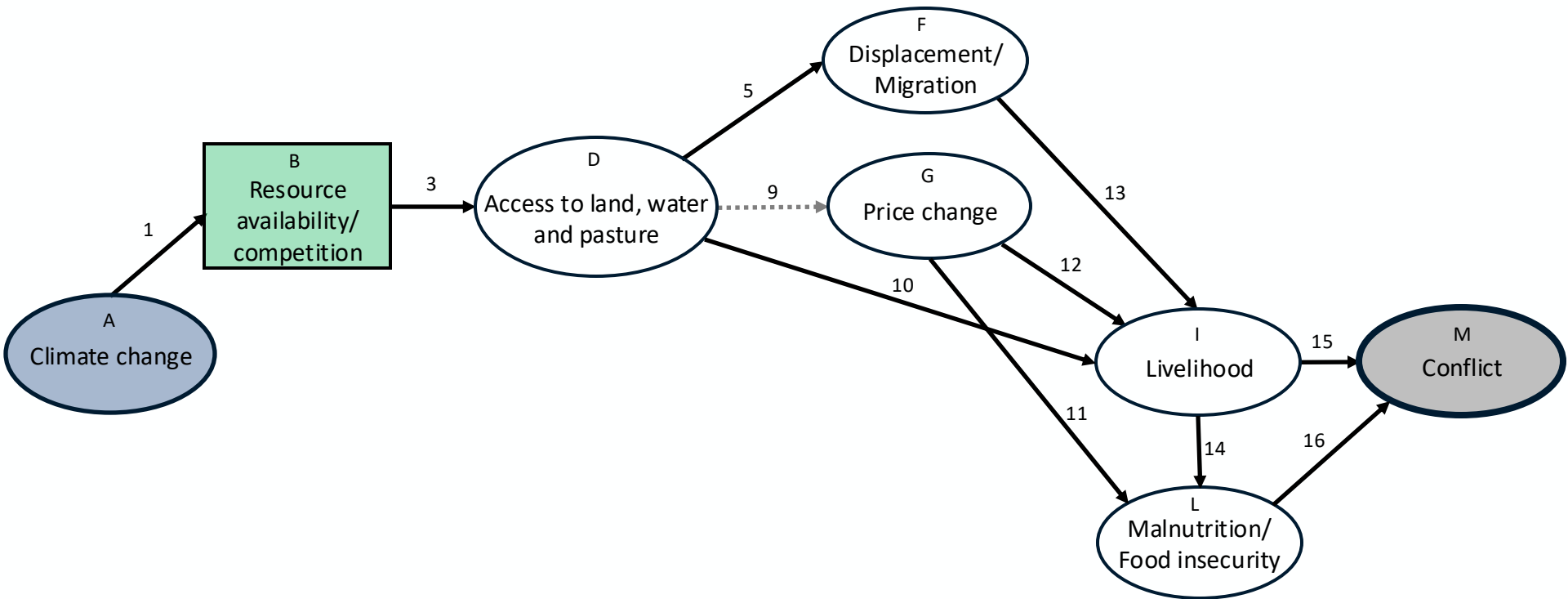


Figure 2: Seasonal transhumance routes of nomadic pastoralists in Mali

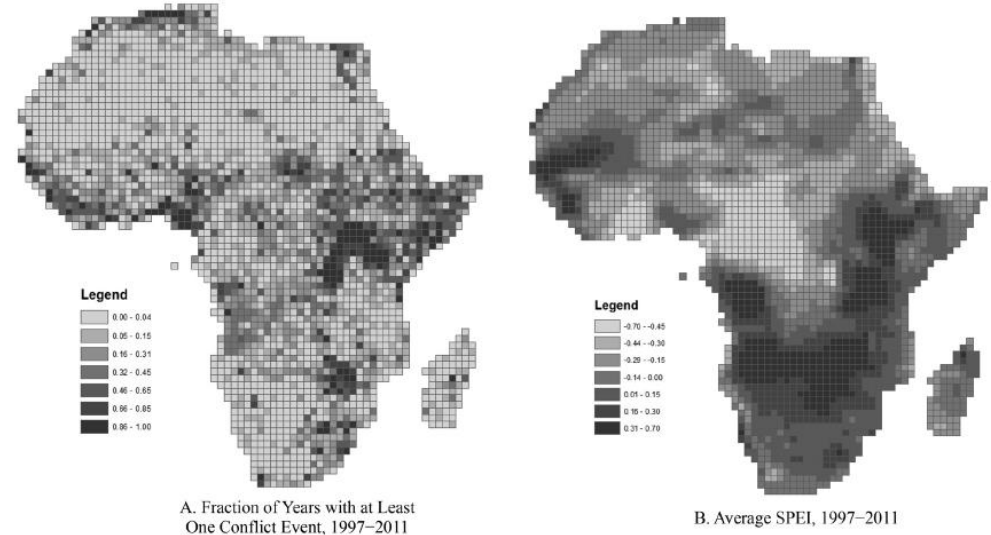
Pathways – 1. Competition over nat. resources



Pathways – Ex. 2 Harari & La Ferrara, 2018

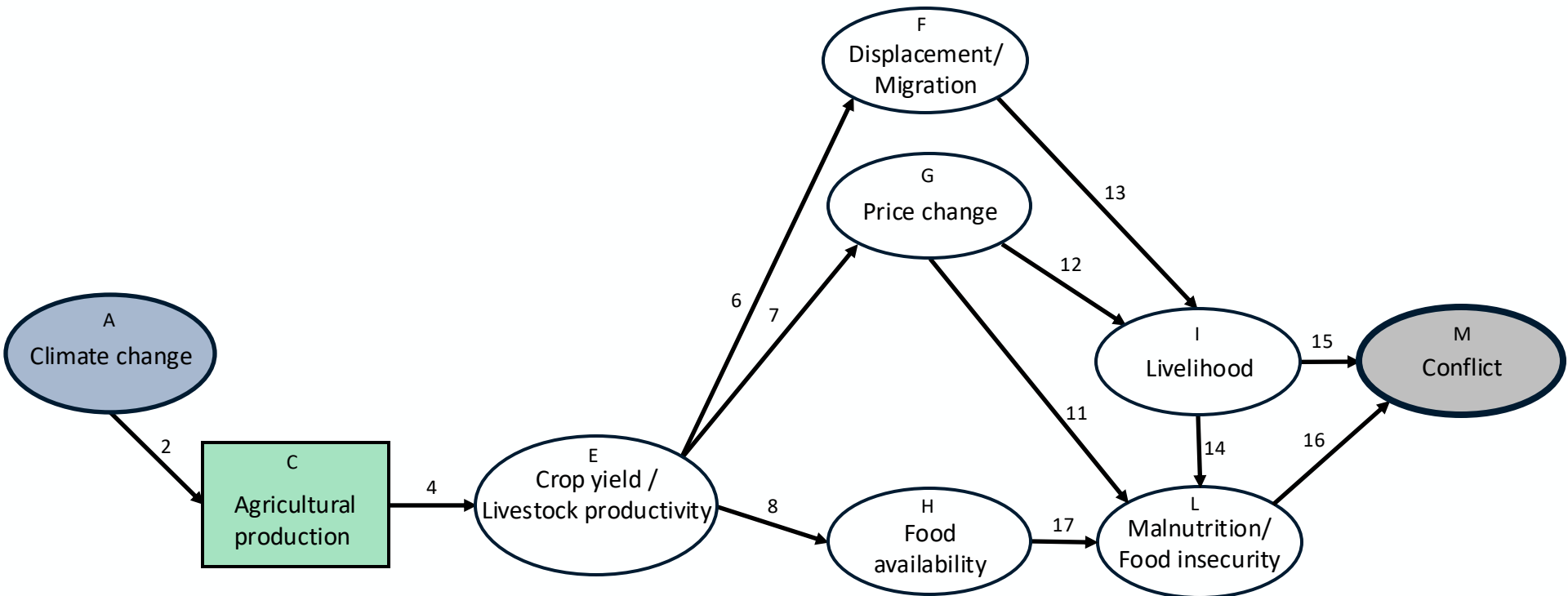
- CC effects: agricultural production shock
- 1 SD shock to SPEI during the growing season is associated with a 1.3 percentage point increase in conflict likelihood in the next year

FIGURE 1.—CONFLICT AND CLIMATE—SPATIAL DISTRIBUTION

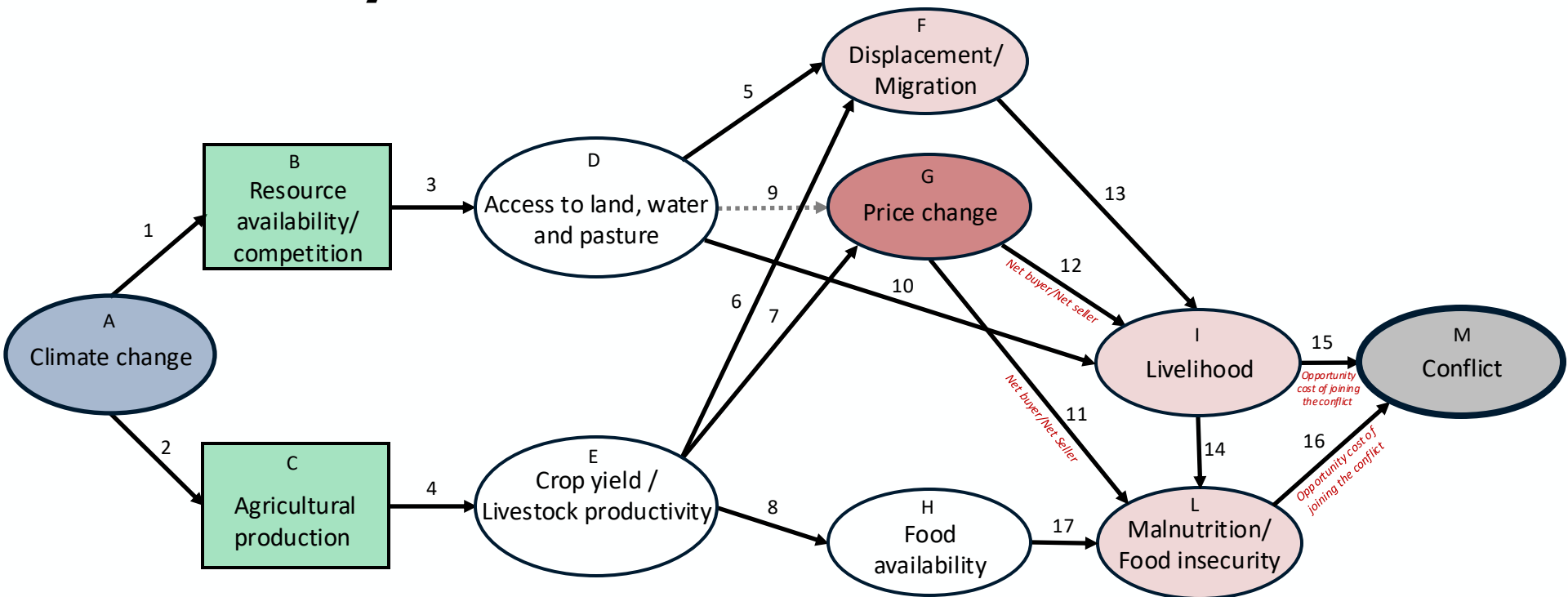


Source: Harari & La Ferrara, 2018

Pathways – 2. Reduced agricultural production



Pathways – Overview



Research gaps: semi-reduced forms

Links	Authors	Specification
E-M	Buhaug & Wischnath, 2014	Conflict = f(food production growth)
A-F-M	McGuirk & Nunn, 2024	Conflict = f(transhumant pastoralist nearby, rainfall)
A-I-M	Fjelde & von Uexkull, 2012	Conflict = f(rainfall anomalies, poverty, political exclusion)
A-E-M	Cappelli et al., 2023	Conflict = f(rainfall anomalies, temperature, agricultural vulnerability)
A-I-M	Eastin, 2018	Conflict = f (Insurgent Recruitment (precipitation deviation) + (Government Response (livelihood impact)))
A-E-H-M	Caruso et al., 2016	Conflict = f (rice availability pc (rice yield (temperature)))
A-E-M	Vesco et al., 2021	Conflict = f(Climate variability, crop production concentration)
A-G-M	Maystadt & Ecker, 2014	Conflict = f(livestock price(rainfall anomalies, temperature anomalies, drought length))
A-F-M	Petrova, 2021	Protest = f(migration likelihood (drought, flood))
A-E-M	Harari & La Ferrara, 2018	Conflict = f(SPEI growing season)
A-C-I-L-M	Helman et al., 2020	Conflict = f(warming, rain, yield, welfare)
A-D/E-M	Cappelli, 2024	Conflict = f(SPEI growing season, access to resources, agricultural vulnerability)
A-E-L-M	Pacillo et al., 2022	Conflict = f(food insecurity(maize production(precipitation anomalies, temperature anomalies)))

Conceptualization/evidence: specific links

Links	Conceptualization only	Empirical evidence
1	Abrahams, 2020	McGuirk & Nunn, 2024
2	Koubi, 2019	Cappelli et al., 2023; Eastin, 2018
3	Buhaug et al., 2022; Koubi, 2019	McGuirk & Nunn, 2024
4	Buhaug et al., 2022	Caruso et al., 2016; Vesco et al., 2021; Harari & La Ferrara, 2018; Cappelli, 2024; Pacillo et al., 2022
5	Buhaug et al., 2022	Abrahams, 2020
6	Koubi et al., 2018	Eastin, 2018, Petrova, 2021
7	Buhaug et al., 2022; Koubi, 2019	Maystadt & Ecker, 2014
8	Buhaug et al., 2022	Caruso et al., 2016
9	Buhaug et al., 2022	
10		
11	Koubi, 2019	
12	Koubi, 2019	
13	Buhaug et al., 2022	
14		
15	Buhaug et al., 2022; Koubi, 2019	Fjelde & von Uexkull, 2012; Eastin, 2018; Helman et al., 2020
16	Buhaug et al., 2022; Koubi, 2019	Wischnath & Buhaug, 2014; Helman et al., 2020; Cappelli, 2024; Pacillo et al., 2022
17	Buhaug et al., 2022	Pacillo et al., 2022

Empirical evidence gaps: specific links

Links	Empirical evidence
1	McGuirk & Nunn, 2024
2	Cappelli et al., 2023; Eastin, 2018
3	McGuirk & Nunn, 2024
4	Caruso et al., 2016; Vesco et al., 2021; Harari & La Ferrara, 2018; Cappelli, 2024; Pacillo et al., 2022
5	Abrahams, 2020
6	Eastin, 2018, Petrova, 2021
7	Maystadt & Ecker, 2014
8	Caruso et al., 2016
9	Access to resources → Price change
10	Access to resources → Threat to livelihood
11	Price change → Malnutrition/Food insecurity
12	Price change → Threat to livelihood
13	Displacement/migration → Threat to livelihood
14	Threat to livelihood → Malnutrition/Food insecurity
15	Fjelde & von Uexkull, 2012; Eastin, 2018; Helman et al., 2020
16	Wischnath & Buhaug, 2014; Helman et al., 2020; Cappelli, 2024; Pacillo et al., 2022
17	Pacillo et al., 2022

Some preliminary conclusions

- Conceptually, quite clear framework: complex interactions
- Empirically,
 - from macro/meso to micro
 - from reduced forms to mechanism analysis
 - the agricultural production pathway relatively more studied than the resource competition pathway
- Significant gaps in empirical evidence, espec. at the micro level
 - need to establish causal links
 - some links more studied than others (e.g. the ones closer to conflict)
 - threat to livelihood → conflict
 - malnutrition/food insecurity → conflict

Some preliminary conclusions

- The central role of (food) price changes
- Policy implications: improving resource management, enhancing agricultural productivity, and ensuring food security can mitigate the risk of conflict in the face of climate change
- Future research directions:
 - more robust causal inference studies at the micro level
 - comprehensive empirical studies to validate conceptual frameworks
 - an interdisciplinary approach combining insights from agronomy, economics, and peace studies



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Many thanks for your attention

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<https://www.cc2conflicts.unifi.it/index.html>

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