Anthropocene Mobilities:

Navigating the Complexities of Climate-Induced Migration

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Increasing climate displacement worldwide

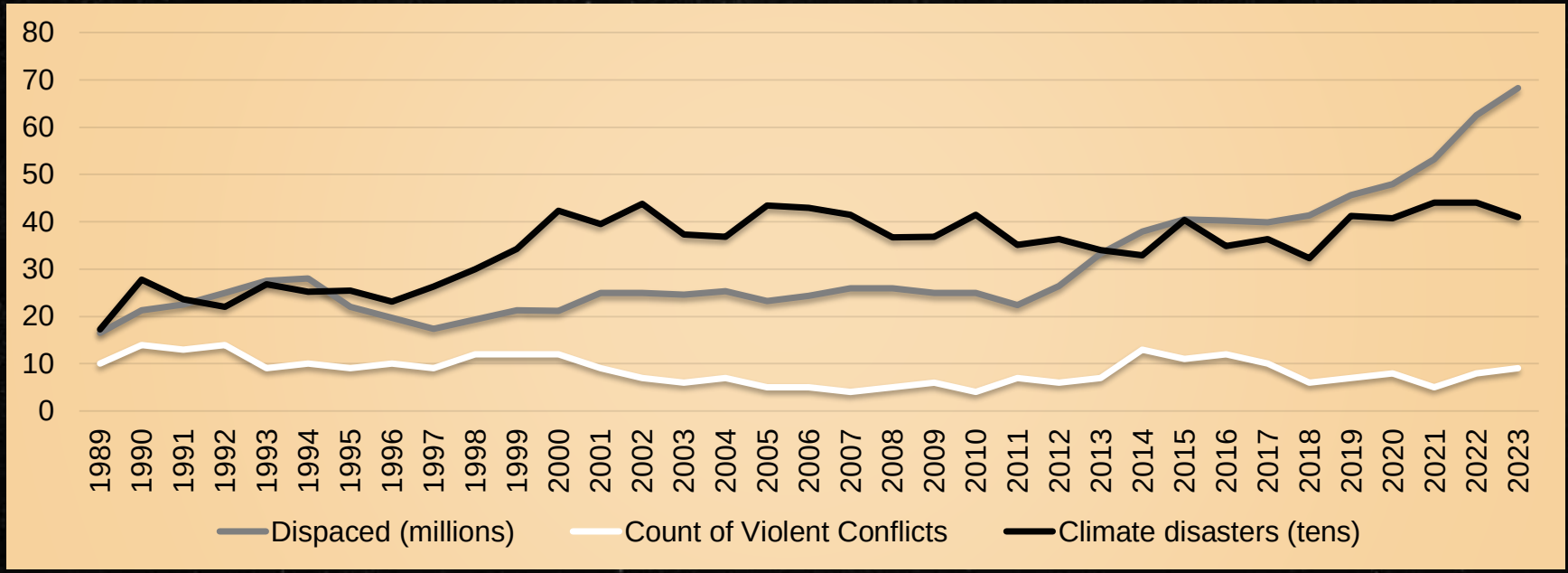
- 21 million
- By 2050, 1 billion



Photo Credit: Mahmud Hossain Opu, AlJazeera

Displacement & Disasters

Today, at least 30% of IDPs are estimated to be displaced due to climate change



Source: World Bank Global Development Indicators

Research Questions

- How is climate change driving human migration, and what are the broader implications for global stability?
  - What are the drivers of migration in the Anthropocene?
  - What are the consequences of climate-induced migration?
  - How should legal frameworks and policies respond to the challenges posed by climate-induced migration?

Roadmap

- Definitions: Anthropocene mobilities, climate migration
- Drivers: Climate & economic shocks
- Consequences: Conflict & development
- Responses: Laws & vulnerability
- Future Work & Closing Remarks



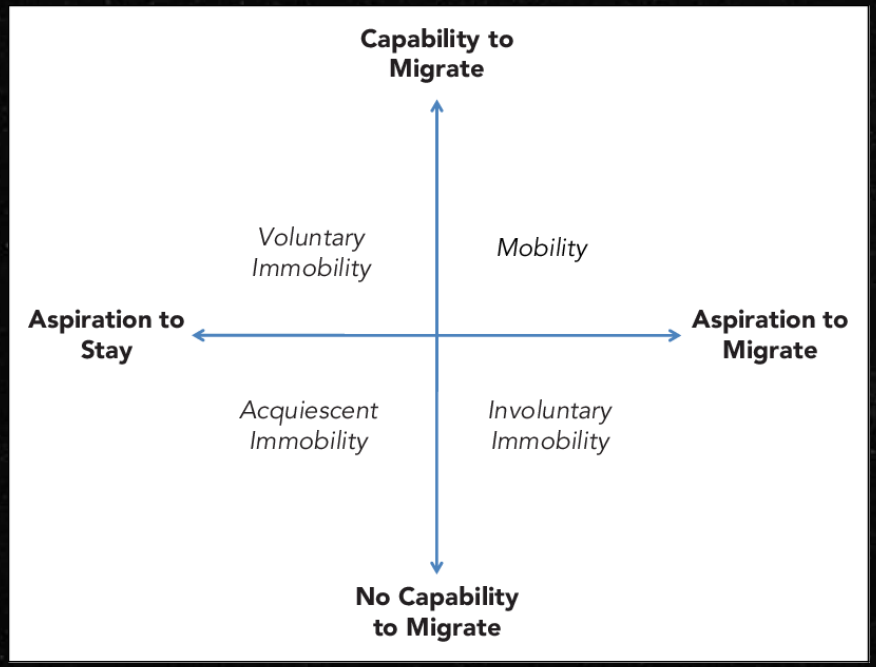
Anthropocene

Current era where human activities have become the dominant force impacting the planet.



Mobility

Ability, capacity, and/or necessity to move locations.



Schewel, K. (2020) Understanding immobility

Mobility

Ability, capacity, and/or necessity to move locations.

Sudden & Gradual climate migrants

Gradual Climate Migrants:

- Experience incremental declines in agricultural yields over time.
- Migration decision is based on the sustainability of livelihood.

Sudden Climate Migrants:

- Suffer from sudden climate disasters, leading to loss of home and property.
- Forced displacement due to immediate climate-related events.

Anthropocene Mobilities

=

Climate change, driven by human actions, is forcing people to migrate.

Drivers of Climate Migration

Research Question

- What are the drivers of migration in the Anthropocene, particularly in the context of climate change and economic shocks?

Nexus of Crises in the Anthropocene

- **Evidence from Bangladesh:**
  - Push & pull factors
  - The nature of modern-day industrialization is changing
  - Vulnerability to shocks in the Global South

Why Bangladesh?

Climate Vulnerability in Bangladesh:
- An example of the challenges posed by climate-induced migration and economic scarcity.

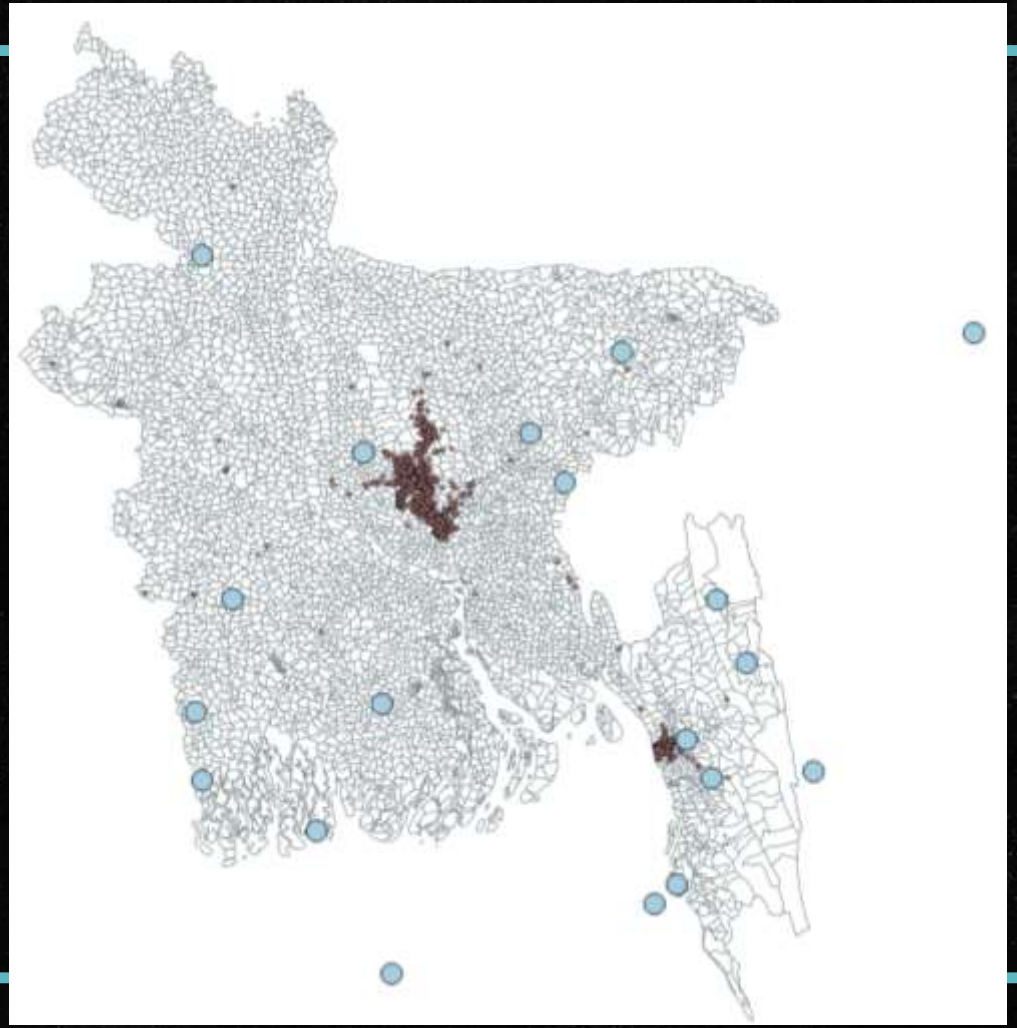
Economic Scarcity and Garment Industry:
- Booming industry attracts migrants for economic stability amidst climate-related adversities.

Industrializing State Dynamics:
- Circular migration
- Government capacity is critical:
    - Responding to Climate Disasters
    - Managing Migration Shocks
    - Navigating Economic Shocks



Climate *Push Factor* of Migration

Spatio-temporal autocorrelation shows that factories tend to be established further from zones impacted by climate disasters following such events.



Blue:
Climate disasters

Red:
Factory location

Bangladesh has undergone a profound economic shift:

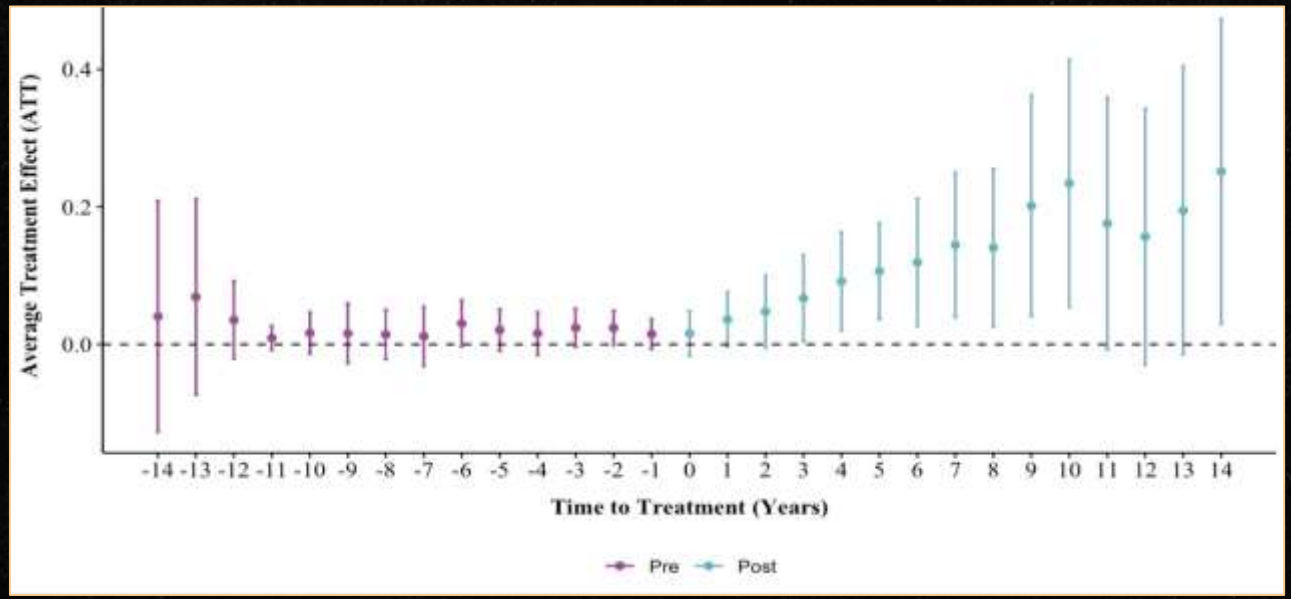


- The nation's agricultural exports have plummeted by 50% since 1995
- Garment sector has skyrocketed, now constituting over 85% of the country’s total exports
- Now we analyze an economic draw in the context of this climate-amplified rapid urban development.

Economic *Pull Factor* of Migration in the context of climate change

Pooled ATT: The emergence of an RMG factory leads to a 13.2% increase in Population Density

Economic Pull Factor on Migration



Drivers
Key Points

- Climate is another push factor of the decision to migrate, and is increasingly causing forced displacement
  - Sudden climate migrants
  - Gradual climate migrants
- Climate is severely impacting modern day development and in doing so, can increase conditions for vulnerability and instability

Consequences of Climate Migration

Research Question

- What are the consequences of climate-induced migration, particularly in terms of conflict, conflict resolution, and social instability?

The Intersection of Migration & Conflict in the Anthropocene

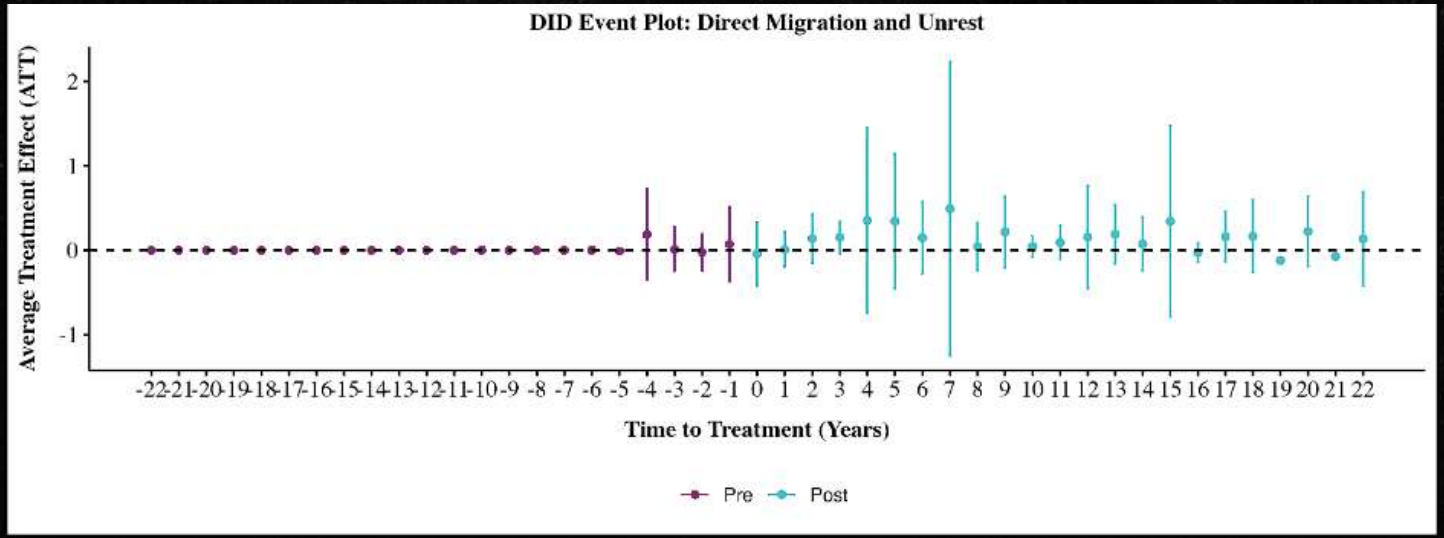
- Urban Unrest
  - Bangladesh
  - Global Trends
- Armed Conflict
  - Rebel Demands
  - Peace Provisions

Bangladesh Unrest Results

- Extension of previous migration identification
- Evidence from units that have experienced rapid economic migration in the context of climate change

Effect of Rapid Urban Migration on Levels of Unrest

Rapid migration alone does not inherently lead to unrest

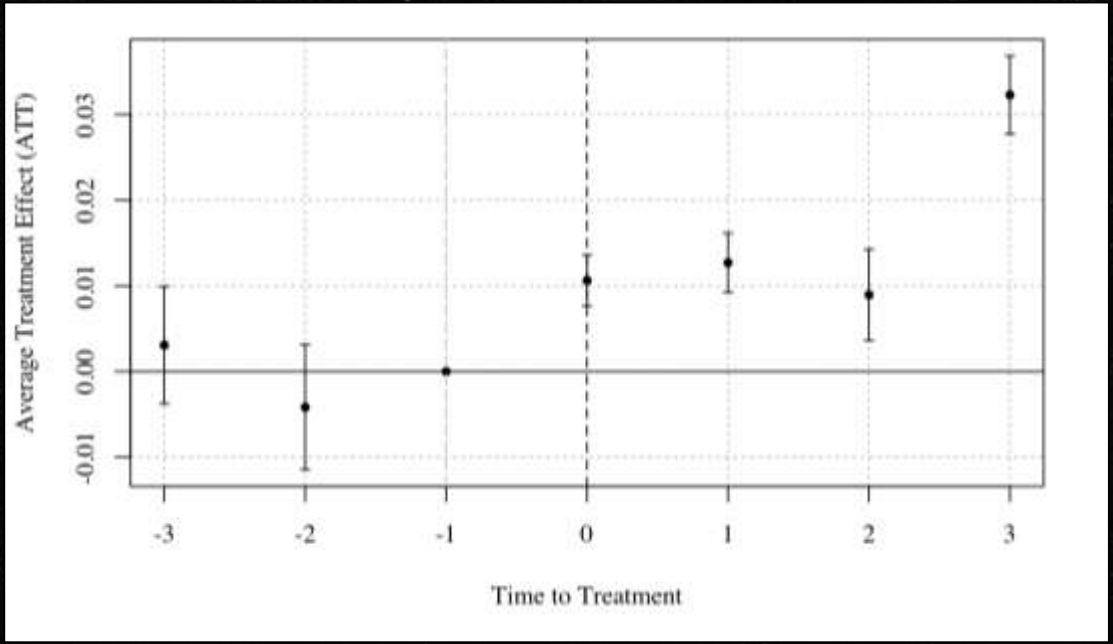


Effect of Rapid Urban Migration X Negative Economic Conditions on Levels of Unrest

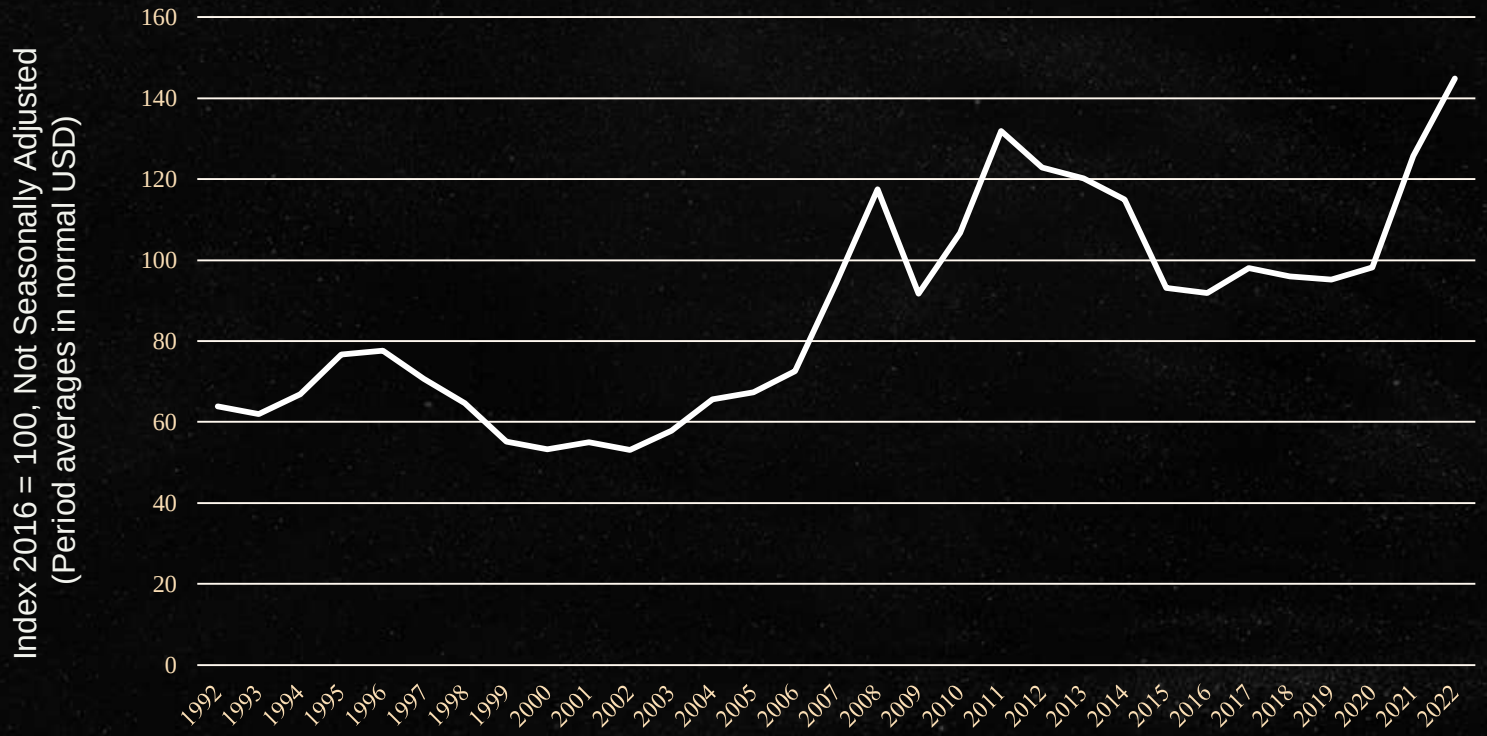
Interacting post-urban migration units with global food prices leads to an increase in unrest across the post-treatment period

AKA: The effect of negative economic shocks on unrest is greater in units that have experience rapid migration

Why? Costs associated with migration are high, so negative economic outcomes leads to deeper grievances



Global Food Prices (1992-2022)



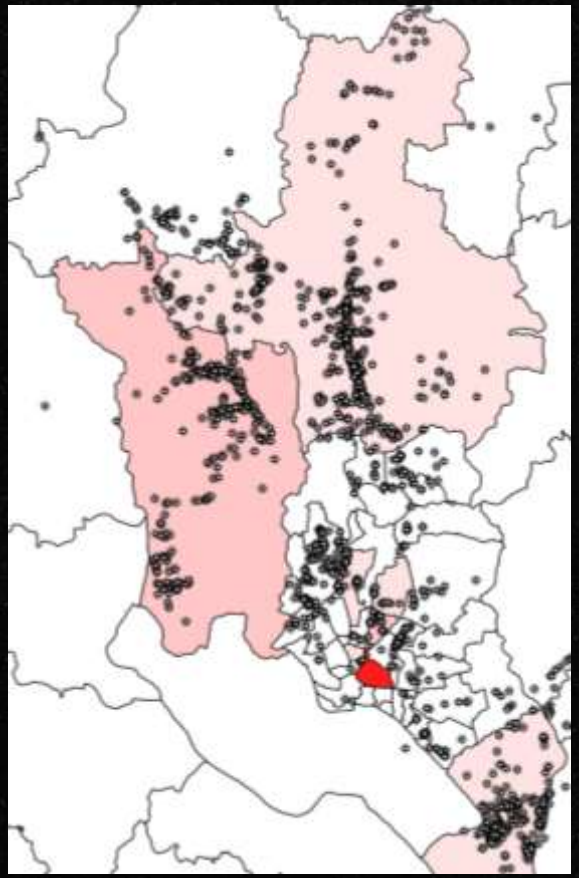
Levels of Unrest & Factory Distribution

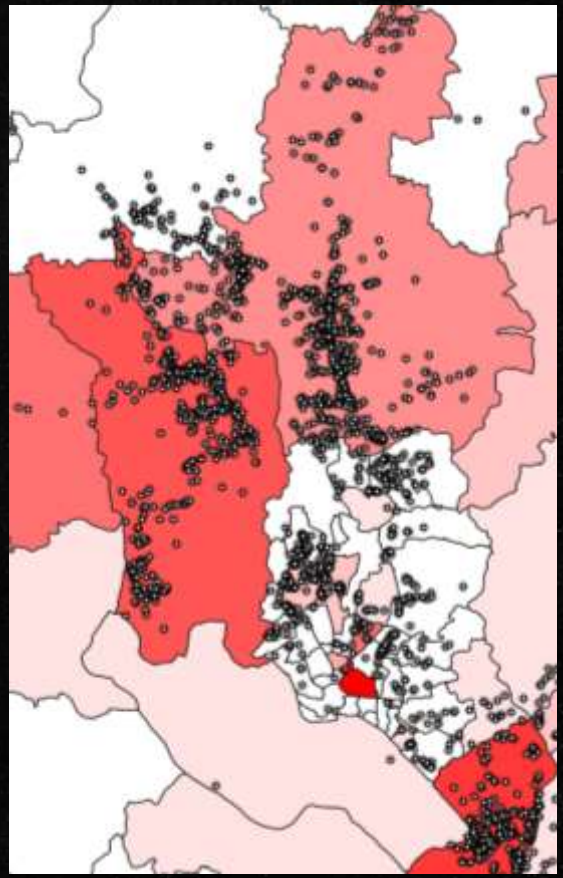
Evidence in Urban Bangladesh



pre-food shock *(2006-2008)*

post-food shock *(2009-2011)*



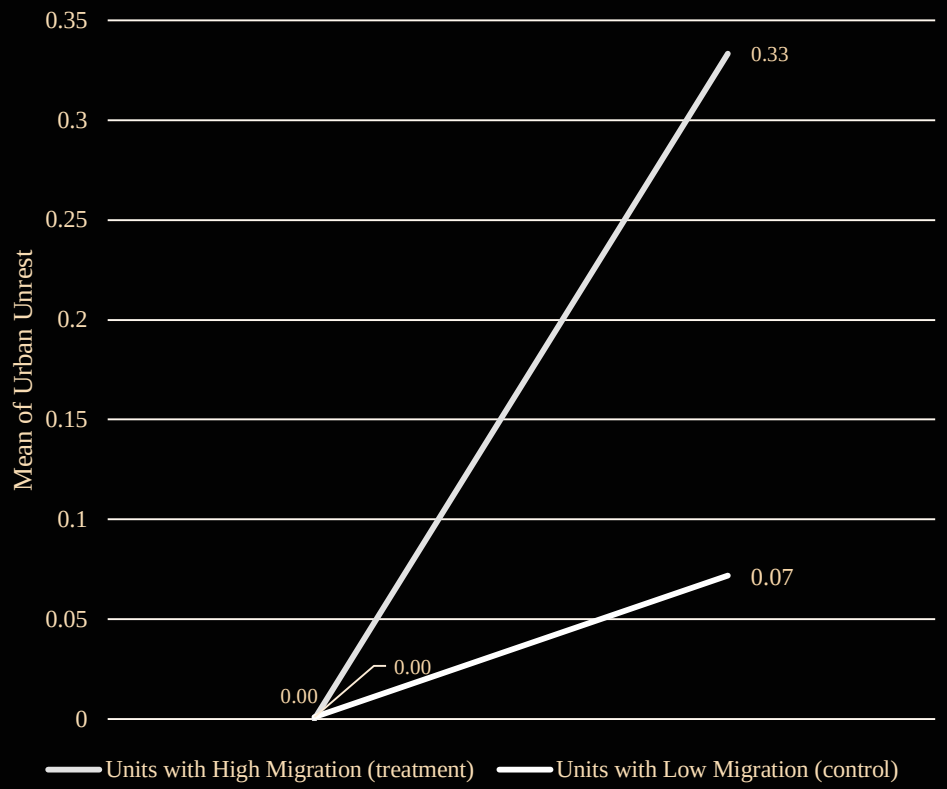


Factory Location

No Unrest

High Unrest

Differences of Means in Unrest in Units with High vs. Low Migration



GLOBAL TRENDS

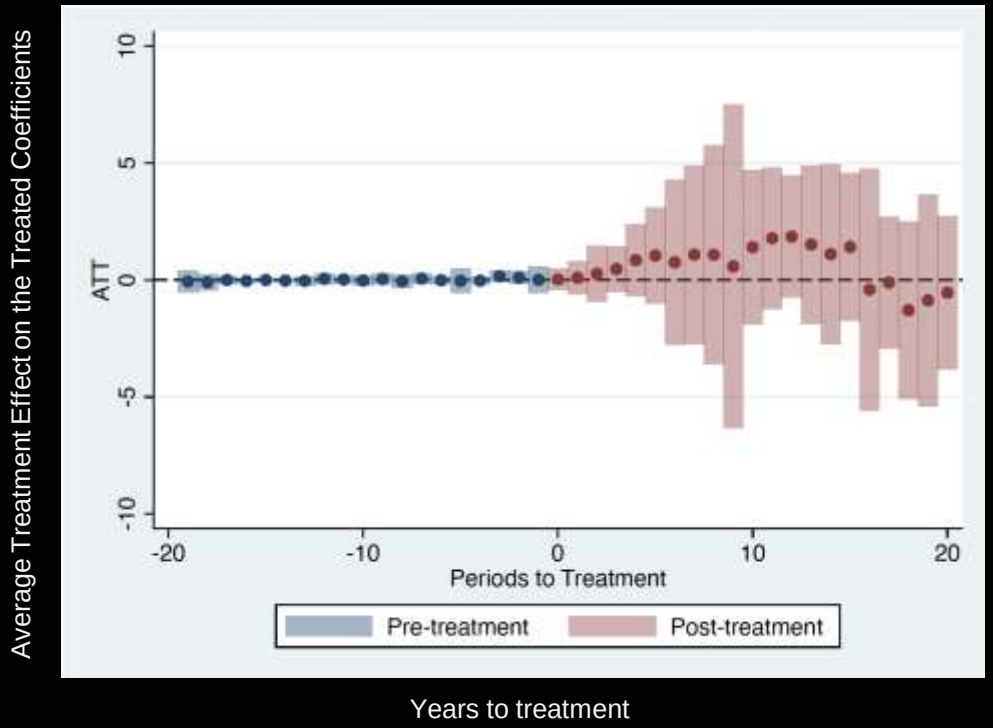
- Proxy for migration using units in immediate disaster area and larger units
- Outcome: Unrest

GLOBAL TRENDS: Environmental disaster & civil unrest

- Immediate area surrounding the disaster event
- Not statistically meaningful

$$Y = \beta_1 Disaster + \beta_2\ Occurrence + \beta_3\ (Disaster \text{ x } Occurrence) + \varepsilon$$

Emergence of Climate-Related Disasters on Civil Unrest



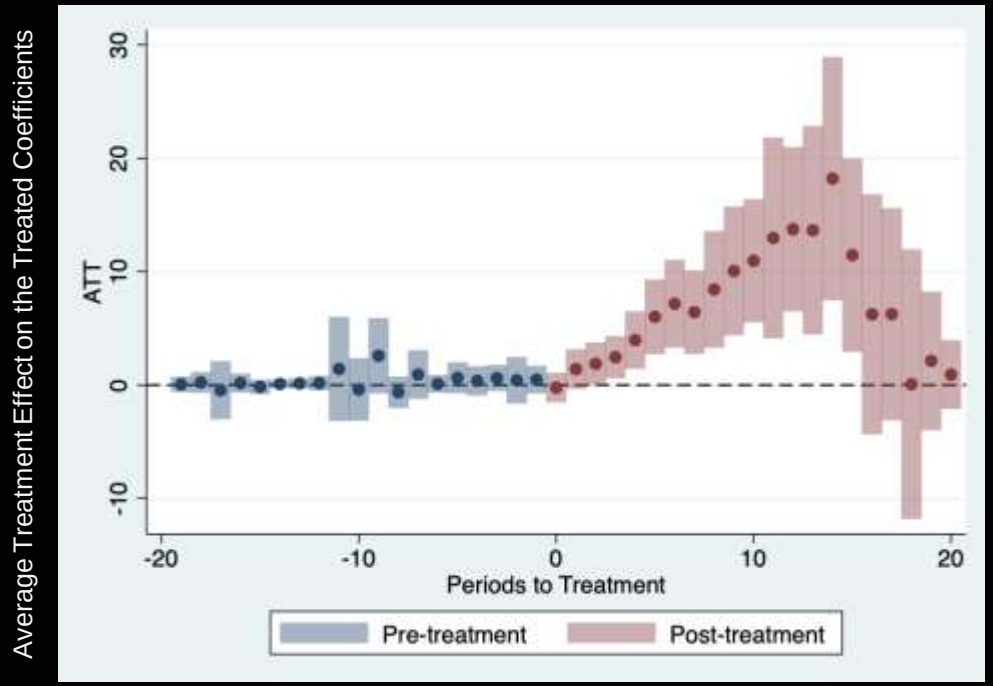
Years to treatment

GLOBAL TRENDS: Environmental disaster & civil unrest

- Larger units surrounding the event (e.g. state or province sized)
- Pooled ATT: 6.7% increase in events of civil conflict

$$Y = \beta_1 Disaster + \beta_2\ Occurrence + \beta_3\ (Disaster \times Occurrence) + \varepsilon$$

Emergence of Climate-Related Disasters on Civil Unrest



Intersection of Migration & Armed Conflict

- Exacerbating effect of various forms of displacement and vulnerability

- Rebel demands
- Peace Provisions

CLIMATE SHOCKS & REBEL DEMANDS

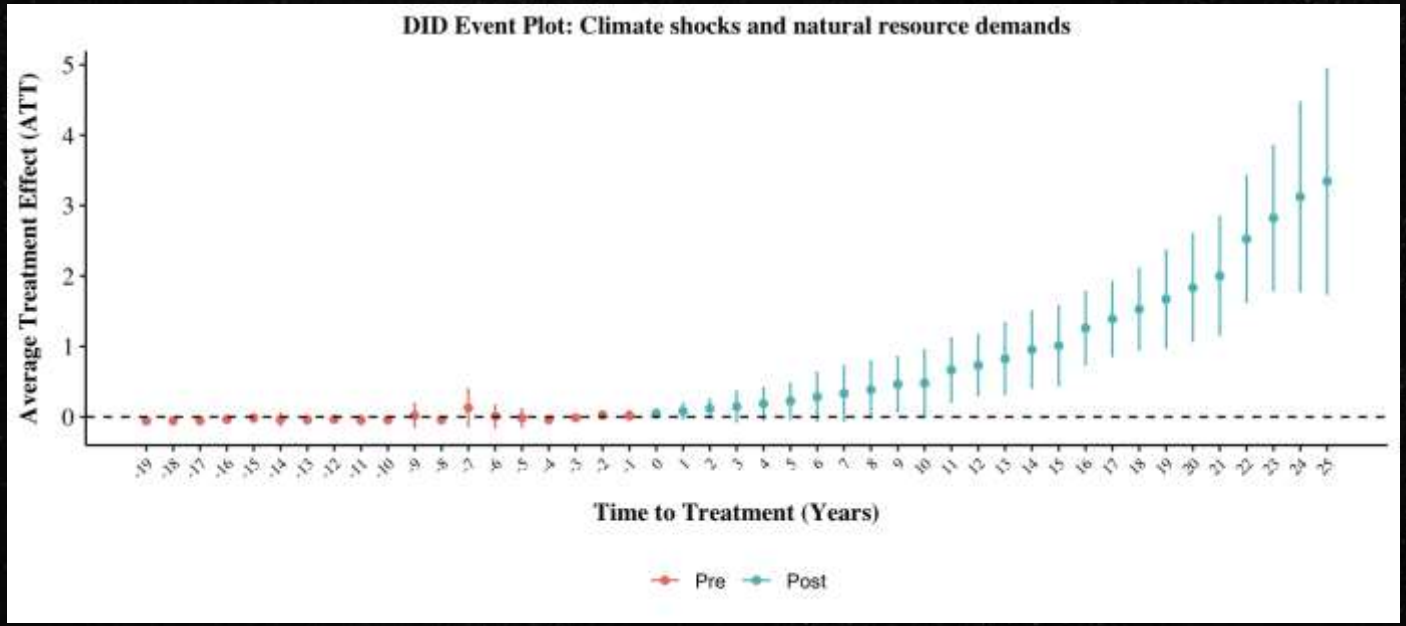
- Major and ongoing armed conflict already often has mass displacement crises. Climate disasters interact with existing vulnerabilities in conflict to make reconciliation even harder.

  - Natural Resources
  - Water Resources
  - Land Reform

Climate Shocks & Rebel Demands: Natural Resources

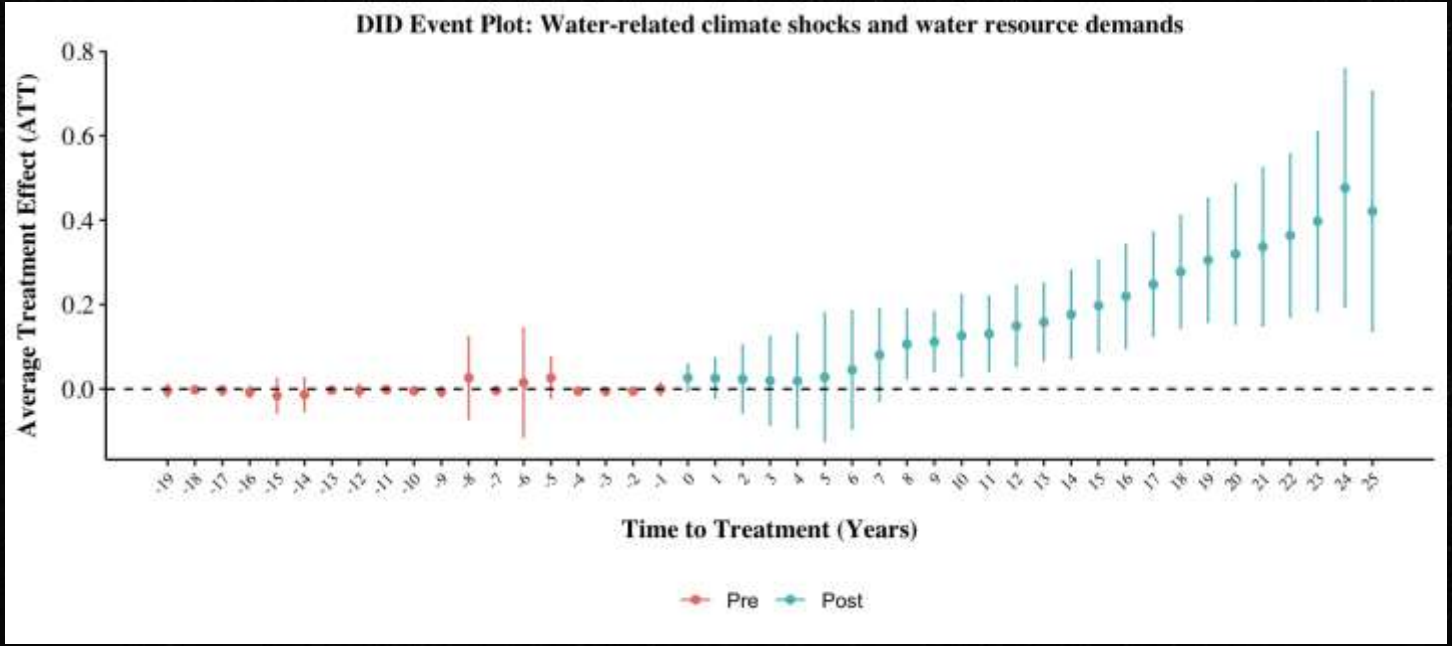
In protracted conflicts already facing issues of mass displacement, climate shocks lead to:

- Increase in natural resource demands



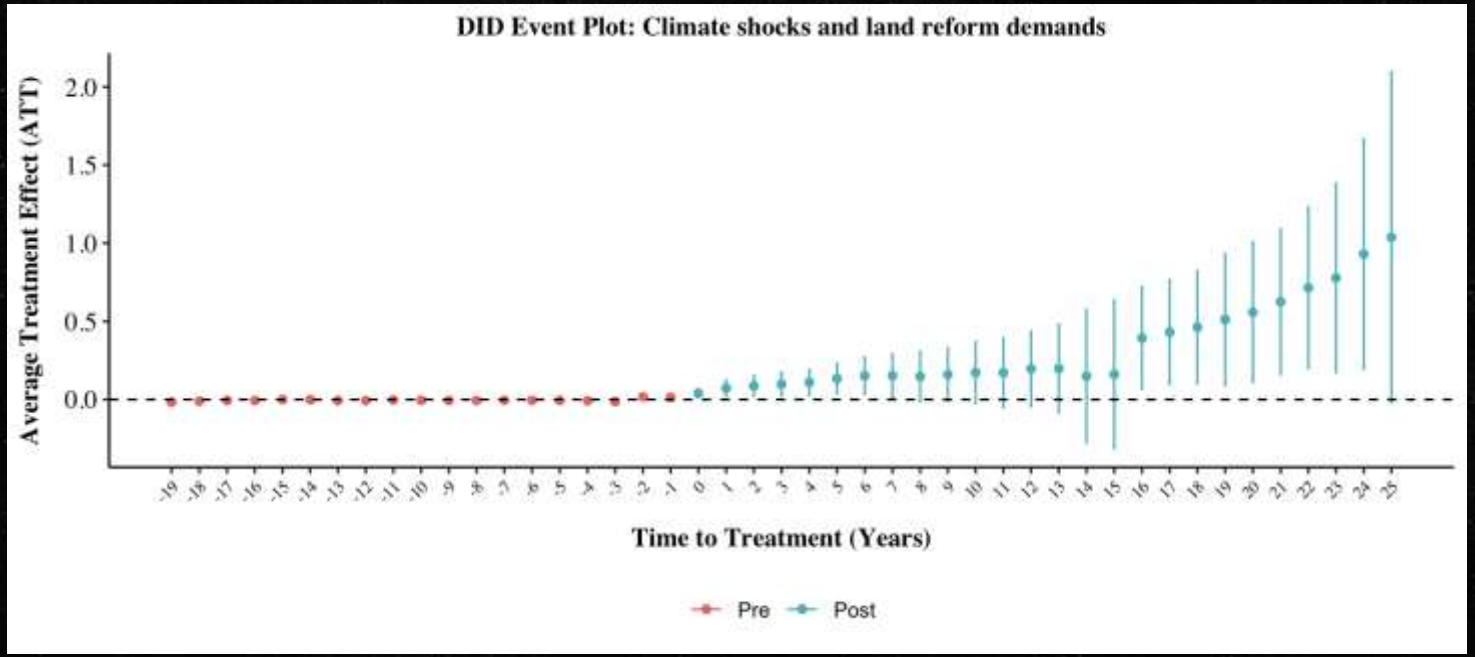
Climate Shocks & Rebel Demands: Water Resources

- Increase in water resource demands



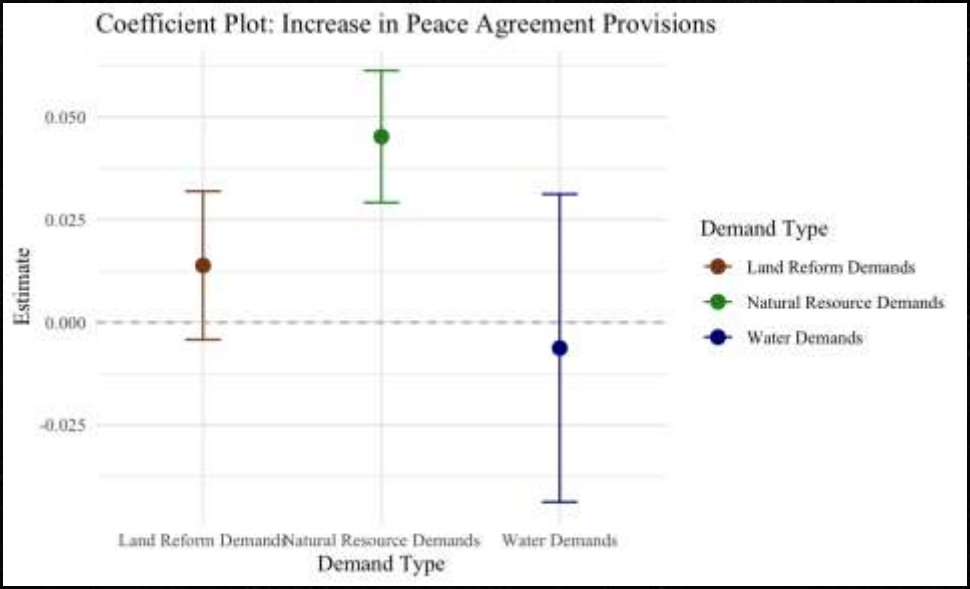
Climate Shocks & Rebel Demands: Land Reforms

- Increase in land reform demands



Climate Shocks, Rebel Demands & Peace Provisions

- Only Natural Resource Demands are Met



Consequences
Key Points

- Climate-induced migration not only drives but also exacerbates the nexus of crises
- Conflict resolution becomes even more crucial

Responses to Climate Migration

(and its consequences)

Research Question

- How should legal frameworks and policies respond to the challenges posed by climate-induced migration?

Responses to climate-related events, migration & conflict in the Anthropocene

- Climate Laws & their Effectiveness
    - Mitigation & Adaptation
- Peace Provisions & Laws
    - Peace Provisions & Climate Laws

CLIMATE LAWS & EFFECTIVENES

Addressing Vulnerability Through Law

- Mitigation & adaptation laws try to respond to the climate crisis
  - Are they working to increase climate resilience? Evidence from MENA.

Climate laws & resilience (MENA)

- Mitigation laws in MENA are working
- Adaptation Laws are not

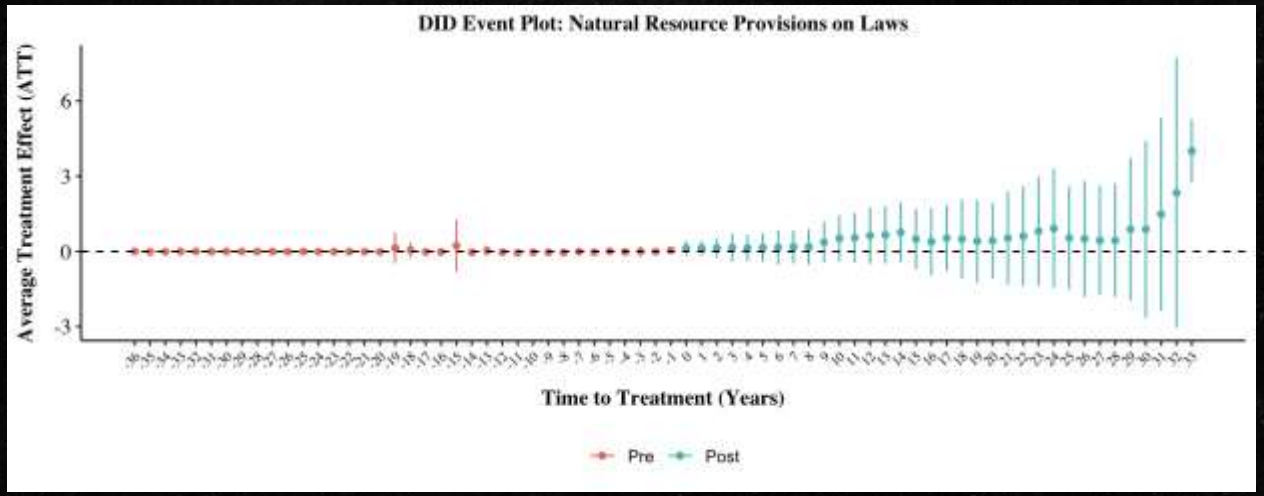
	GHG Emission	Adaptation Readiness
VARIABLES	(t+5)	(t+5)
Mitigation Laws	-1.91***	
	(0.68)	
Adaptation Laws		0.00
		(0.01)

PEACE PROVISIONS & LAWS

- When there are climate-related provisions in peace agreements, is there an increase in related laws?

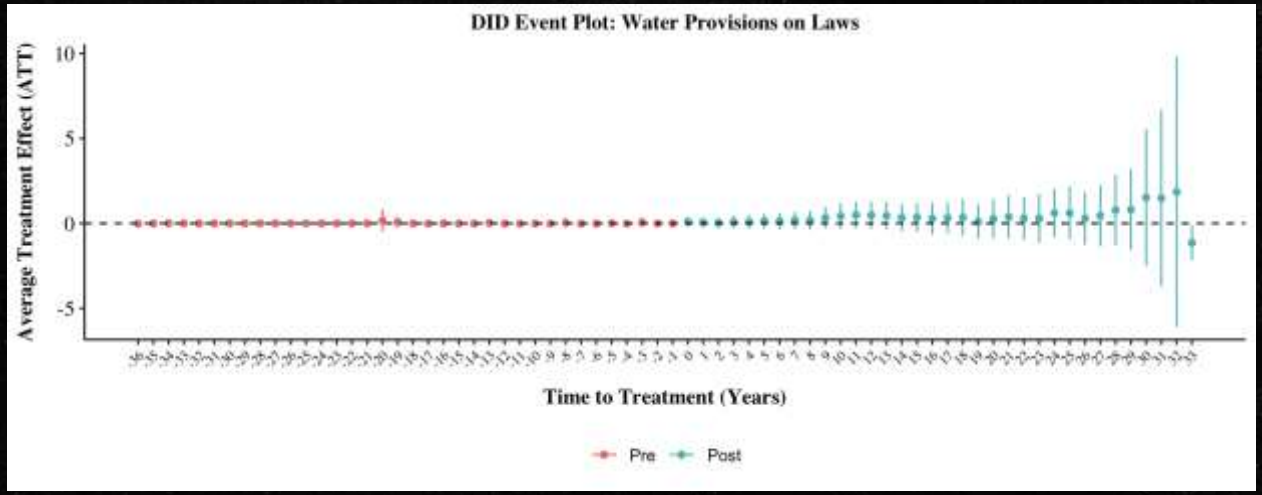
Are these provisions enacted in laws?

- Natural Resources
  - Upward Trend
  - Not SS



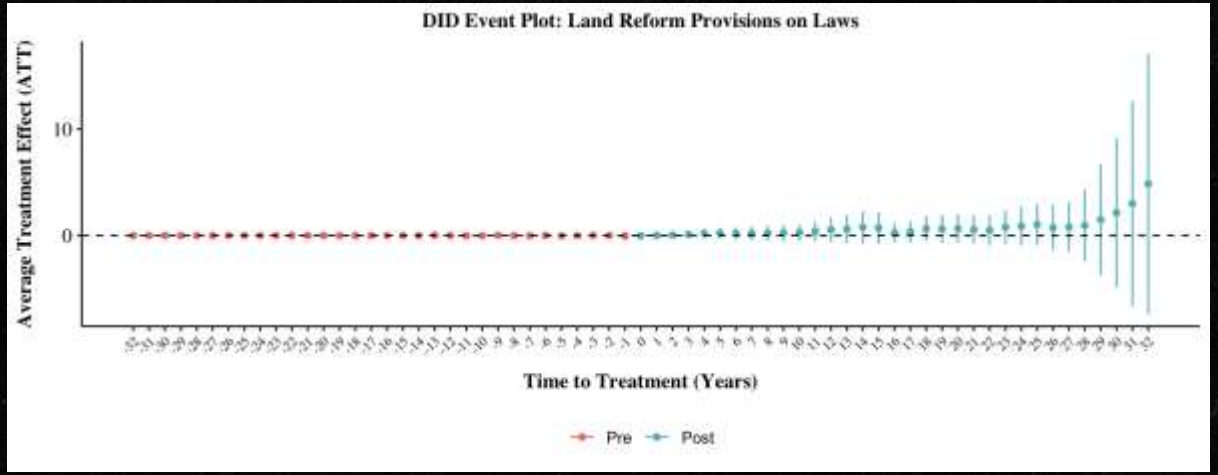
Are these provisions enacted in laws?

- WATER RESOURCES
  - Upward Trend
  - Not SS



Are these provisions enacted in laws?

- LAND REFORM
  - Upward Trend
  - Not SS



Responses
Key Points

- We need to make sure that our adaptation policies are working.
- Power sharing of resources among conflict zones should be addressed in order to keep the peace.

Working
& Future Agenda

Filling a scholarly gap in Anthropocene Mobility research

Climate Migration Instrument

Feedback Welcome!

- 1992-2023
- Instrumental variable to isolate climate-related migration
- **Significance:** This approach, at a global scale, provides unprecedented insights into climate-related migration specifically

- **Climate Disasters and Migration**: Capture the *immediate* consequences of climate disasters and resultant migration.
- **Spatial NN Proximal Analysis**: Map proximity between disaster-stricken regions and nearest cities. Uses ORM.
- **Validation with Nighttime Lights**: Exclude observations where nighttime lights patterns do not align with expected migration flows.
- **Urban Land Cover Integration**: Validate migration flow against urban land cover data.
- **Climate Migrant Text Analysis:** Web-scrape validation of news

GREEN DEVELOPMENT & CONFLICT

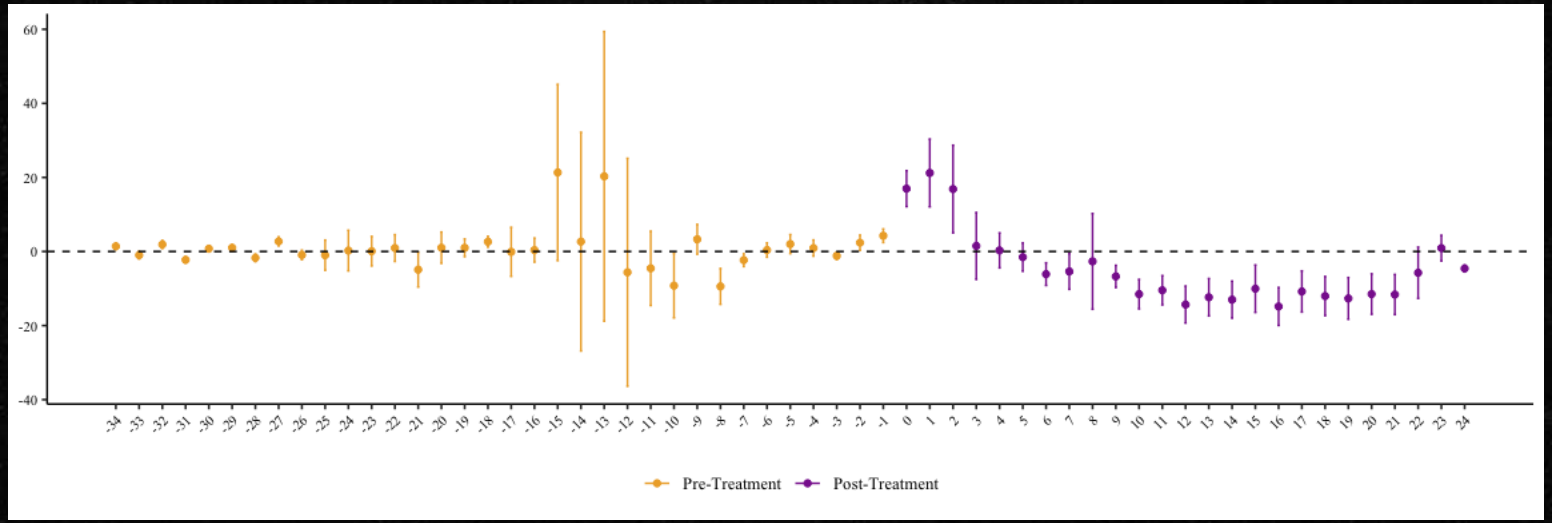
Feedback Welcome!

- Hydropower development shocks
- Events of conflict

- Can green development projects exacerbate existing vulnerabilities?

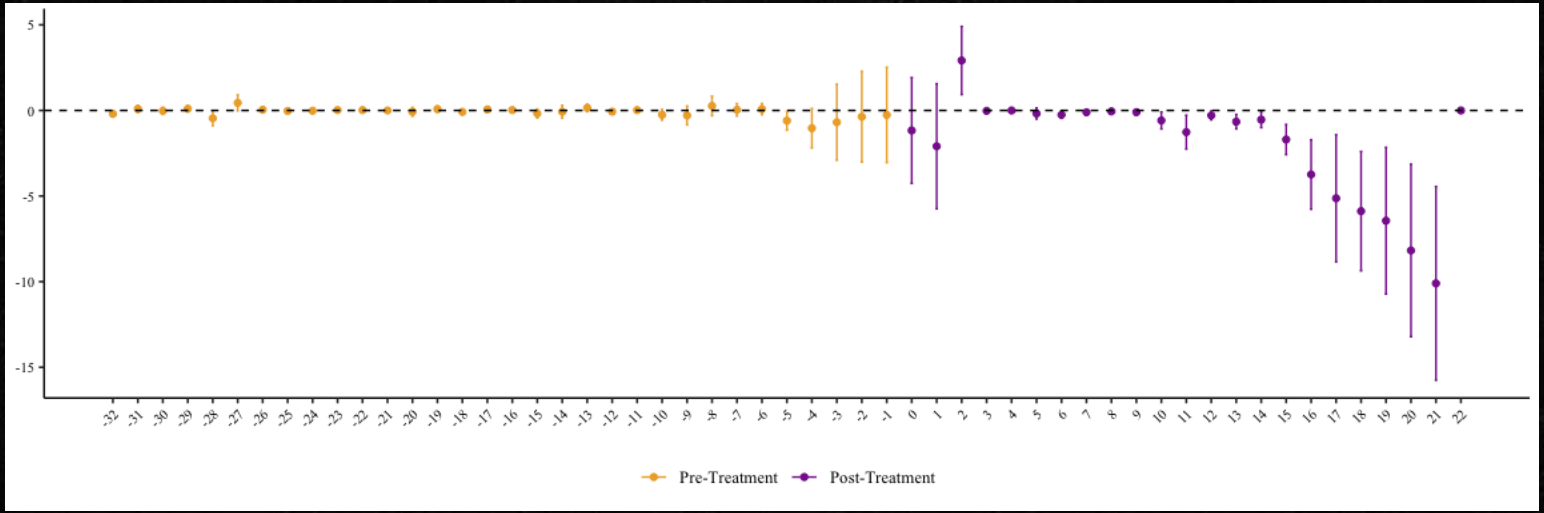
  What are the short- and long-term effects?

Colombia



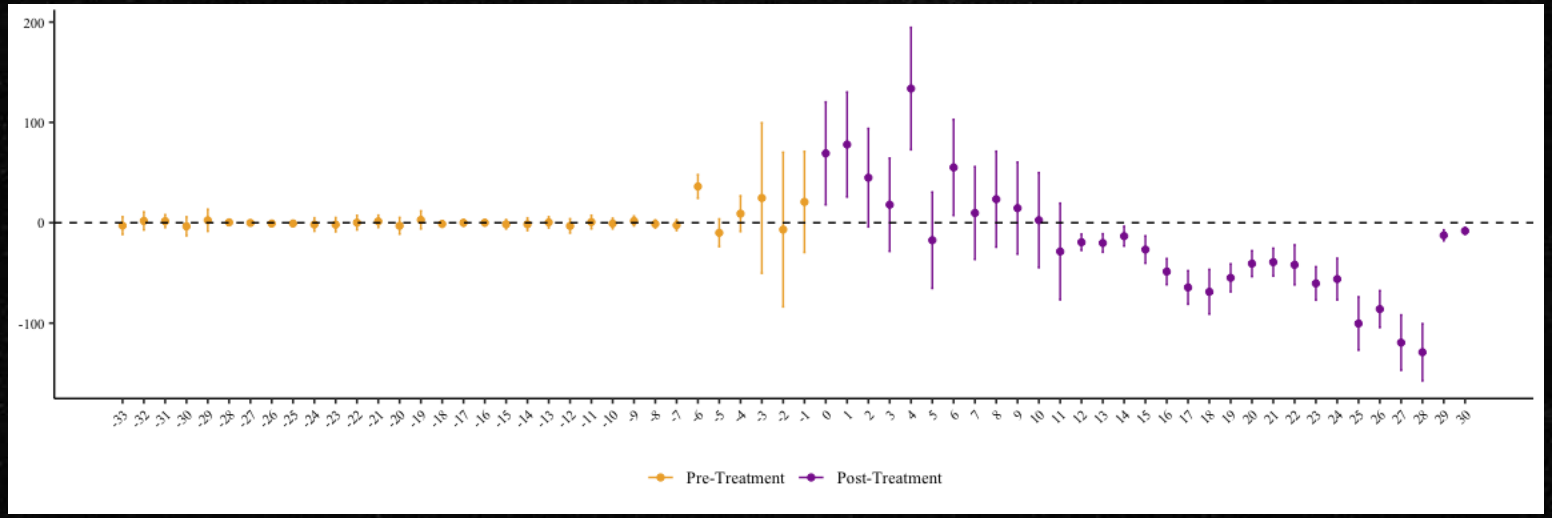
- Spike in Conflict: 1 year
- Drop in Conflict: 6 years

Mali



- Spike in Conflict: 3 years
- Drop in Conflict: 10 years

Pakistan



- Spike in Conflict: 1 year
- Drop in Conflict: 12 years

Concluding Remarks & Call to Action

Recap of findings

- Drivers: Climate Change as a push factor of migration
  - Sudden and Gradual Climate Mobility
- Consequences: Nexus of crises
  - Conflict & Conflict Resolution
- Responses: Adaptation policies & infrastructure
  - Legal Strategies
  - Resource Sharing

Policy Implications & Conclusions

1. **Strengthen Climate Laws:** Focus on robust adaptation strategies to address the immediate impacts of climate change, complementing existing mitigation efforts.
2. **Enhance Research & Innovation:** Invest in research to understand and address the drivers and consequences of climate migration, and develop innovative policies.
3. **Promote International Collaboration:** Foster global cooperation to manage the cross-border impacts of climate-induced migration effectively.
4. **Adopt a Holistic Approach:** Integrate strategies to tackle the interconnected challenges of climate change, migration, and socio-economic instability.

- **Conclusion:** Scholarship must be pivotal in shaping our responses, ensuring resilience and equity as we navigate the complexities of Anthropocene mobilities.

Call to action

- In the Anthropocene, **climate-induced migration is increasingly destabilizing global systems, intensifying existing crises** and vulnerabilities. **We urgently need more robust climate laws** and a reframing of our current approach. While mitigation efforts are increasingly common, adaptation strategies are vital as climate change is already here.

- **We call for enhanced research, innovative policies, and international collaboration to address these challenges.** Both scholars and climate policymakers must play a critical role in shaping our future responses, ensuring resilience and equity as we navigate the complex landscape of Anthropocene mobilities and their far-reaching implications.

Thank you

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