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War and water – coping with conflict- induced water shortage

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Leveraging Water for Peace, Oslo

Peace Research Institute Oslo

Independent • International • Interdisciplinary

Water and Peace



Water and Peace

Outline

- I. Water and development
- II. What do we know about water access and disputes?
 - a) International
 - b) Subnational/domestic
 - c) Local
- III. What do we know about impact of war on water?
- IV. Questions



Water Scarcity – What is it?

- Water scarcity usually defined as the imbalance between demand and available water supply, influenced by human behavior and physical water availability.
- Terms like water crisis, deficiency, stress, and shortage are used interchangeably, though not the same
- Water security focuses on ensuring access to adequate water for all, differentiating it from scarcity, which is more about availability vs. demand.
- The concept of water scarcity varies across disciplines, but a broad approach is adopted for analysis, considering different societal levels and factors.
- Water scarcity is relational, depending on human agency, societal norms, and varies by geography, income, ethnicity, etc.

What do we know about water access and disputes?



LE MONDE *diplomatique*

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> July 2023

CLIMATE CHANGE AND THE POLITICS OF WATER

How can we avoid water wars?

Heat, War and Trade Protections Raise Uncertainty for Food Prices

Experts are warning of a new normal in which food supplies and prices — could be rocked more regularly.

Climate change is making armed conflict worse. Here's how.



UTRIKES

Konflikt i spåren av
klimatförändringar

War between countries over water?

- Note: here summarizing general findings from statistical analysis (so called Large-N research) within in peace and conflict studies
- High-quality datasets like the Transboundary Freshwater Dispute Database have emerged, examining water-related conflicts and cooperation at various levels, from international to domestic and even subnational scenarios.
- Overall, studies suggest that violent conflict between countries almost never related to water issues
 - *Instead, tensions more likely leading to diplomatic agreements rather than armed conflicts, challenging the notion of "water wars."*
 - *Collaboration more likely, especially in river basins with water allocation treaties or institutional solutions.*
 - *Institutions mitigate water disputes, e.g. water treaties can promote peace but may require third-party support or enforcement mechanisms within the treaties*

War Collaboration between countries over water



- Within-country relationship between cooperation and conflict over water more complex, as government collaboration at higher levels can sometimes undermine local achievements
 - *highlighting the intertwined nature of water cooperation and conflict and the importance of including civil society and grassroots organizations in understanding interstate relations.*

Wars within countries over water?

- Rapid expansion of research on climate-related hazards and conflict risk
- Indirect influences: shocks to rural living conditions, food/livestock price changes.
- Debate on climate-related migration as a conflict driver.
- Climate effects on conflict vary across space and time

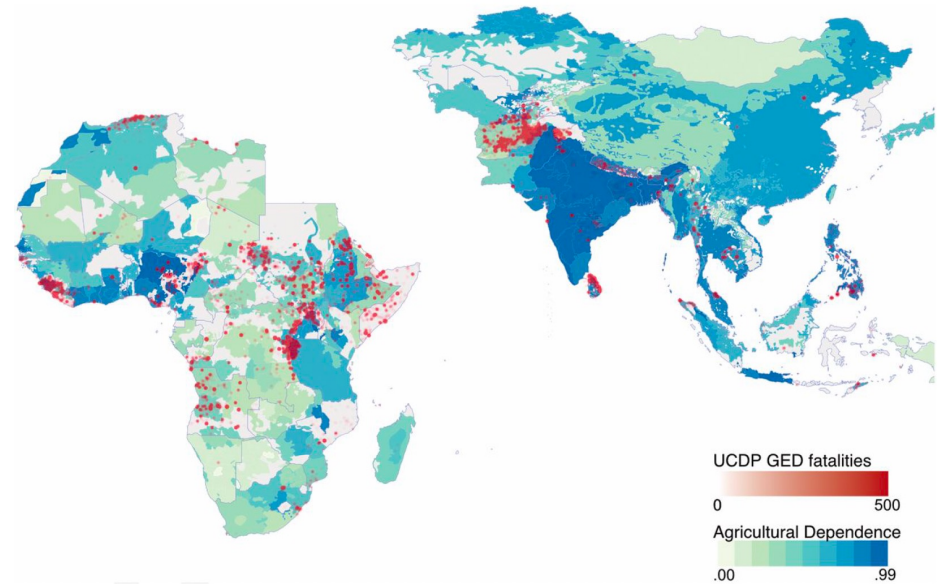


Image from: Von Uexkull et al (2016). Civil conflict sensitivity to growing-season drought. *PNAS* 113(44), 12391-12396. This shows agricultural dependence by ethnic group settlement area and location of armed conflict events according to the Uppsala Conflict Data Program (UCDP) GED dataset, 1989–2014.

Wars within countries over water?

General factors increasing negative impacts: magnitude of shocks to resources and social vulnerability

Countries/regions like Somalia, the Philippines, Indonesia, and India affected by climatic shocks.

Role of public goods provision and infrastructure.

Large-scale shocks may decrease conflict activity.

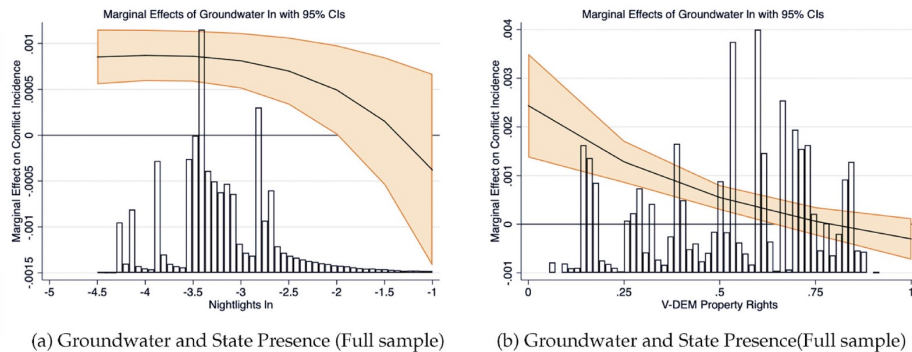


Fig. 6. Communal Violence as a function of Groundwater and State Presence.

Figure a) and b) show the average marginal effects for conflict as a function of groundwater access and state presence, measure as nighttime emission and V-DEMs measure for property rights. Both figures show the effects for the full sample. The subplots show the distribution of the variables.

Image from: Döring 2020. *Come rain or come wells: How access to groundwater affects communal violence.* In: *Political Geography* Vol. 76, 102073

Image from: Yan Uexkull et al (2016). Civil conflict sensitivity to growing-season drought. *PNAS* 113(44), 12391-12396.
This shows agricultural dependence by ethnic group settlement area and location of armed conflict events according to the Uppsala Conflict Data Program (UCDP) GED dataset, 1989-2014.

Wars within countries over water?

- Intrastate conflict studies, focusing on disputes within countries, find no clear empirical link between water scarcity and violent conflict, suggesting democratic institutions can act as buffers in times of scarcity.
- Recent research using precipitation measures to study the relationship between water access and conflict indicates that significant water shortages are not directly linked to the risk of violent wars
 - *Conditional on by infrastructure and dependency on agriculture*

Conflict at the local level

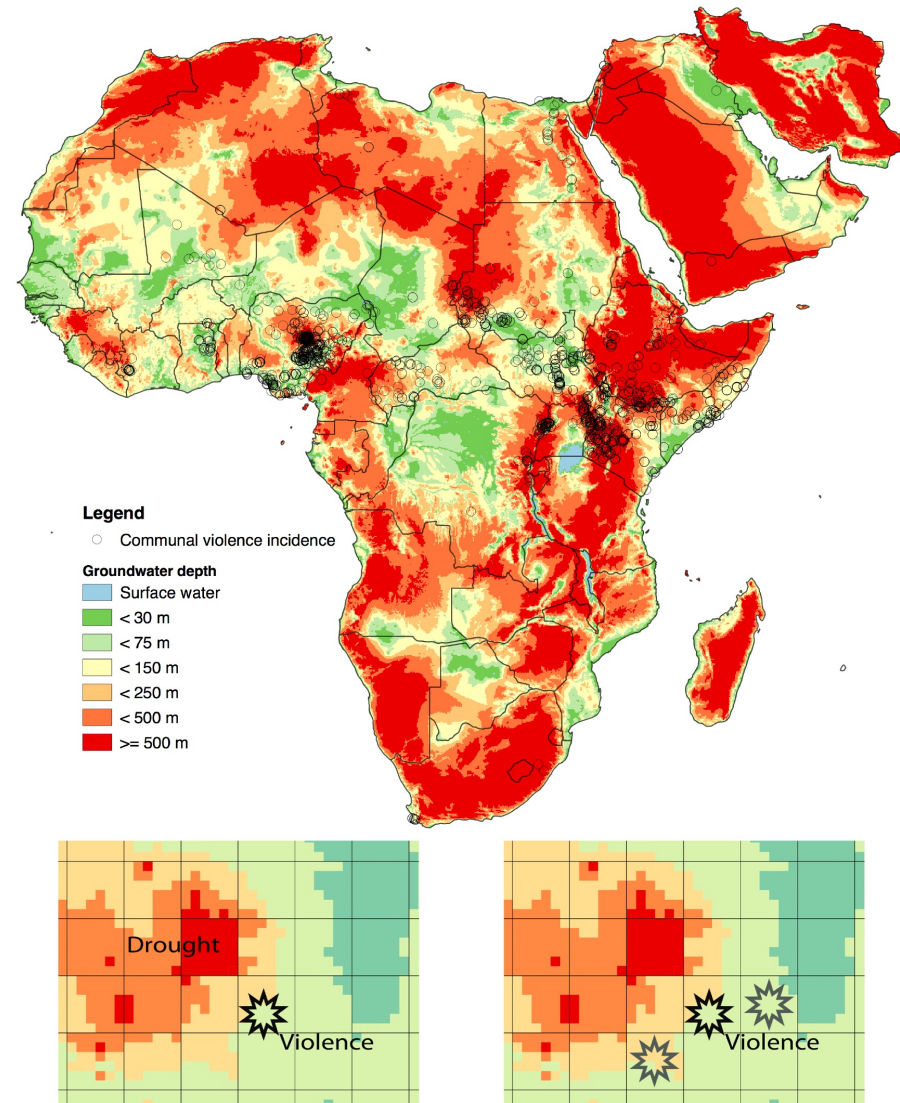


For example: pastoralist groups (focus here), but also protests, mobs, other less-formally organized groups

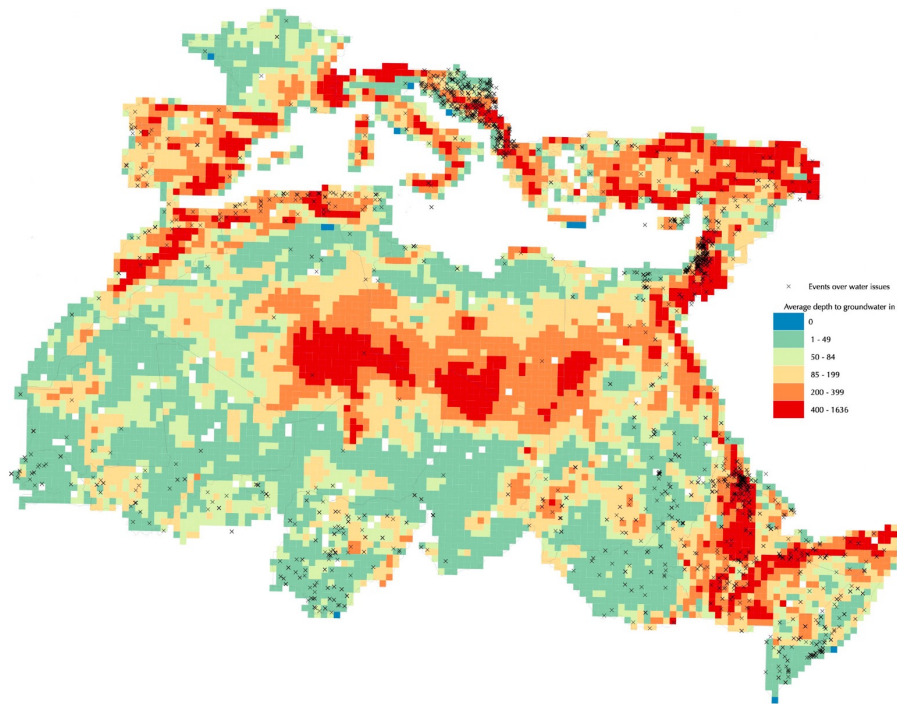
- Communal conflict, between informally organized groups mobilized along identity.
- Water scarcity (environmental degradation generally) can be a driver for disputes among communal groups
- *Even here conditional on socio-economic conditions and access to resources.*
- Marginalized groups are especially vulnerable to communal violence due to socio-economic and political exclusion
 - *shocks like drought exacerbate tensions; legal reforms affecting land ownership.*
- Local governance and institutions play a crucial role in conflict dynamic
- *Strong local governance can reduce conflict risk, while unclear judicial systems or intermediate state capacities may increase violence. Community leaders and traditional resolution mechanisms are essential in mitigating conflict escalation.*

Conflict at the local level

- *Water scarcity, especially groundwater, can directly increase armed conflict, not just through indirect/conditional channel*
- *Drought impacts violence not locally but through wider neighborhood exposure (spillover mechanism)*



Cooperation at the local level

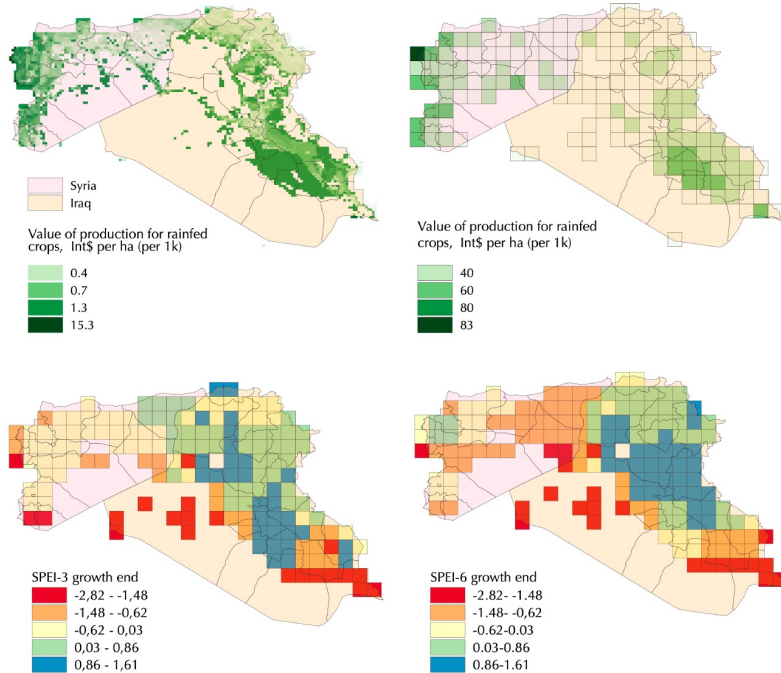


Döring, 2020b. From Bullets to Boreholes: A Disaggregated Analysis of Domestic Water Cooperation in Drought-prone Regions in: Global Environmental Change.

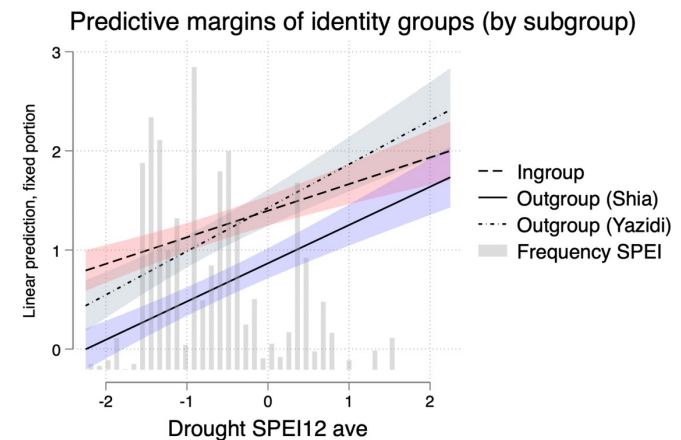
- *Water cooperation more likely in areas with difficult access to groundwater and with a history of violence*
 - *Effect stronger in more democratic countries*
 - *With strong liberal democratic norms, cooperation over water even occurring without state involvement (suggestive)*



Cooperation at the micro level



- *Drought exposure associated with decreased cooperation (measured as altruism)*
 - *group identity conditions the relationship*
 - *Identities shaped through conflict are key*



Döring & Hall, 2023. Drought exposure decreases altruism [...]. Published in Nature Climate Change, Issue 13.

Impact of War on Water (and society)

- Water provision is critical in humanitarian responses during war, essential for both daily needs and various economic sectors, especially agriculture.
- Useful to distinguish direct vs indirect impacts
- Direct impacts include the deliberate destruction of water infrastructure during armed conflict
 - *deteriorating water quality and quantity, and restricting access and provision.*
 - *International declarations recognize water as a basic human right and prohibit actions that disrupt water services.*
- Wars cause deterioration in water quality through infrastructure damage and contamination, affecting drinking water systems, agriculture, and ecosystems, leading to widespread economic and societal impacts.
- War directly influences the management of transboundary river basins (negative impacts on cooperation as outlined earlier)

Indirect impact of War on Water (and society)

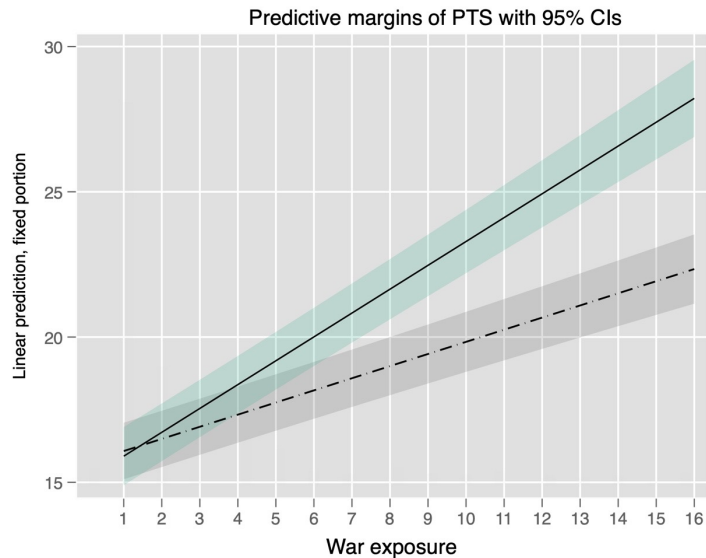
- Wars disrupt access to water by impacting grid supply, leading to reduced piped water supply, power outages, and increased contamination from industrial facilities, undermining water quality and quantity.
 - *Conflict increases water scarcity by disrupting infrastructure maintenance and reducing resource management efficiency, with long-lasting impacts that can take decades to restore, as seen in Sudan, Somalia, and Syria.*
- Warfare induces dissaving by impacting personnel maintaining water services and deteriorating water infrastructure, leading to unregulated, informal water provision businesses that may over-exploit water resources and increase pollution.
- In times of war, military construction projects often neglect environmental protection guidelines, affecting water-catchment areas and leading to pollution of lakes, rivers, and groundwater, with long-lasting impacts on ecosystems.
- Water insecurity impacts health and wellbeing directly and indirectly, with deficient access to WASH increasing the risk of diseases and infections.
 - *Conflict diminishes access to water for hygiene, affecting displaced persons and refugees severely.*
- Warfare increases the distance to fetch water, placing a disproportionate burden on women and girls and potentially exposing them to gender-based violence, increasing mental health burdens, and causing disputes over water access.

However, evidence base a bit thin: Lack of systematic research on the impact of war on water resources and their longer-term societal outcomes, with the magnitude of impacts largely unknown.

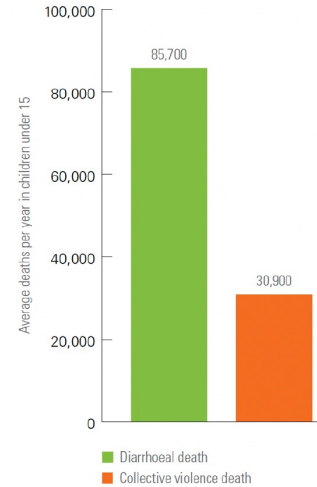
Research in progress

UNICEF and WHO estimates:

- Children under 15 are nearly 3 times more likely to die from diarrhoeal disease linked to unsafe WASH than violence in conflict
- Children under 5 are more than 20 times (!!) more likely to die from diarrhoeal disease related to unsafe WASH than violence in conflict

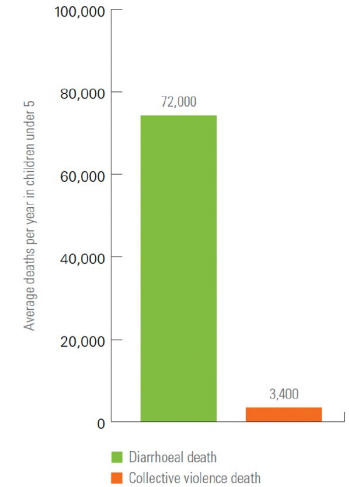


Children under 15:
Deaths from diarrhoea linked to unsafe WASH and deaths from collective violence



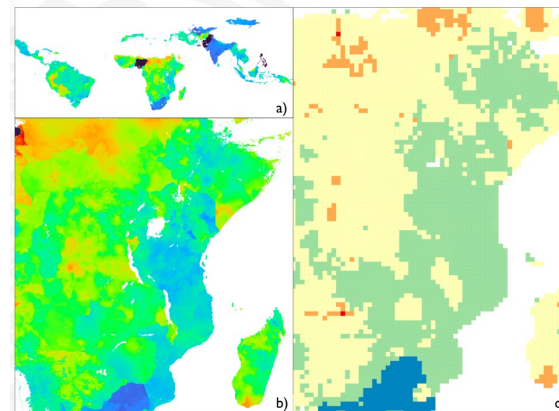
Notes: Afghanistan, Burkina Faso, Cameroon, the Central African Republic, Chad, the Democratic Republic of the Congo, Ethiopia, Iraq, Libya, Mali, Myanmar, Somalia, South Sudan, Sudan, the Syrian Arab Republic and Yemen. Data are the average for 2014–2016.

Children under 5:
Deaths from diarrhoea linked to unsafe WASH and deaths from collective violence



Notes: Afghanistan, Burkina Faso, Cameroon, the Central African Republic, Chad, the Democratic Republic of the Congo, Ethiopia, Iraq, Libya, Mali, Myanmar, Somalia, South Sudan, Sudan, the Syrian Arab Republic and Yemen. Data are the average for 2014–2016.

From: UNICEF 2019. Water under fire



Data from Institute for Health Metrics and Evaluation

► Outcome: Under-5 Diarrhea Incidence

- 5x5 km-level for 94 low- and middle-income countries (LMICs), 2000–2019
- Aggregate w/ mean and max values per PRIO-GRID

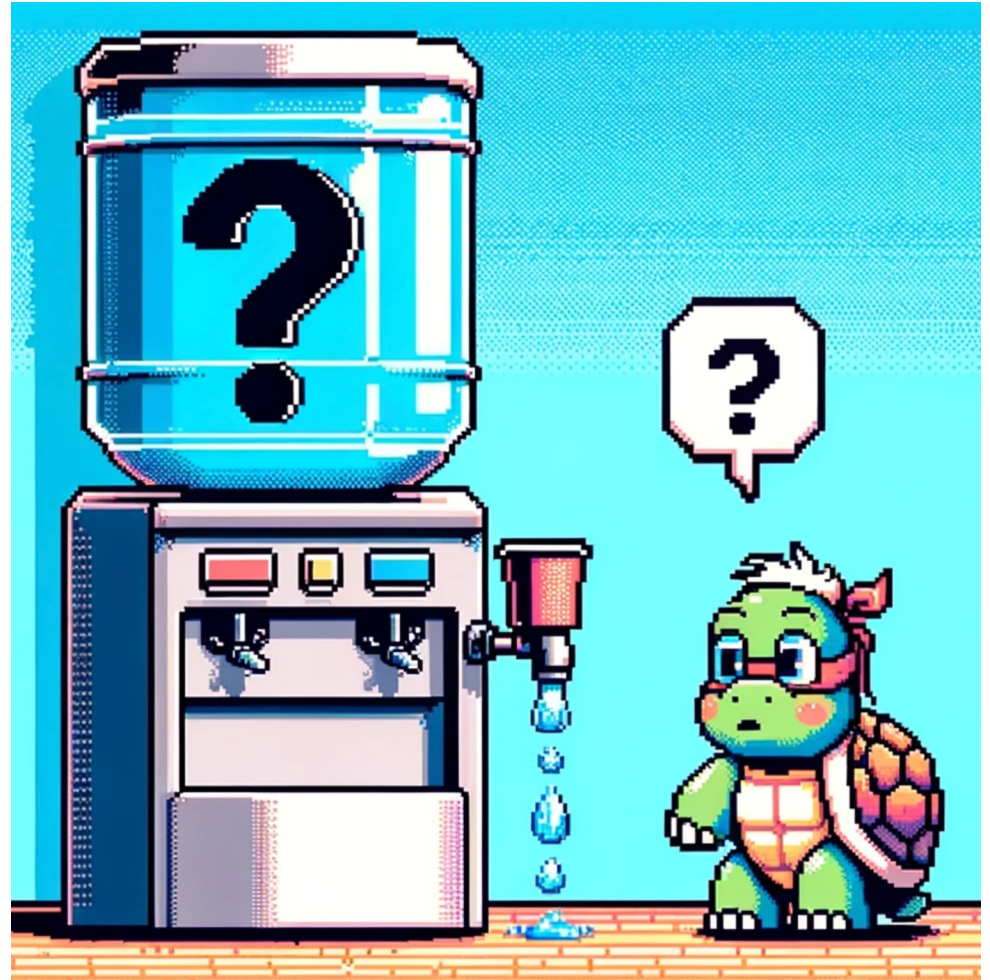
► Main independent variables:

- Critical infrastructure data (time invariant)
 - UCDP-GED incidence
 - Estimation: Hierarchical, random effects model w/ intercepts at cell and country level
- **Next:** drought, water quality data

Questions?

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Further reading

Research by the presenter:

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- Wolf, A. T. (2007). Shared Waters: Conflict and Cooperation. *Annual Review of Environment and Resources*, 32, 241–269.