CLIMATE CHANGE AND MIGRATION

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OVERVIEW

- Note the stark contrast between statements and recent evidence
- The refugee crisis and growing public concern with migration that has seen political upheaval and the rise of populism has lead to a flurry of new research
- Provide a brief overview of the recent research and speculate on the contrasting views

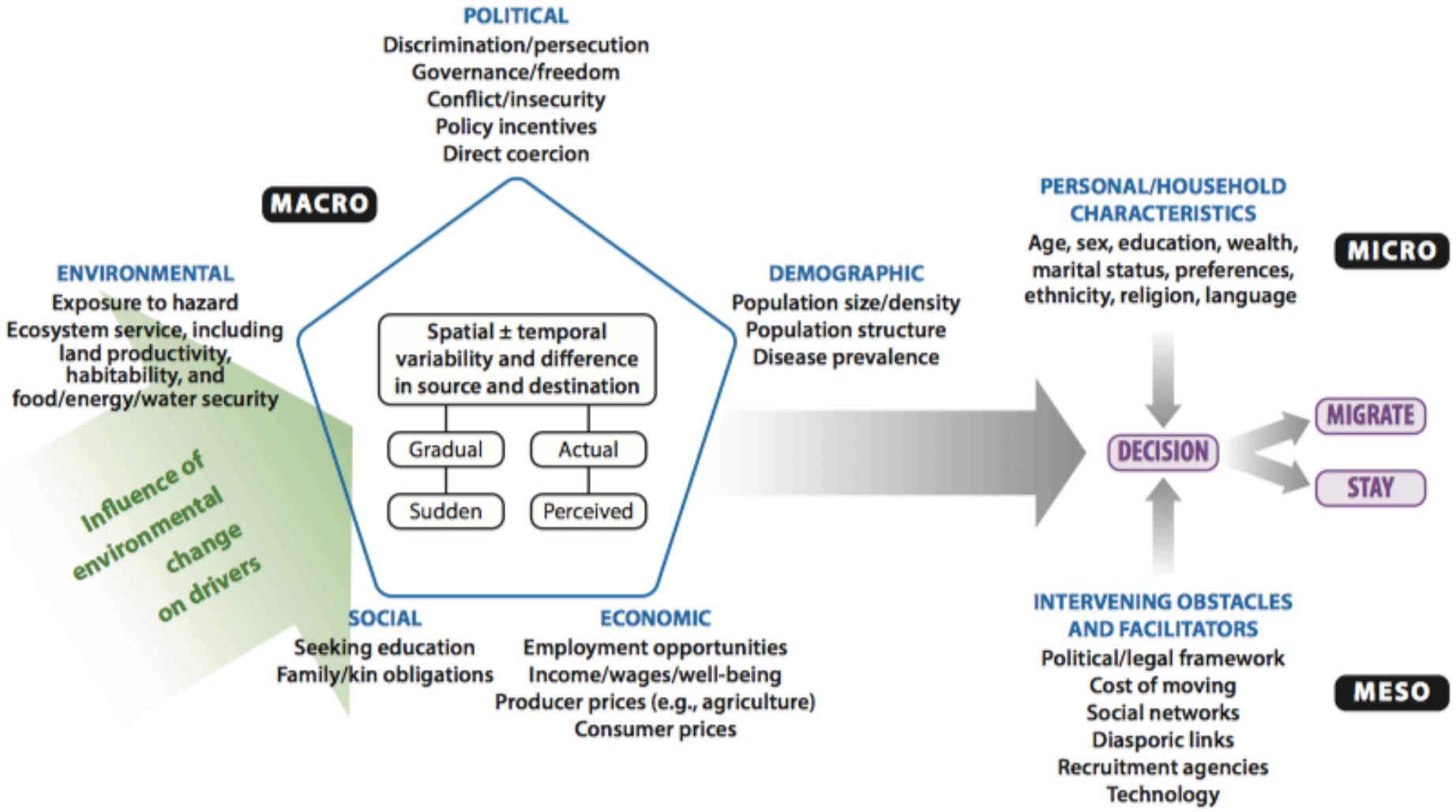
WELL KNOWN STATEMENTS

- "the gravest effects of climate change may be those on human migration as millions will be displaced" IPCC, 1990
- The Stern Review states that "severe deterioration in the local climate could lead, in some parts of the developing world, to mass migration and conflict"
- The NGO Christian Aid predicted that up to one billion people could be displaced by environmental causes by 2050 (Christian Aid 2007).
- "Climate change is projected to increase displacement of people (medium evidence, high agreement)" IPCC, 2014

HISTORIC MIGRATION AND CLIMATE

- Archeological evidence indicates that periods of drastic climatic change coincided with the collapse of past civilizations
- Urban centers of the Harrapan Society in the Indus Valley, now in Pakistan, were abandoned during a 200-year drought (Marris 2014)
- There have been population movements to more favourable areas to increase chances of survival (Riehl et al. 2014).

Conceptual framework of drivers for migration (Black et al. 2011, p. S5)



CHANNELS DISCUSSED HERE

- Conceptual framework shows a complex set of interconnected drivers of migration
- Focus here on the effect of climatic events:
  1. Directly on migration and through its impact on income
  2. Through its impact on conflict
  3. In context of demographic changes and their impact on income differentials

CLIMATIC EVENTS => MIGRATION
&
CLIMATIC EVENTS => INCOME

Not easy to distinguish

CLIMATE CHANGE, CLIMATIC EVENTS, INCOME

- **More frequent periods of warm temperatures**: extreme temperatures directly affect income and livelihood
- **More frequent droughts**: lower agricultural productivity, labor productivity, and health
- **More frequent floods**: destruction of infrastructure and loss of lives, floods displaced 22 million people per year since 1985
- **More heavy storms**: "American Dust Bowl" (1934-40) large dust storm led to severe erosion of top soil and made large areas of American Plains unsuitable for agriculture
- **Sea level rise**: between 1 to 5 meters and currently 600 million people living on low-elevation zones
- **Long-term increases in mean temperature**: dry out soils and reduce or stop plant growth

CC=>INCOME=>MIGRATION

- Rich evidence on the effect of climate change on income especially agriculture
- Changes in income are routinely seen as a main driver of internal and international migration patterns (e.g., Borjas 2014)
- Differences in income shape migration patterns
- To the extent that climate change alters people's current or future income migration may be affected
- Decreases in income may lead to increased migration but in developing markets with credit constraints may actually reduced migration

EMPIRICAL EVIDENCE OF CLIMATIC EVENTS AND MIGRATION

- Barios et al. (2006) study find that a decline in rainfall in Sub-Sharan Africa increase internal migration (rural to urban)
- Beegle et al. (2011) use rainfall deviation over 10 years for Tanzanian households and found a significant impact of rainfall shocks on migration
- Robalino et al. (2014) find that natural disasters increase the number of migrants except when they are especially severe
- Several studies show a negative effect of disasters on migration
- Overall recent empirical local studies confirm that environmental change acts as a push factor though impact depends on country and region and results difficult to generalize outside particular country (Millock 2015).

CLIMATIC EVENTS => INTERNATIONAL MIGRATION

- Beine & Parsons (2015) consider both sudden-onset environmental factors like natural disasters and slow-onset climatic factors (changing temperatures and rainfall deviations from mean)
  - Results show no evidence of a significant effect of either temperature or rainfall deviations or anomalies on international bilateral migration flows.
  - However, explicitly focus on 'direct' effects of climatic events on migration and not 'indirect' effects like impact on wages

CLIMATIC EVENTS => INTERNATIONAL MIGRATION

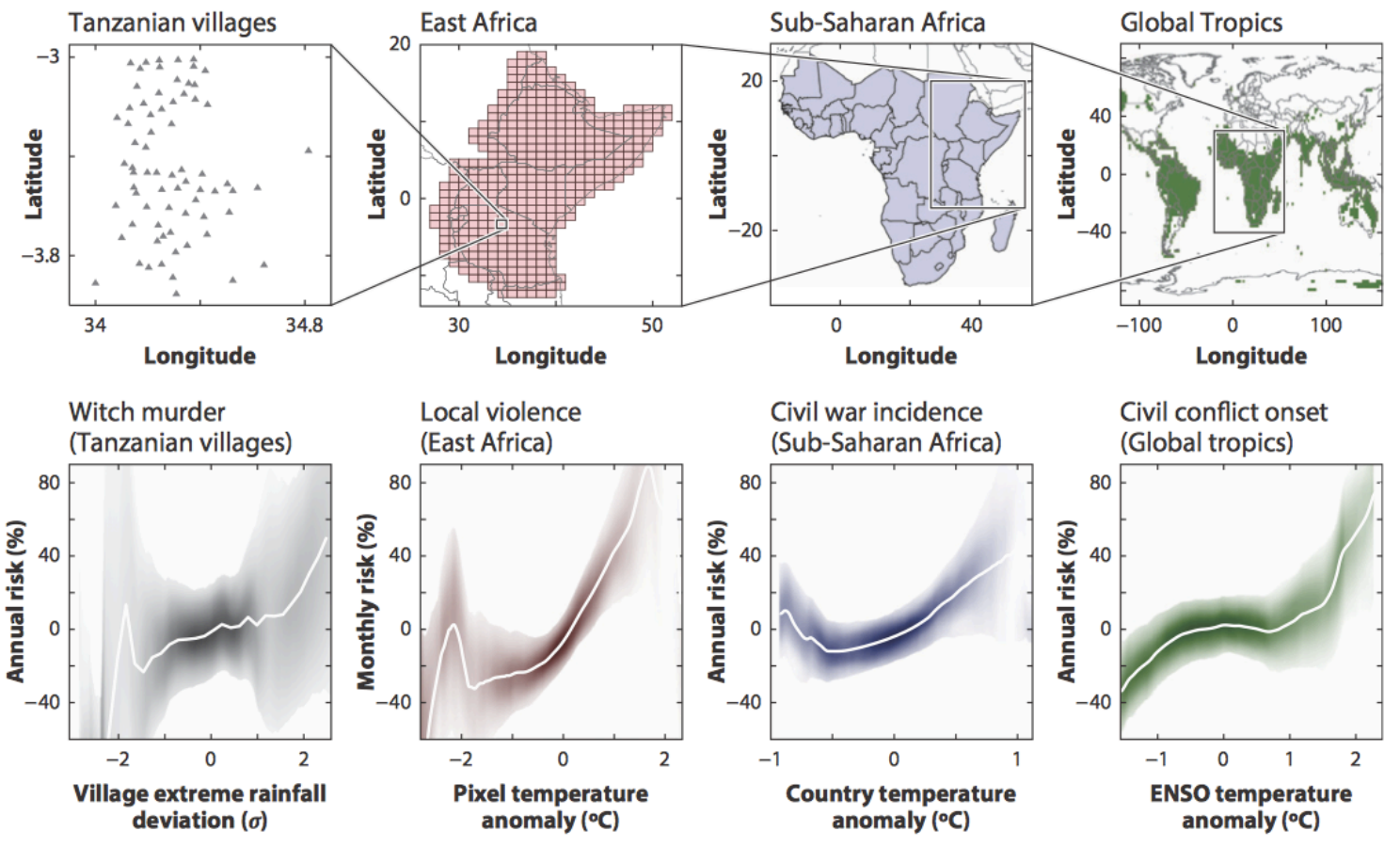
- Cattaneo & Peri (2016) in contrast use average temperate changes (rather than deviations) and explicitly focus on total effects (through agricultural income)
  - Results show significantly higher emigration rates in middle-income countries and lower in poor
  - Emigration not to OECD countries

CLIMATIC EVENTS => CONFLICT

CLIMATE =>CONFLICT (MECHANISM)

- Conflict: events for which normal patterns of dispute resolution fail (interpersonal conflict, intergroup, population collapse)
- Attention of economists mostly on way that climatic conditions adversely affect economic conditions and living standards: a temporary reduction in productivity (e.g., agriculture) reduces the current opportunity cost of conflict
- With fewer resources (taxes revenues) a government/leader may become weaker and more vulnerable to attack
- Alters psychological rewards/costs: domestic violence, assaults, rape and murders increase during hot days, weeks, months (lab experiments too)

RICH VARIETY OF EMPIRICAL RESULTS



CLIMATE =>CONFLICT (EVIDENCE)

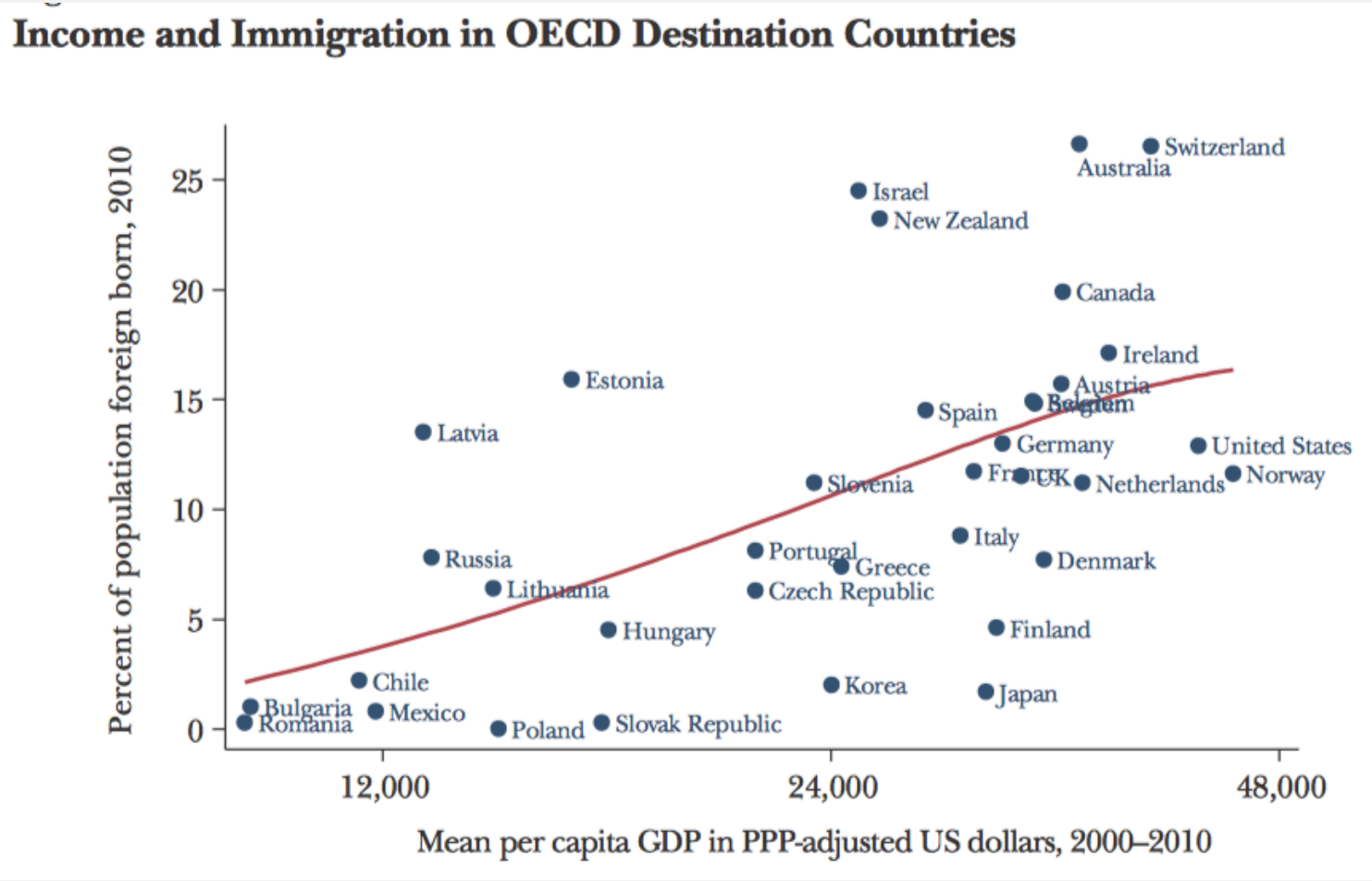
- The combined results of 50 studies (Burke et al. 2015):
  - 1σ rise in a location's temperature is associated with
    - an average 2.1% net increase in the rate of interpersonal conflict
    - 11.3% increase in the rate of intergroup conflict
- "suggest that amplified rates of human conflict could represent a large critical impact on anthropogenic climate change"
- Warming could increase armed conflict incidence by 54% in the coming decades (Burket et al. 2009).
- Conflict in Syria has coincided with a record drought in the Fertile Crescent made 2-3 times more likely by CC (Kelley et al. 2015)

DEMOGRAPHICS, MIGRATION AND CLIMATE CHANGE

DEMOGRAPHICS, MIGRATION AND CLIMATE CHANGE (HANSON 2016)

- Fundamental concept in economics of immigration is that international labor flows are driven by differences in income among countries
- United States is by far and away the dominant destination country for international migration (in 2010 41.6% of all foreign-born living in an OECD country)
- Distant runners up: Great Britain, with 7.9 percent of the working-age immigrants that reside in OECD countries; Spain, with 6.2 percent; and Canada, with 6.0 percent.

GDP AND IMMIGRATION IN OECD DESTINATION COUNTRIES



MEXICO-TO-US MIGRANT FLOW (PAST)

- A single source country, Mexico, accounts for just one-third of US working-age immigration
- The Mexico-to-US migrant flow is one of the largest international migration episodes that the world has seen
- Financial crises, political upheaval and military conflict are common triggers for migration episodes but sustained international migration fueled by divergence of economic conditions between origin and destination country
- The onset of the Mexican debt crisis of the 1980s and stagnation that followed sparked the flow to the US

MEDITERRANEAN THE NEW RIO GRANDE?

- The European immigration context today looks much like the US did three decades ago: demographic transition to low birth rates and declines in fertility in the 70s and 80s set stage for absolute decline in number of working-age residents
- Profound political and economic upheaval in North Africa and the Middle East (triggers) are happening in a demographic environment ideal for perpetuating emigration. Population growth is proceeding apace in sub-Saharan Africa and much of North African and the Middle East
- The coming half century will see absolute population growth in sub-Saharan Africa five times as large as Latin America's growth over the past half century.
- The migration safety valve may not operate for the next century's population growth in the way it did in the past century.

CONCLUDING THOUGHTS

- Most recent empirical evidence on climate change migration link contrasts with statements of dramatic impacts in part because:
- (a) draw on recent climatic events that may be poor projectors of future
- (b) focus on direct impact of climate change on migration that suggests some evidence of rural to urban but not international migration
- (c) may not add up many indirect paths like climate change impact on economic conditions, conflict, or account for context (demographics) and triggers
- (d) focus on most likely scenario versus extreme, e.g., 6°C
- Humanitarian problem may be greater if safety valve of migration not an option for adaptation

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COUNTING FIRST-GENERATION MIGRANTS IN 2010

USA	32,783	15.7%	41.6%
Great Britain	6,208	15.0%	7.9%
Spain	4.880	15.3%	6.2%
Canada	4.697	19.8%	6.0%
France	4.569	11.2%	5.8%
Italy	4.120	10.6%	45.2%

Origin Destination Dyad

Germany	Turkey
	Poland
	Russia
	Kazakhstan
Italy	Romania
	Albana
	Morocco
Mexico	USA
	Guatemala
	Colombia
France	Algeria
	Morocco
	Portugal
Spain	Romania
	Morocco
	Ecuador
Great Britain	Poland
	India
	Pakistan