

The shadow of the *future* and the shadow of the *past*: Studying the impact of climate change on human behaviour

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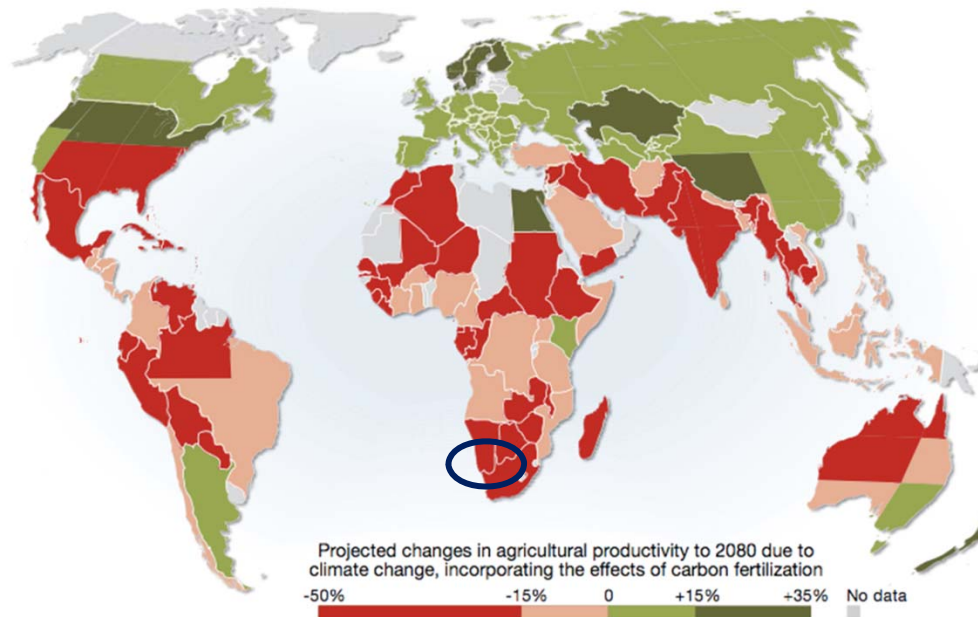
Outline

- * How environmental factors influence behavior: An example from Namibia (slow environmental change)
- * Ongoing work:
 - * Shadow of the past: Philippines
 - * Shadow of the future: Solomon Islands and Micronesia
- * Climate change and migration: Narratives matter.

How do environmental factors affect human behavior? An example from Namibia

Motivation

- * Projected gradual change in agricultural productivity to 2080 due to climate change (Source UNEP/GRID-Arendal)



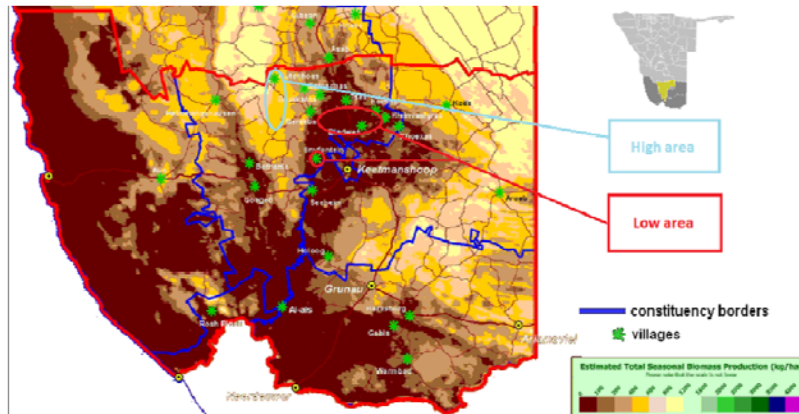
- * Resource scarcity further aggravated by population growth

Resource scarcity and antisocial behavior

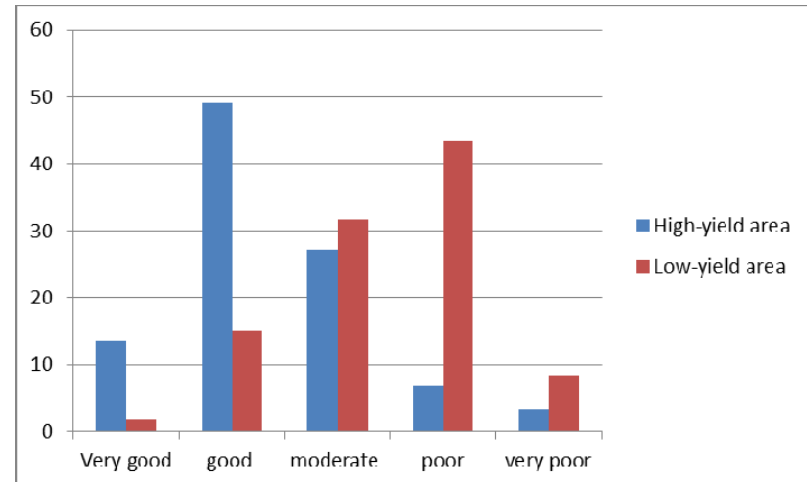


Biomass production as proxy for scarcity

Satellite image of average annual biomass production in last 23 years



“How do you rate the availability and quality of your pastures?”



Moving the lab to the field... observing behavior in a controlled environment



- Testing fundamental human behavior (risk aversion, time preference, trust and cooperation)
- Analyzing human behavior in markets and institutions



- Adding cultural, socio-political, environmental context

The Joy-of-destruction minigame

- Two players (anonymous villager, one-time decision)



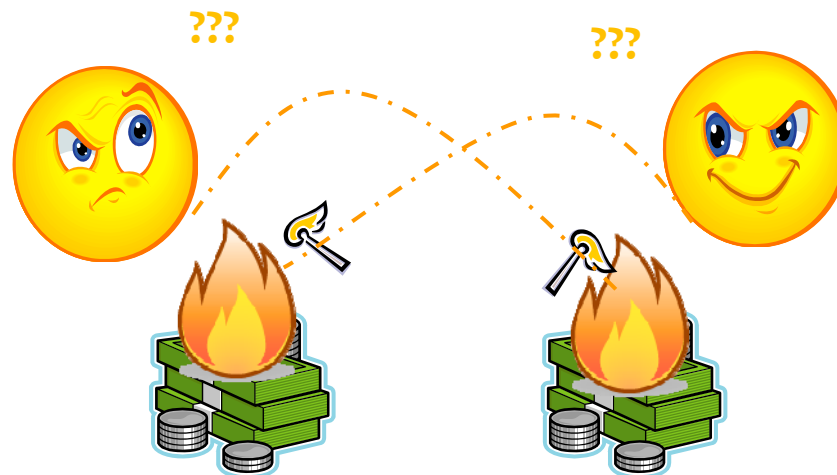
The Joy-of-destruction minigame

- Two players (anonymous villager, one-time decision)
- Each receives N\$ 10



The Joy-of-destruction minigame

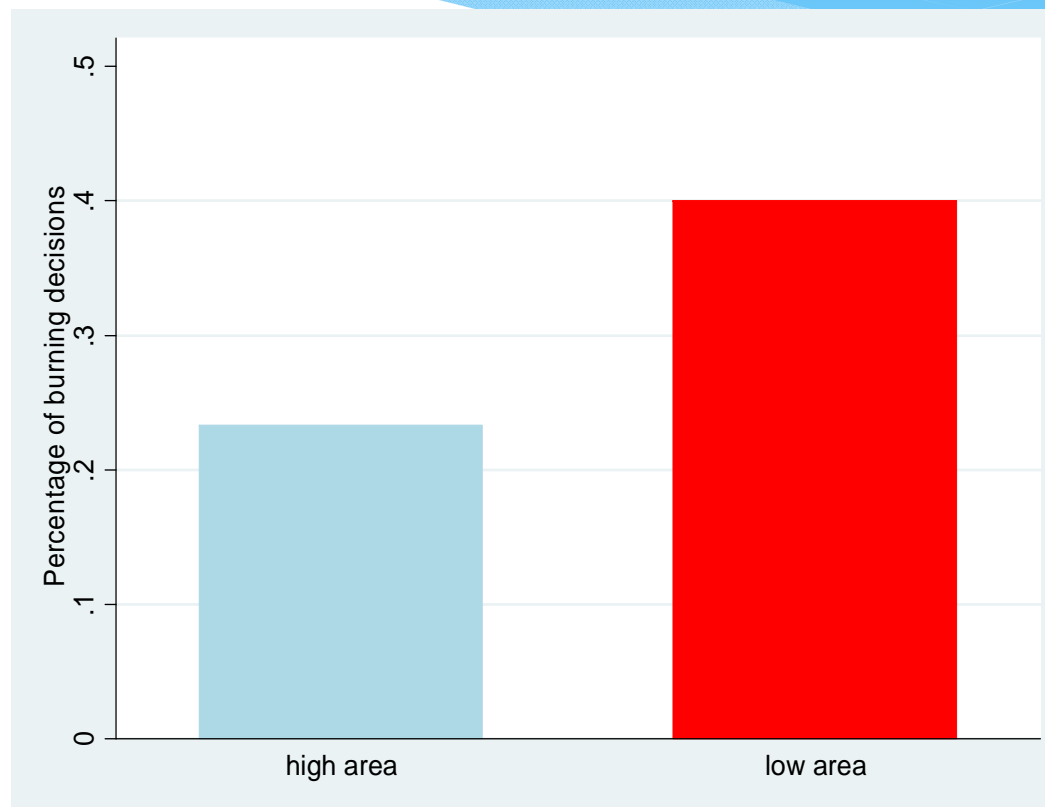
- Two players (anonymous villager, one-time decision)
- Each receives N\$ 10
- Players decide simultaneously whether to “burn” N\$ 5 of the other player
- It costs N\$ 1



The Joy-of-destruction minigame

- * People can hurt each other, but we have removed all conventional reasons to do so
 - * No material gain is achieved
 - * No wrongdoing is punished
 - * No inequality is reduced
 - * Anonymity prevents social comparison and status seeking
- * Stealing or sabotage more common in real life. Examples could be e.g. suicide bomber or divorce battle

Main result



- Burning rates almost twice as high in low-yield area (40% vs 23%), Fisher's exact: $p=0.04$, $n=120$

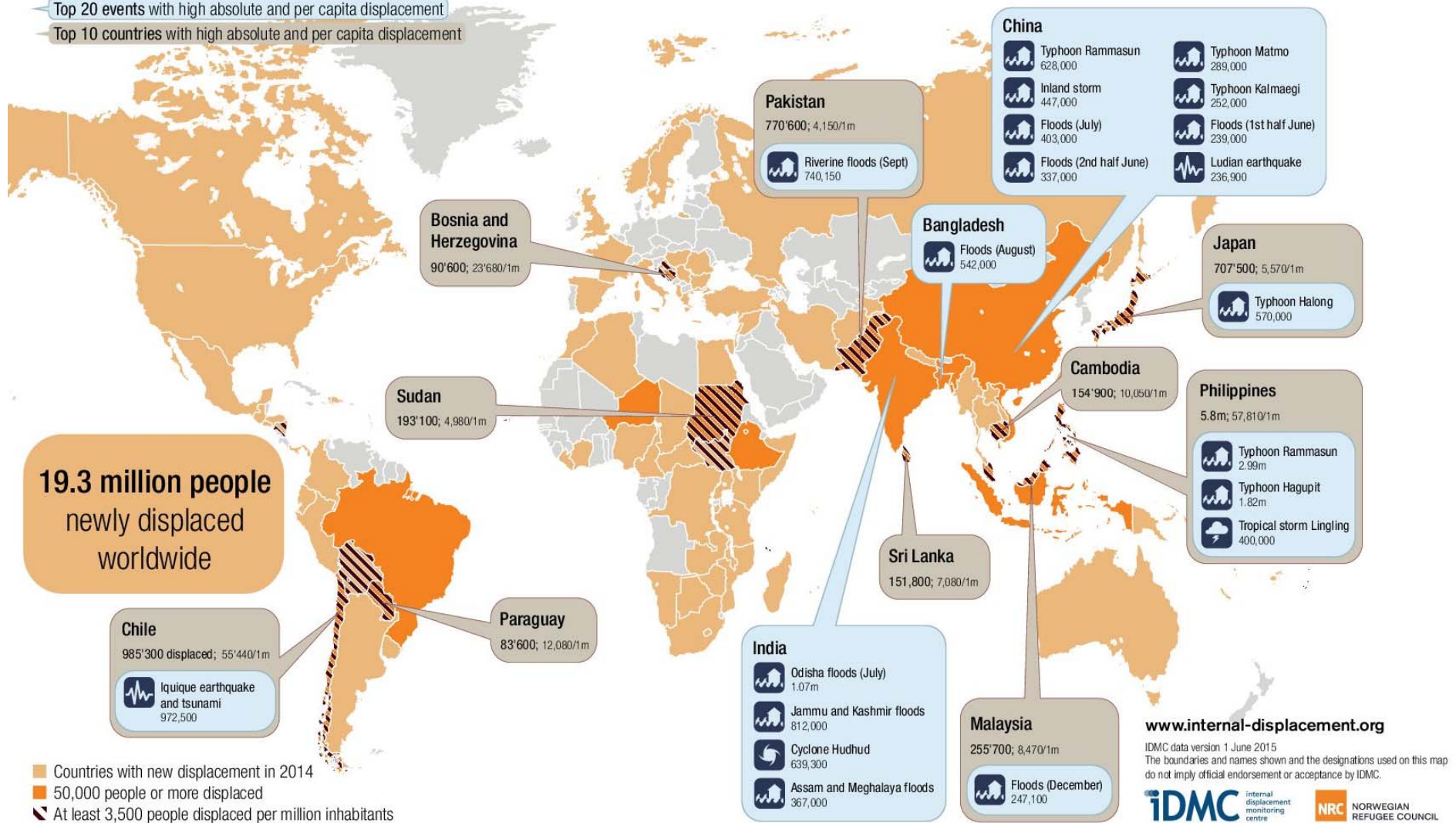
Conclusion

- * Initial evidence for positive relationship between scarcity, competition for these resources and spite (controlling for beliefs that others will be spiteful, income, income inequality, etc.)
- * Persistent scarcity as a source of conflict. But: Real life institutions may prevent that experimental “money burning” turns into real conflict

Ongoing work

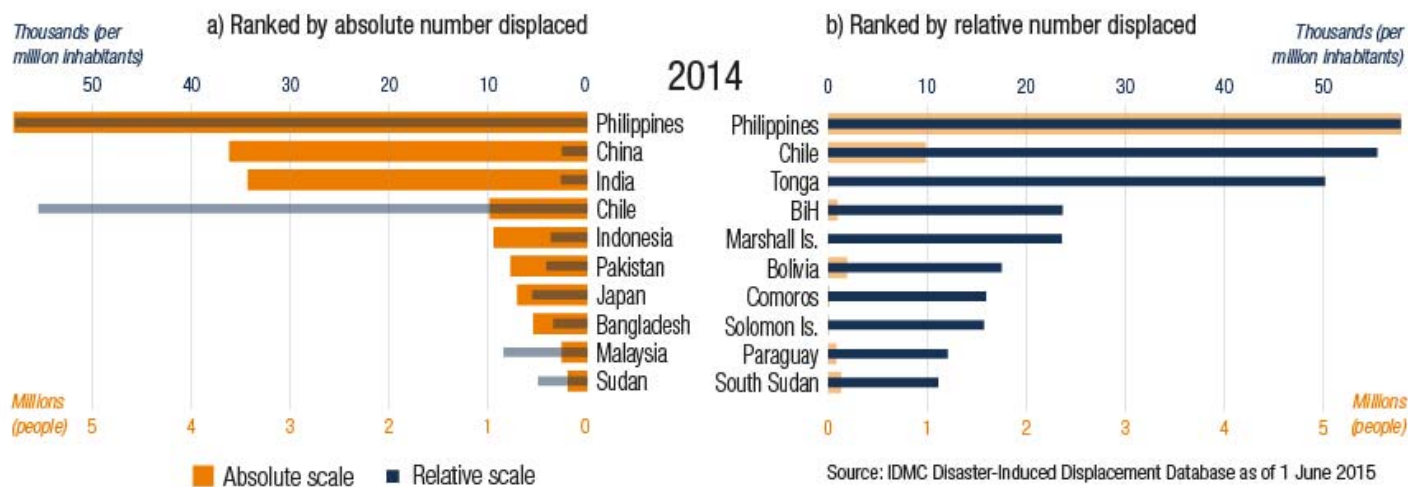
Displacement related to disasters worldwide in 2014

- Top 20 events with high absolute and per capita displacement
- Top 10 countries with high absolute and per capita displacement



Shadow of the past: How do past (climate) events change behavior?

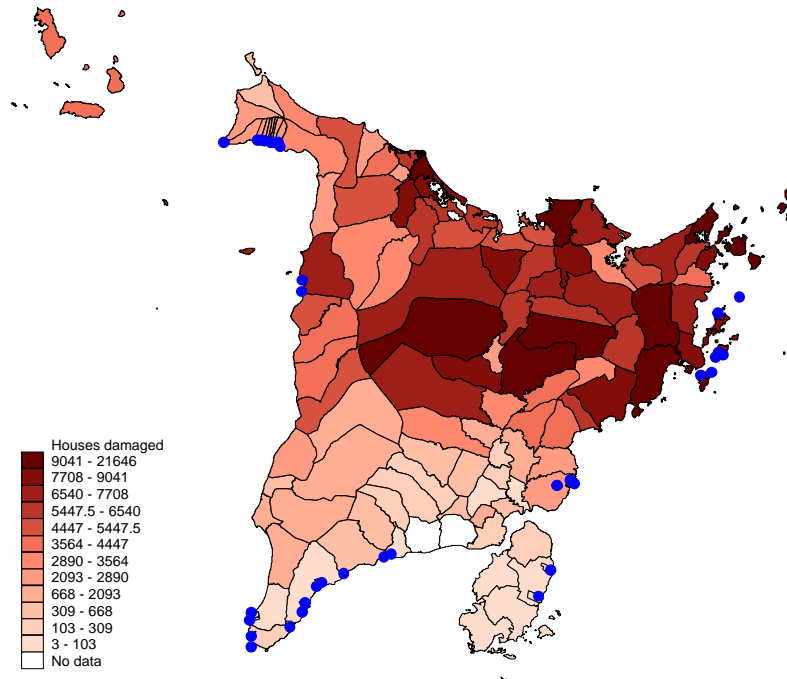
Countries with the highest level of disaster displacement



Shadow of the past: Philippines



Typhoon Haiyan (Yolanda), crossed the Philippines on 7 and 8 November 2013.



The shadow of the future and the shadow of the past

- * Region VI (Western Visayas):
 - * Total affected population 2,8 Mio (out of 8 Mio)
 - * Damaged houses 496,303 (242,957 totally damaged).
- * Baseline experiment (800 Filipinos in 2012 in Region VI) in 30 villages. We do:
 - * Build panel data on short and medium term effects on coping with catastrophic events
 - * Additional info on availability of financial institutions, emergency aid, village leadership, ...

Shadow of the past: Philippines



'Bayanihan': Community members volunteer to help a family move to a new place. Bayanihan has been adopted as a term to refer to local civil effort to resolve national issues.

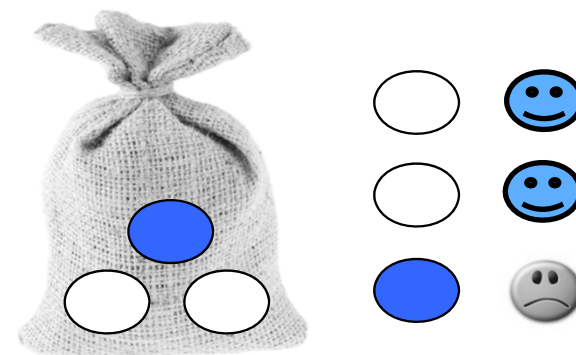
- * We use solidarity behavior as the central outcome:
 - Overwhelming evidence for the importance of risk-sharing, in part driven by pro-social preferences
 - Social preferences important for charitable giving, employment contracts, public goods, common pool resources, etc.

Shadow of the past: Philippines

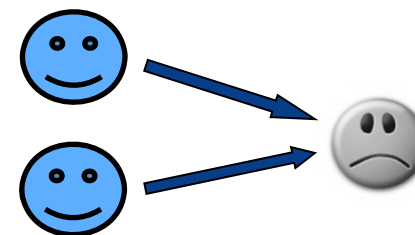
- * Hypothesis: Catastrophic events alter the fundamental ways in which people behave. Solidarity today depends on past coping success (feeling of being left alone vs being part of a functioning group).
- * Experimental studies on negative life changing events (without baseline data) have produced mixed evidence:
 - * Natural disasters
 - * more trust (Cassar et al. 2012)
 - * no trust effect (Andrabi and Das 2010)
 - * less trustworthy (Fleming et al. 2011)

Shadow of the past: Philippines

- * Groups of three participants
- * All have 200 PhP initial endowment, one group member faces a loss

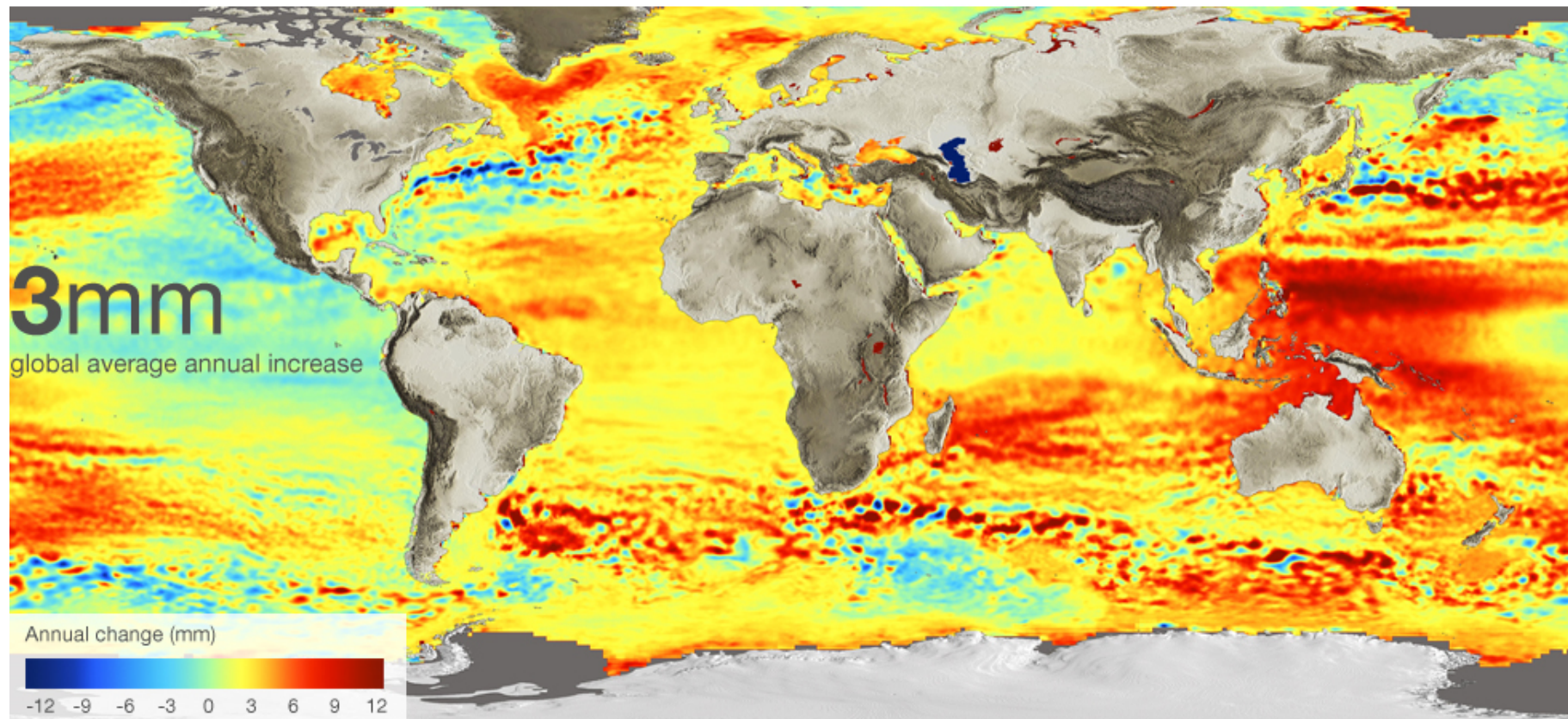


- * Winners can compensate the loser
- * Transfer $\in \{0,10,20,30,40,50,60,70\}$



Shadow of the future – (How) does a likely future event affect behavior today?

Annual average sea-level rise, 1993-2010





Maldives

- Given mid-level scenarios for global warming emissions, the Maldives is projected to lose some 77 percent of its land area by around the year 2100.
- If sea level were instead to rise by 1 metre, the Maldives could be almost completely inundated by about 2085



The shadow of the future and the shadow of the past

Dr. Björn Vollan

Shadow of the future: Solomon Islands



- * Ontong Java Atoll (2000 people).
- * Taro Atoll (1000 people)
 - * Taro Island decided to build an entirely new town on a higher and larger nearby island, to which the population will be moved in stages.
 - * Relocation project is the first time that a provincial capital with all its services and facilities will be relocated in the Pacific Islands.

Shadow of the future: Solomon Islands

Table 3: Perceived impacts of flooding. Results of household survey.

Islands		Impact from flooding		
		Yes, major	Yes, minor	No
Bellona	Total (47)*	2	1	44
	%	4.3	2.1	93.6
Ontong Java	Total (63)	24	29	10
	%	38.1	46.0	15.9
Tikopia	Total (46)	14	4	28
	%	30.4	8.7	60.9

“There is no sea-level rise; it is high tides caused by the wind (...) erosion is a problem, but a problem caused by ourselves. We cut trees; we take sand from the beach to the village”

“Three men came to the island last year and talked about this climate change and the sea rising. One of these men said that the island will go down in ten years or something like that. Most of us are not interested in moving to any other place ... at least not if we can’t go back. I would rather stay; even if the island starts to sink ... then I will sink with the island.” (Chief in Matema)

Rassmussen et al. (2009) “Climate change on three Polynesian outliers in the Solomon Islands: Impacts, vulnerability and adaptation” *Danish Journal of Geography* 109(1), 1–13.


Birk and Rassmussen (2014) “Migration from atolls as climate change adaptation: Current practices, barriers and options in Solomon Islands” *Natural Resources Forum* 38, 1–13.

Shadow of the future: Solomon Islands



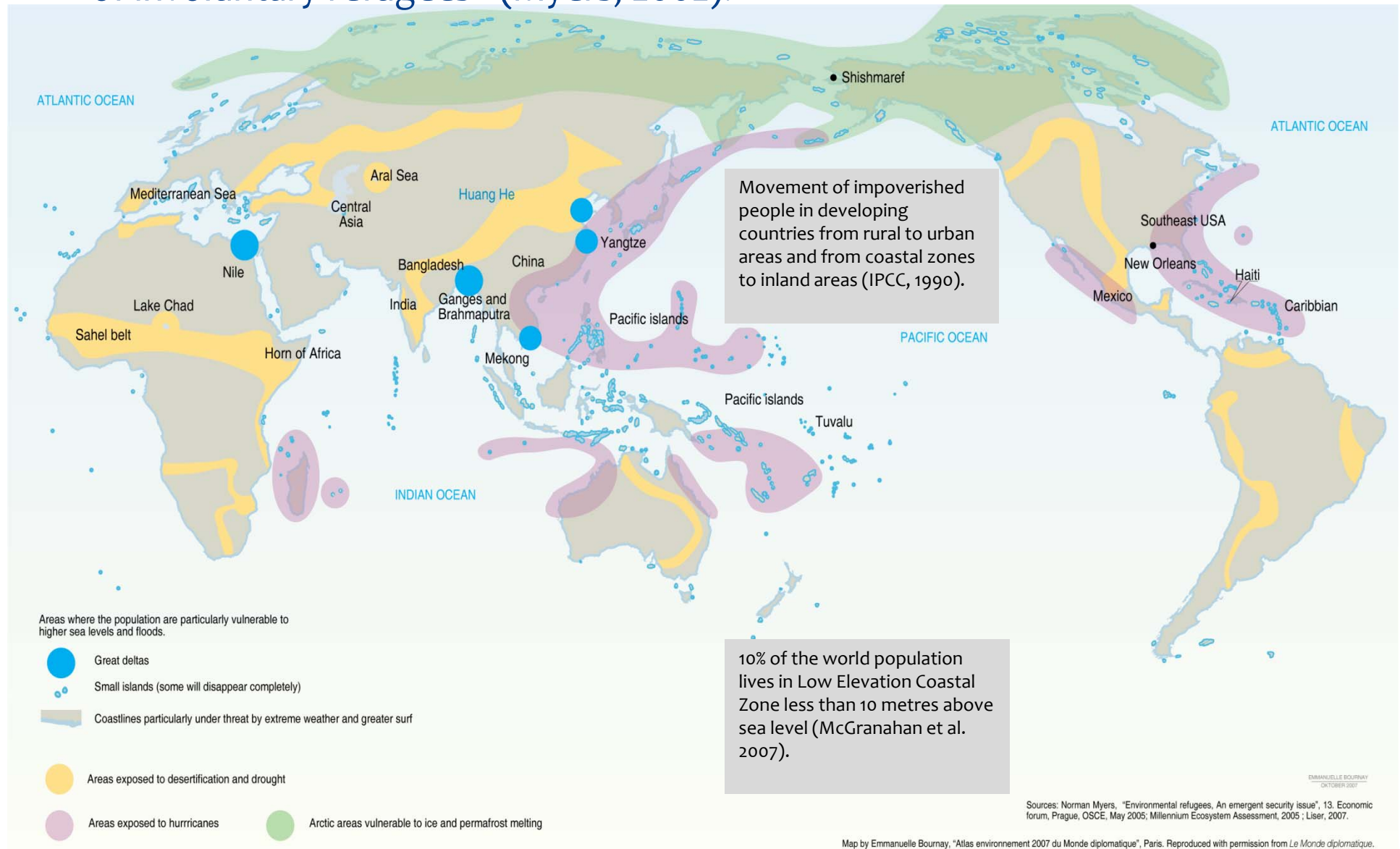
The shadow of the future and the shadow of the past

- * We sample inhabitants living on atolls, migrants from atolls and unaffected islanders.
- * We compare how risk perception, time and social preferences change with exposure to actual and perceived sea level rise.
- * Additionally use of psychological priming techniques on “learning about risk”
- * Link with network analyses and hypothetical questions on migration and data on investments, etc.

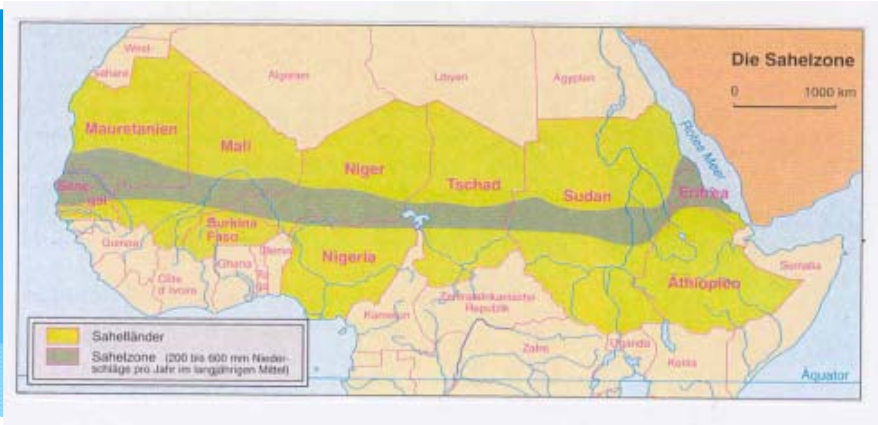
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- * Findings from the case studies on future climate migrants on the atolls may also apply to other areas in the world – yet they may have more adaptation strategies available.
 - * Understanding the underlying responses of people to past and future climate events is crucial to prevent resource degradation, poverty and to avoid emergency mass movements and conflict.

Climate change and migration: Narratives matter.

Norman Myers (1997) roughly (over)estimated that there will be 200 million environmental migrants in 2050 and later confirmed these figures, adding that “environmental refugees will soon become the largest group of involuntary refugees” (Myers, 2002).



Survey experiment



- * Mbaya is a 26 year old fishermen from the Chad. He is married and has 2 children going to school. Besides that, he is well-educated and has a degree in Business Sciences. However, due to the difficult situation in the job-market he is not able to find an adequate job in his country. Therefore, he continues to be a fisher like his father used to be. Like most citizens in the Chad, Mbaya is a practising muslim. The Chad is located in the Sahel-Belt in Africa. The population figures are steadily increasing which leads to an increased need of food...
- * Story continues with one of the following four scenarios

On a scale from 1 to 8 (8=highest acceptance level), would you rather accept or refuse the migrant coming to Austria legally?

Treatment „ECO“

- * Migrates due to mainly **economical** reasons and seeking for better opportunities in Austria

Treatment „POL“

- * Migrates due to **political instability** in the region (consequences of civil war, ongoing coup attempts, suicide bombings)

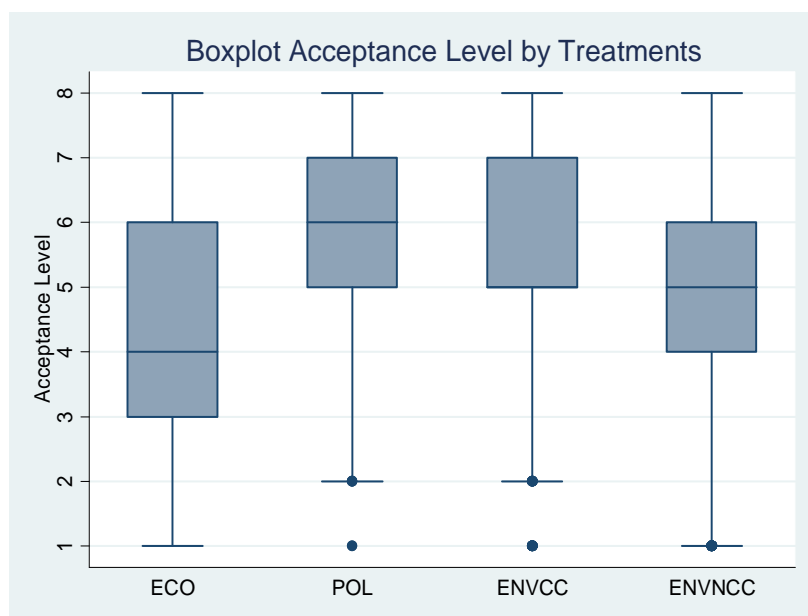
Treatment „ENVCC“

- * Migrates due to **climate change** (Lake Chad is in danger of disappearing because of increasing drought in the region)

Treatment „ENVNCC“

- * Migrates due to the change of environment, mainly for **self-inflicted** reasons such as overfishing

Results (n=686)



4.64

5.52

5.53

4.86

Treatments	t	P> t
POL vs ECO	3.72	0.000
ENVCC vs ECO	4.36	0.000
ENVNCC vs ECO	1.08	0.282
ENVNCC vs POL	-.322	0.001
ENVNCC vs ENVCC	-4.04	0.000

In reality multiple reasons for migration. Depends on the narrative that is constructed by politicians, media, ... how likely we are to accomodate migration.

Thank you for your attention!

