Session 1: Climate change and disasters
Discussant Comments

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UN Expert Group Meeting: Gathering Storms and Silver Linings

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Climate migration is taking place against a backdrop of…

- Major demographic shifts and continued rapid population growth in many of the world's least developed regions
- Population pressures and land degradation in subsistence productive systems (e.g., land fragmentation in Africa)
- Breakdown of institutions and rising conflicts (e.g., Horn of Africa and now the Sahel and even Central America)
- The rise of nationalist politics and increasingly unreceptive countries in the global North
- Global efforts to achieve a very ambitious development agenda – the 2030 Agenda

Against this backdrop, the questions of the hour, are:

- Has the climate change signal, as a driver of human mobility, risen above the noise?
- What will happen in the future?
- Corollary: How do we design scientifically robust research and modeling methods that can answer these questions?

THE IMPACT OF CLIMATE CHANGE ON THE SPATIAL DISTRIBUTION OF POPULATIONS AND MIGRATION

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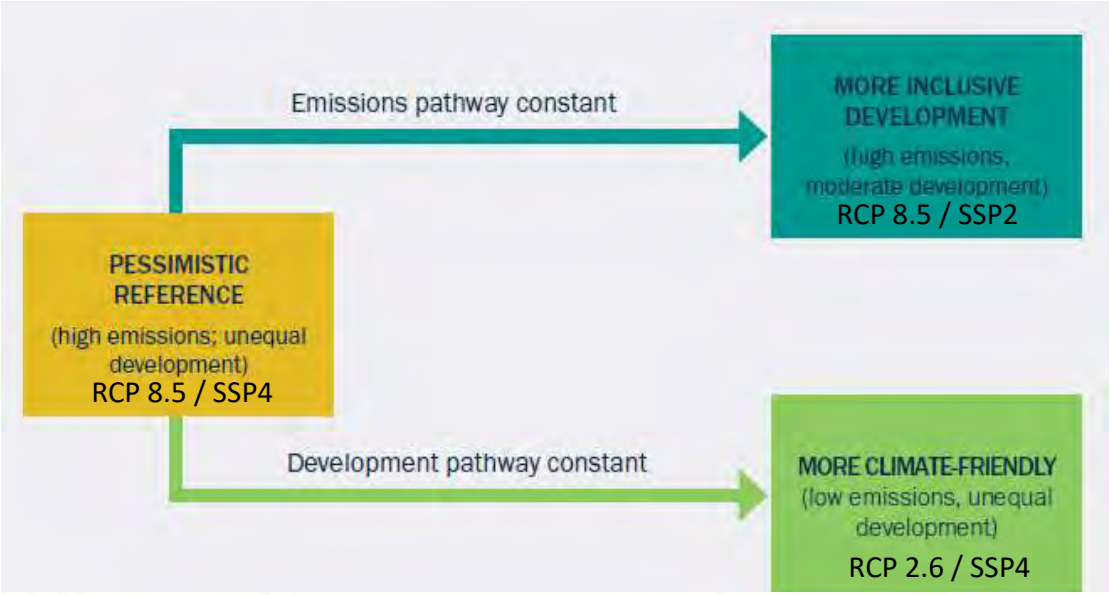
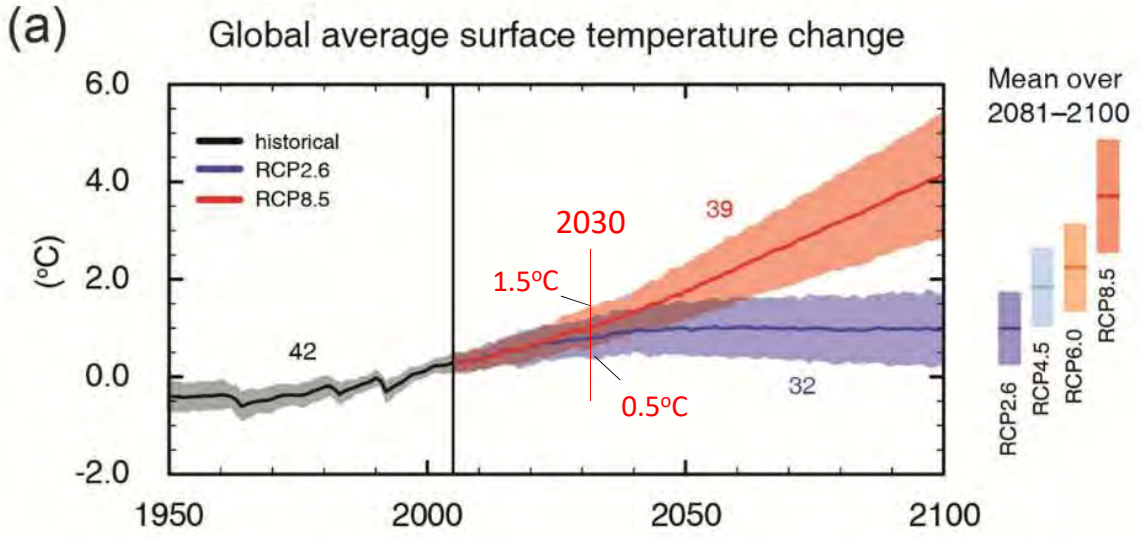
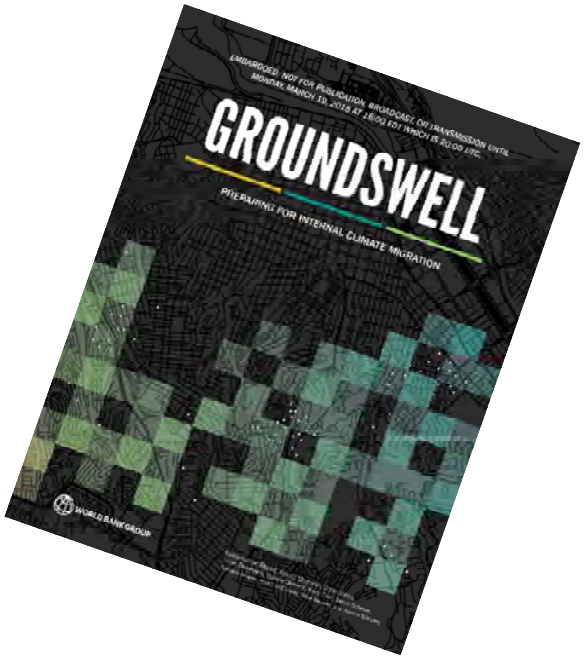
We wrote, "The classic way of projecting population, with its assumptions of progressive changes in fertility, mortality and migration, does not incorporate any type of **environmental feedbacks or constraints**, nor any consideration of abrupt changes in the underlying conditions. This is a known issue. For example, **Cohen (1998) has proposed the incorporation of limiting factors into population projections and estimates**, particularly in long-term projections. Depending on the scope, scale and purpose of the projection, these external factors may include **government migration policies, regional water shortages, or locally limited agriculture potential**… Given the information presented in previous sections about the likely impact of climate change events on population distribution and migration, this is an option to be considered in the near future, though the **uncertainties and specific feedbacks are difficult to fully anticipate**." (submitted in 2008)

UN DESA 2011


Emissions pathway constant
MORE INCLUSIVE DEVELOPMENT
(high emissions, moderate development)
RCP 8.5 / SSP2
PESSIMISTIC REFERENCE
(high emissions; unequal development)
RCP 8.5 / SSP4
Development pathway constant
MORE CLIMATE-FRIENDLY
(low emissions, unequal development)
RCP 2.6 / SSP4


(a)
Global average surface temperature change
6.0
4.0
2.0
0.0
-2.0
(°C)
historical
RCP2.6
RCP8.5
2030
1.5°C
0.5°C
42
39
32
1950
2000
2050
2100
Mean over 2081–2100
RCP2.6
RCP4.5
RCP6.0
RCP8.5


GROUNDSWELL
PREPARING FOR INTERNAL CLIMATE MIGRATION

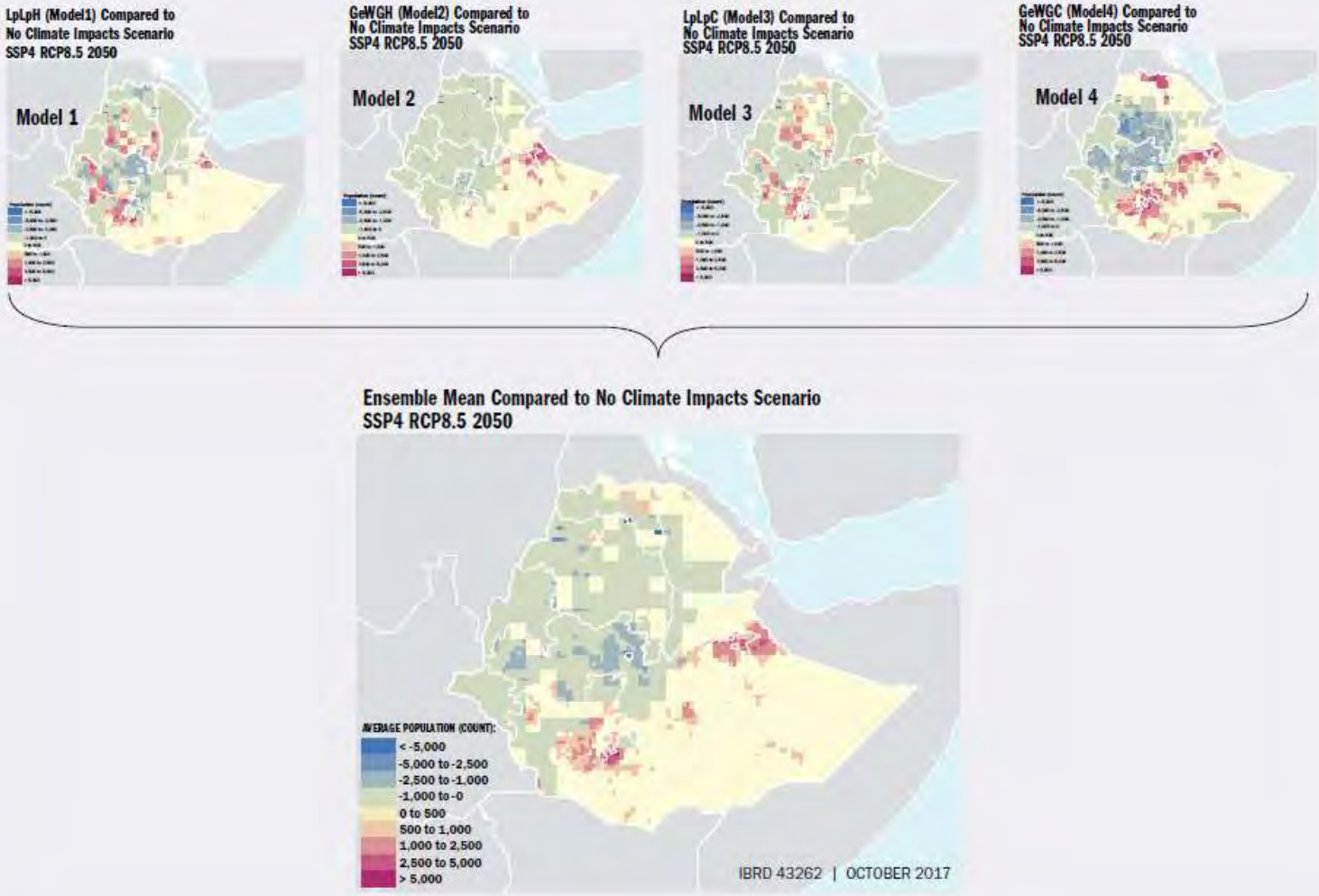
A B

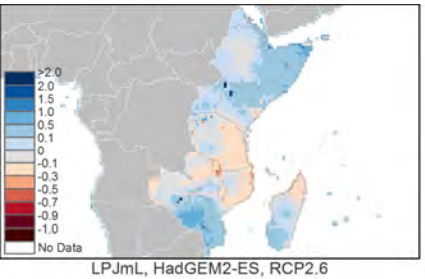
Table A.1: Spatial population projection scenarios

Climate impacts scenarios (combining ISIMIP sectoral impacts by RCP with SSPs)	No climate impacts (SSP-only) population projections used for comparison
Pessimistic reference (RCP8.5/SSP4): Population is projected based on ISIMIP sectoral impacts model outputs for RCP8.5 and on development trajectories found in SSP4	SSP4: Population is projected based on development trajectories found in SSP4
More inclusive development (RCP8.5/SSP2): Population is projected based on ISIMIP sectoral impacts model outputs for RCP8.5 and on development trajectories found in SSP2	SSP2: Population is projected based on development trajectories found in SSP2
More climate-friendly (RCP2.6/SSP4): Population is projected based on ISIMIP sectoral impacts model outputs for RCP2.6 and on development trajectories found in SSP4	SSP4: Population is projected based on development trajectories found in SSP4

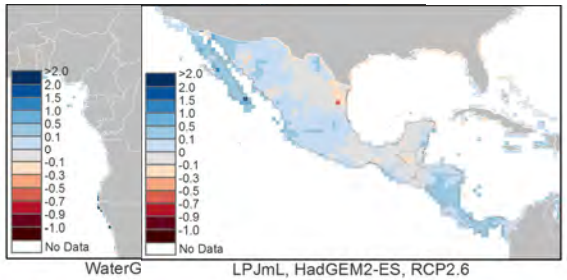
Climate migration = A *minus* B (sum of all positive grid cells in a country)

Figure 3.3: Illustrative example for Ethiopia: Combining four model outputs into one ensemble

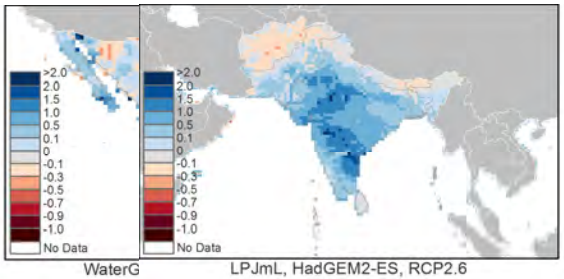




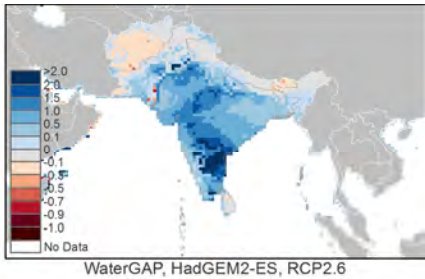
LPJmL, HadGEM2-ES, RCP2.6



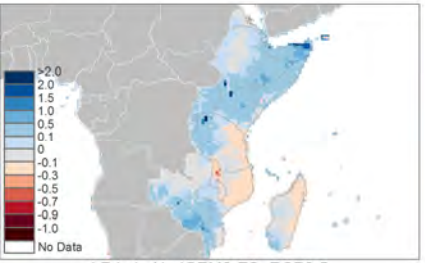
WaterG LPJmL, HadGEM2-ES, RCP2.6



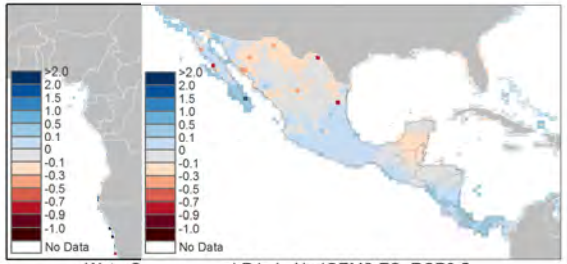
WaterG LPJmL, HadGEM2-ES, RCP2.6



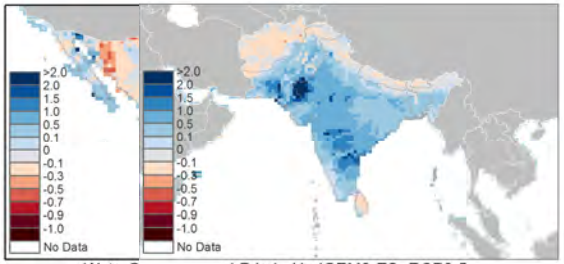
WaterGAP, HadGEM2-ES, RCP2.6



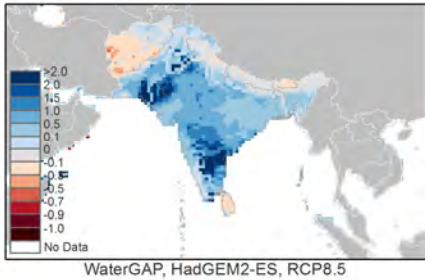
LPJmL, HadGEM2-ES, RCP8.5



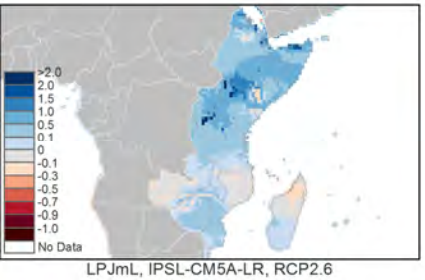
WaterG LPJmL, HadGEM2-ES, RCP8.5



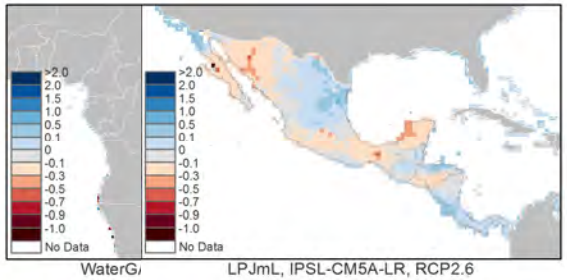
WaterG LPJmL, HadGEM2-ES, RCP8.5



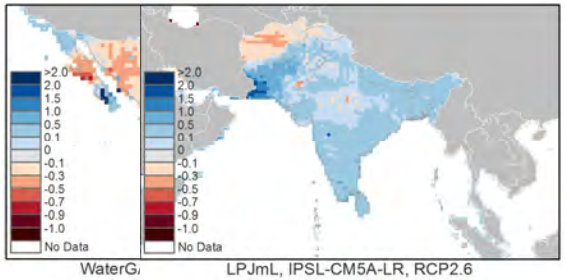
WaterGAP, HadGEM2-ES, RCP8.5



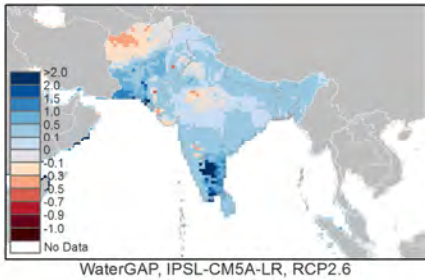
LPJmL, IPSL-CM5A-LR, RCP2.6



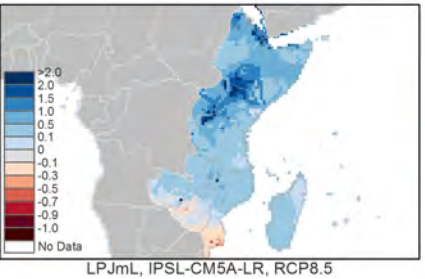
WaterG/ LPJmL, IPSL-CM5A-LR, RCP2.6



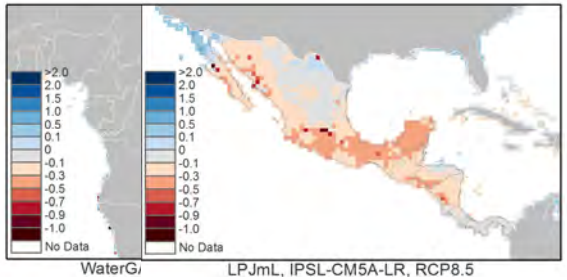
WaterG/ LPJmL, IPSL-CM5A-LR, RCP2.6



WaterGAP, IPSL-CM5A-LR, RCP2.6



LPJmL, IPSL-CM5A-LR, RCP8.5



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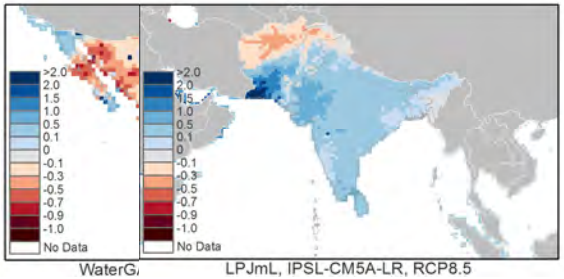
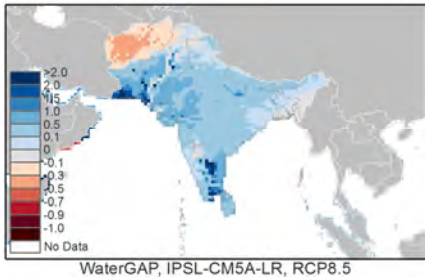
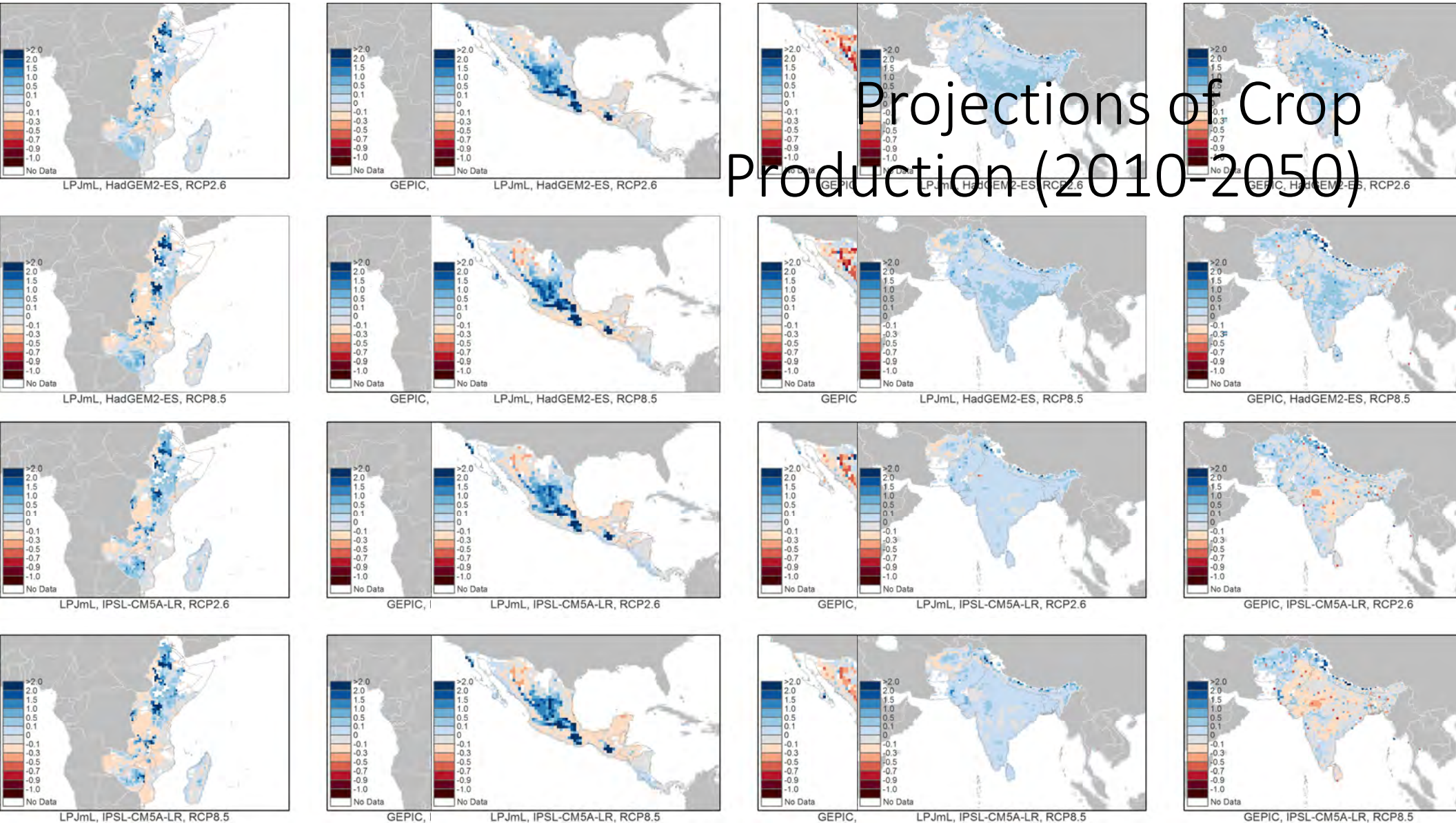


WaterG/ LPJmL, IPSL-CM5A-LR, RCP8.5



WaterGAP, IPSL-CM5A-LR, RCP8.5

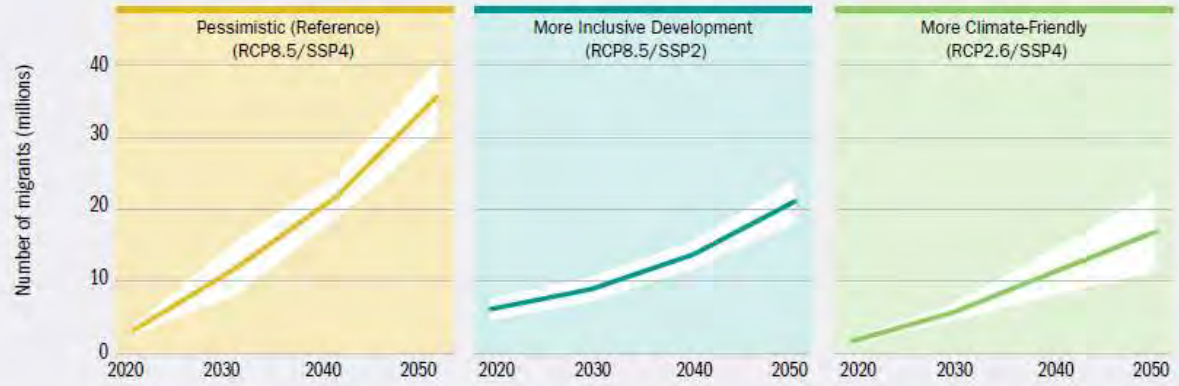
Projections of Crop Production (2010-2050)



Headline numbers

- Up to 140 million internal migrants by 2050 in the three regions
- The largest numbers are in Africa, suggesting high climate sensitivity in that region
- Numbers are highest under the Pessimistic scenario, followed by More Inclusive Development and Climate-friendly RCP2.6 scenarios

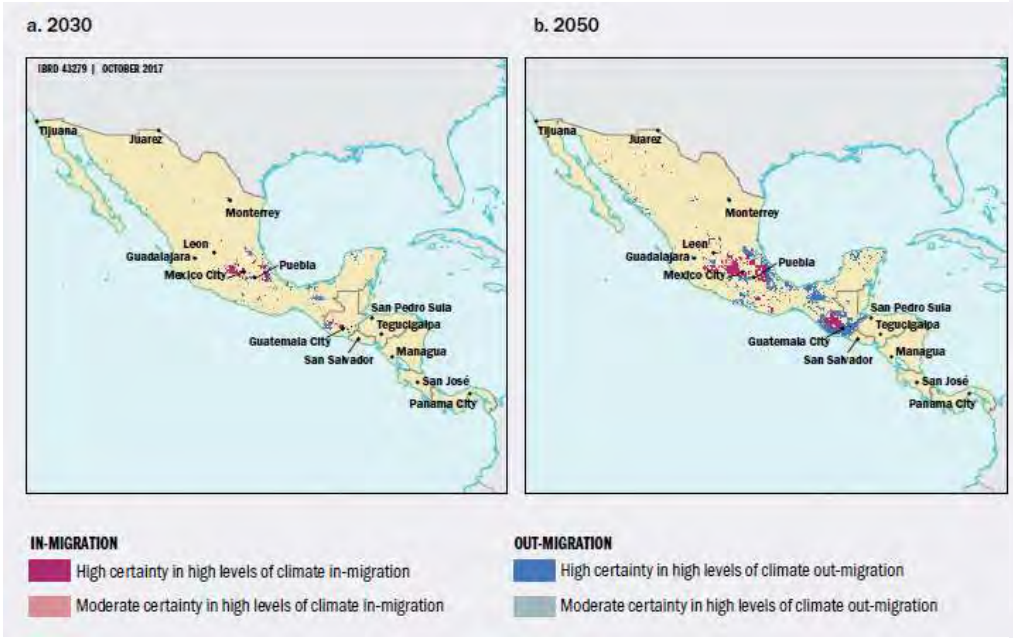
Figure 4.13: Projected number of internal climate migrants in South Asia under three scenarios, 2020–50

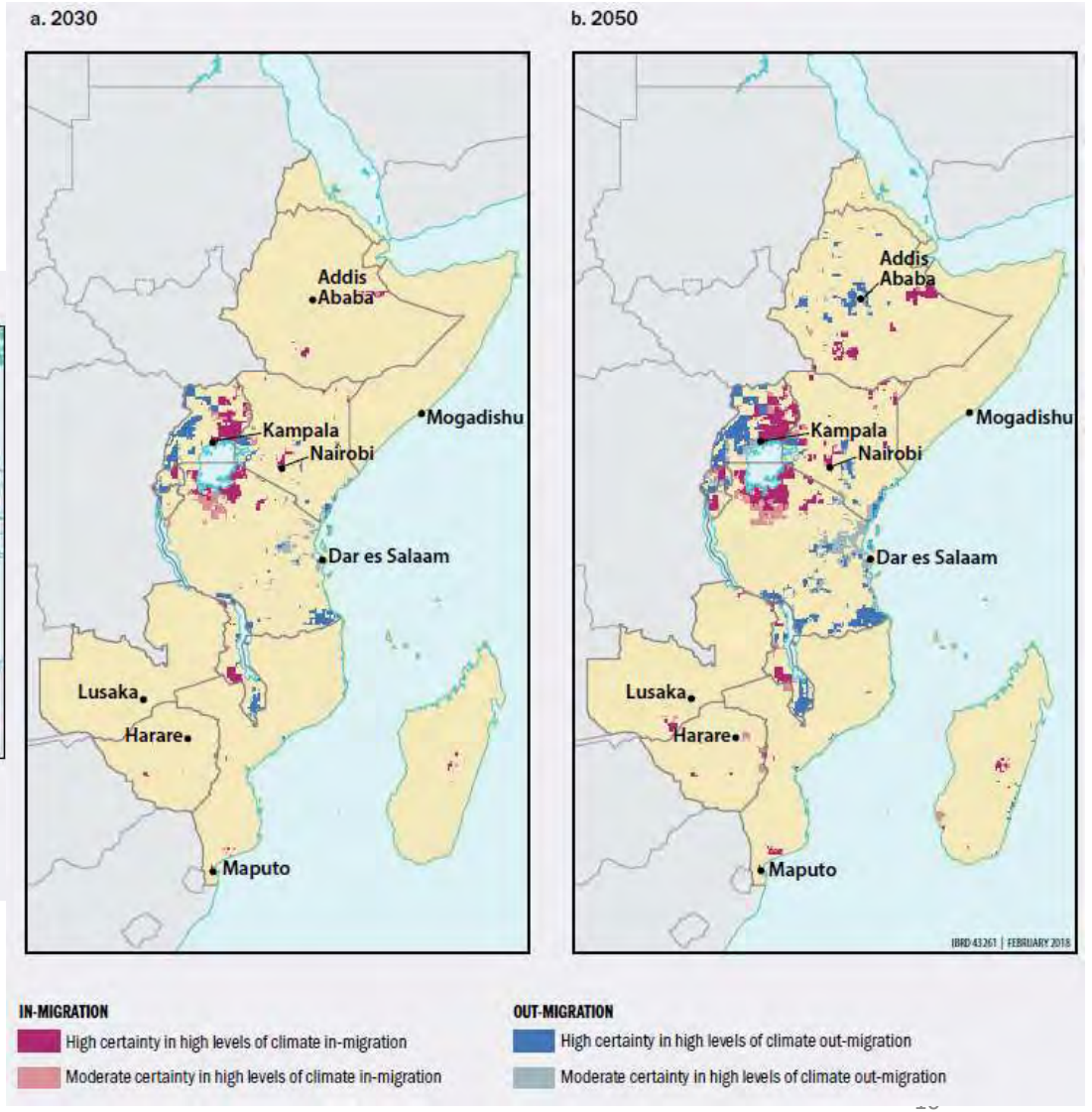


Climate migrants as a percentage of the total population

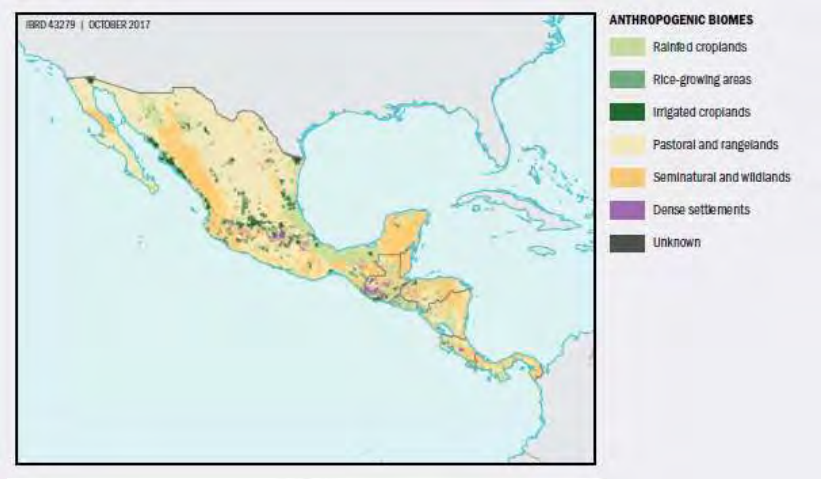
Year	2020	2030	2040	2050	2020	2030	2040	2050	2020	2030	2040	2050
%	0.17	0.58	0.99	1.56	0.33	0.43	0.61	0.89	0.09	0.28	0.52	0.74

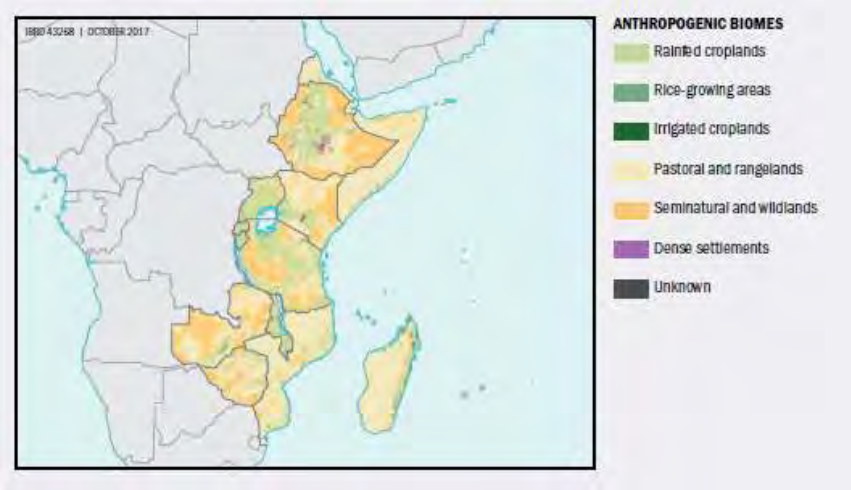
Spatial patterns

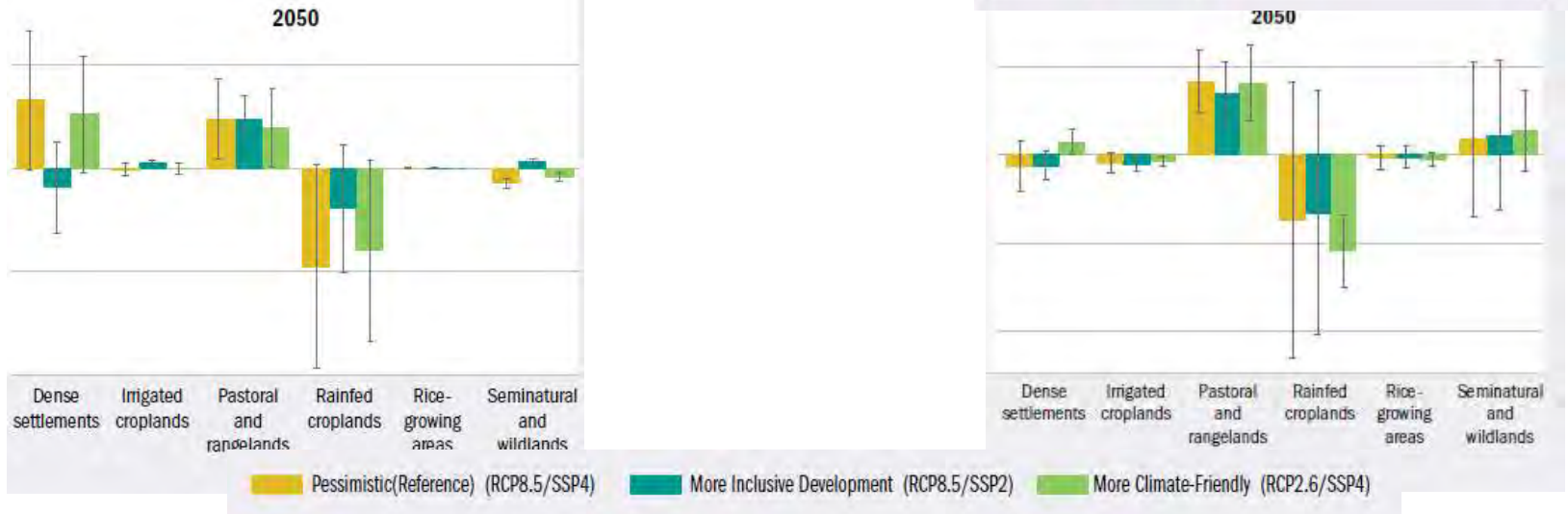




Livelihood Systems

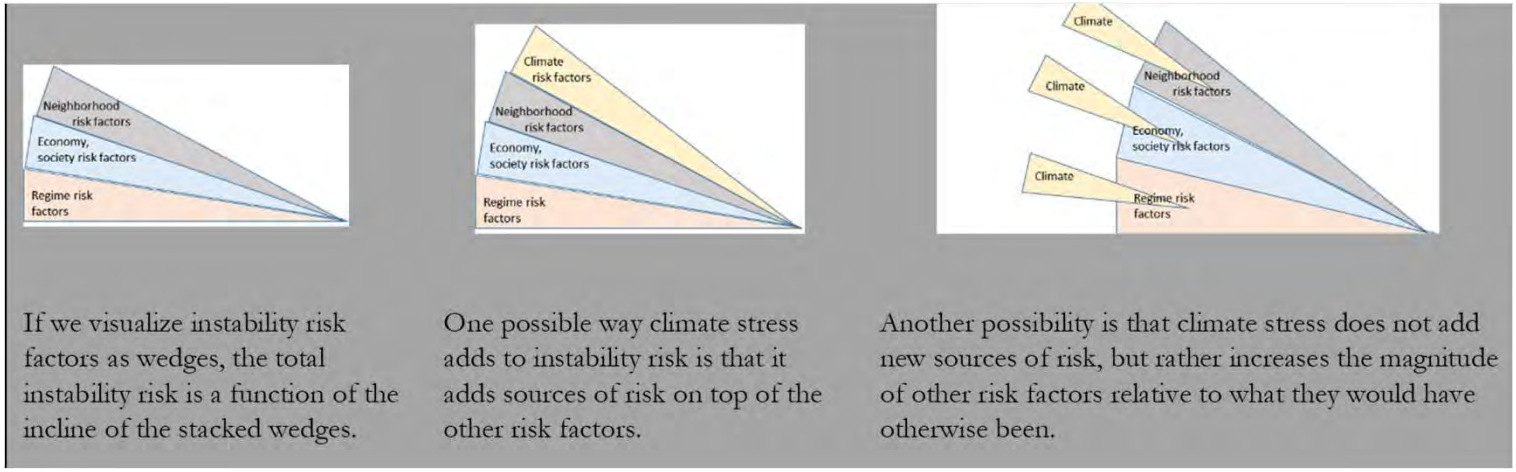






Groundswell projections are likely a lower bound

- No one can precisely project climate-induced migration… and yet..
- We did not adequately account for extremes
- We did not take into account the “threat multiplier” of climate as it relates to conflict or breakdown of societal order



If we visualize instability risk factors as wedges, the total instability risk is a function of the incline of the stacked wedges.

One possible way climate stress adds to instability risk is that it adds sources of risk on top of the other risk factors.

Another possibility is that climate stress does not add new sources of risk, but rather increases the magnitude of other risk factors relative to what they would have otherwise been.

SDGs likely to be impacted by even a 1.5°C rise

- Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- Goal 6. Ensure availability and sustainable management of water and sanitation for all
- Goal 10. Reduce inequality within and among countries
- Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
- Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Thank you!

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