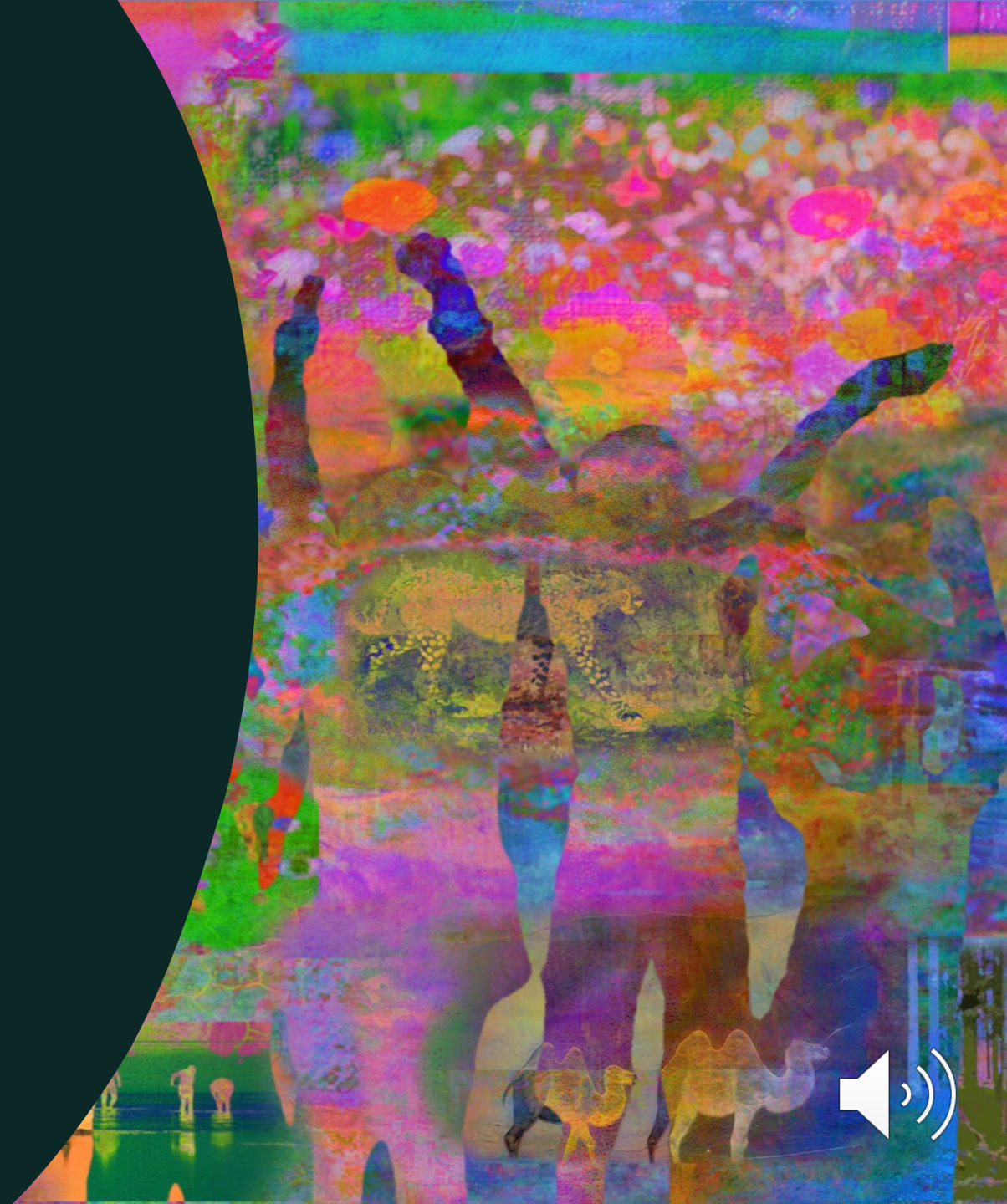


# The Future of Climate Modelling - A Working Group II Perspective

*Impacts, Adaptation and  
Vulnerability*

*Chris Lennard, Ch9, Africa*



Climate Change 2022

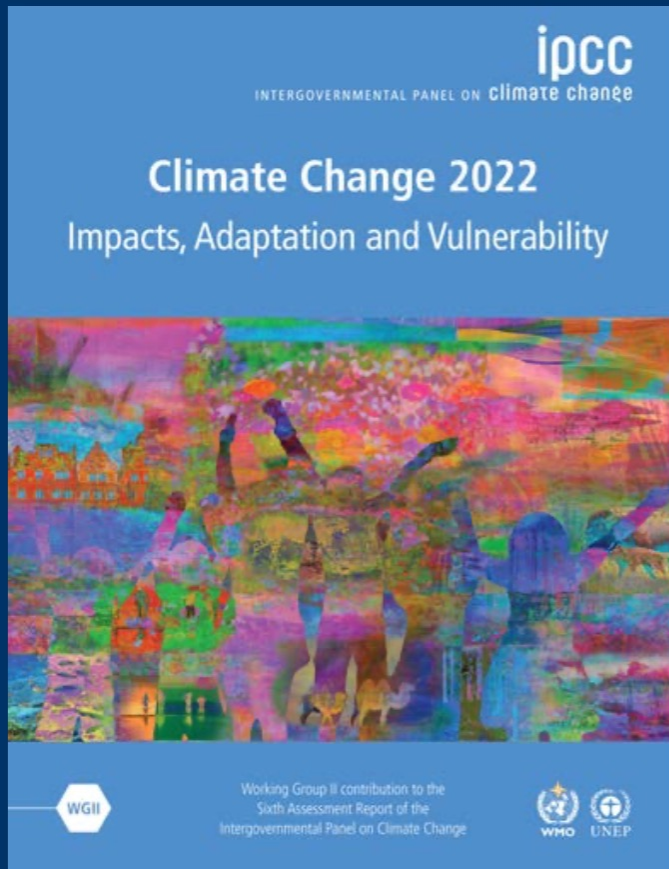
# Impacts, Adaptation and Vulnerability

Co-Chairs of IPCC Working Group II



[Ocean Image Bank/Matt Curnock, S. Baldwin, both CC BY-NC-ND 2.0; Yuichi Hishida/UNDP Timor-Leste CC BY-NC 2.0]





The scientific evidence is unequivocal: climate change is a threat to human well-being and the health of the planet.

Any further delay in concerted global action will miss the brief, rapidly closing window to secure a liveable future.

This report offers solutions to the world.



Global warming  
has caused dangerous and  
widespread disruption in nature

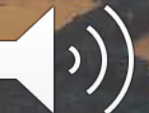


...and climate change is affecting the lives of billions of people, despite efforts to adapt.



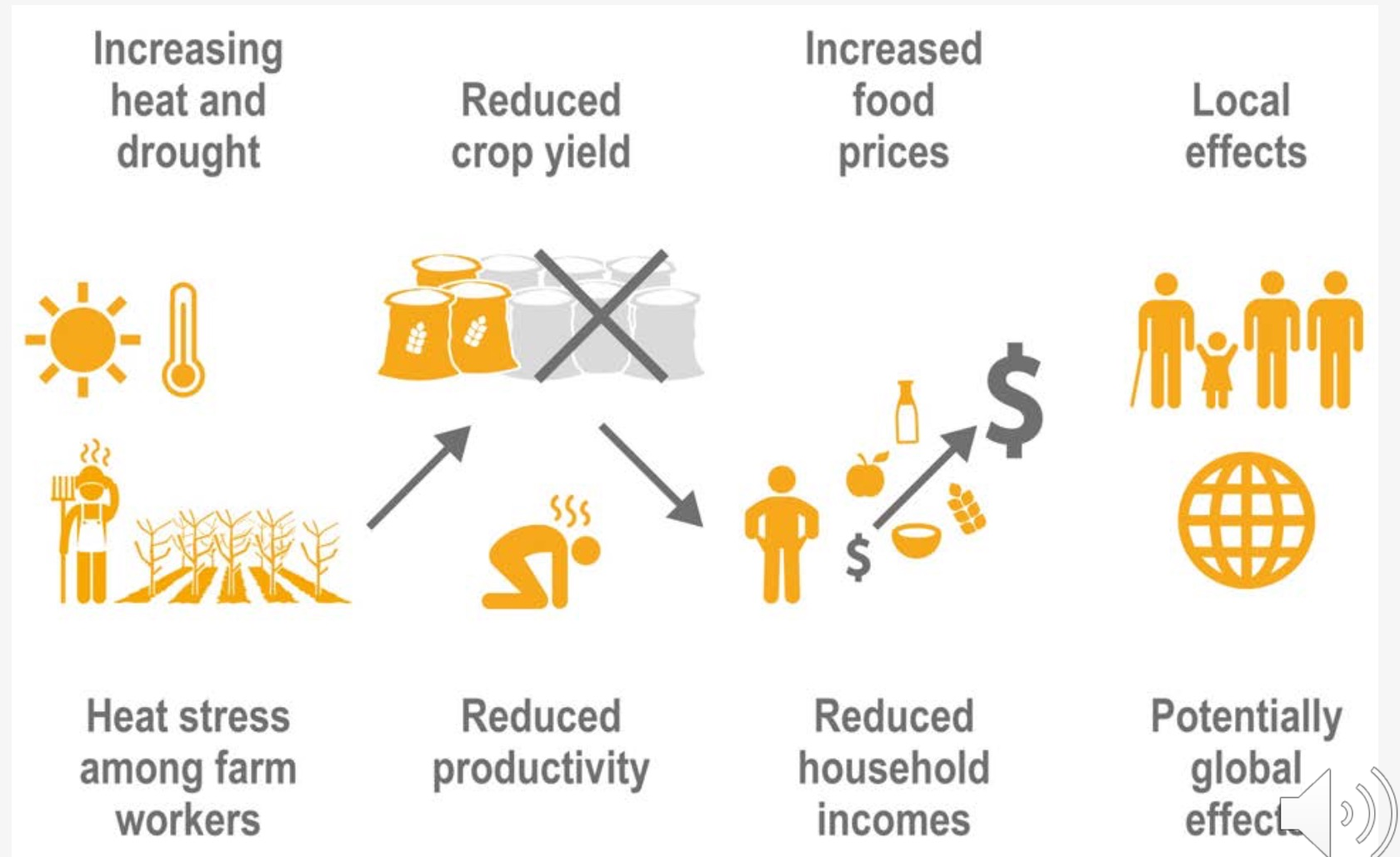
Impacts are magnified in cities where more than half the world's population lives.

Large urban scale modelling

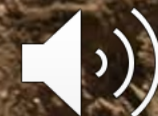


# Simultaneous extreme events compound risks

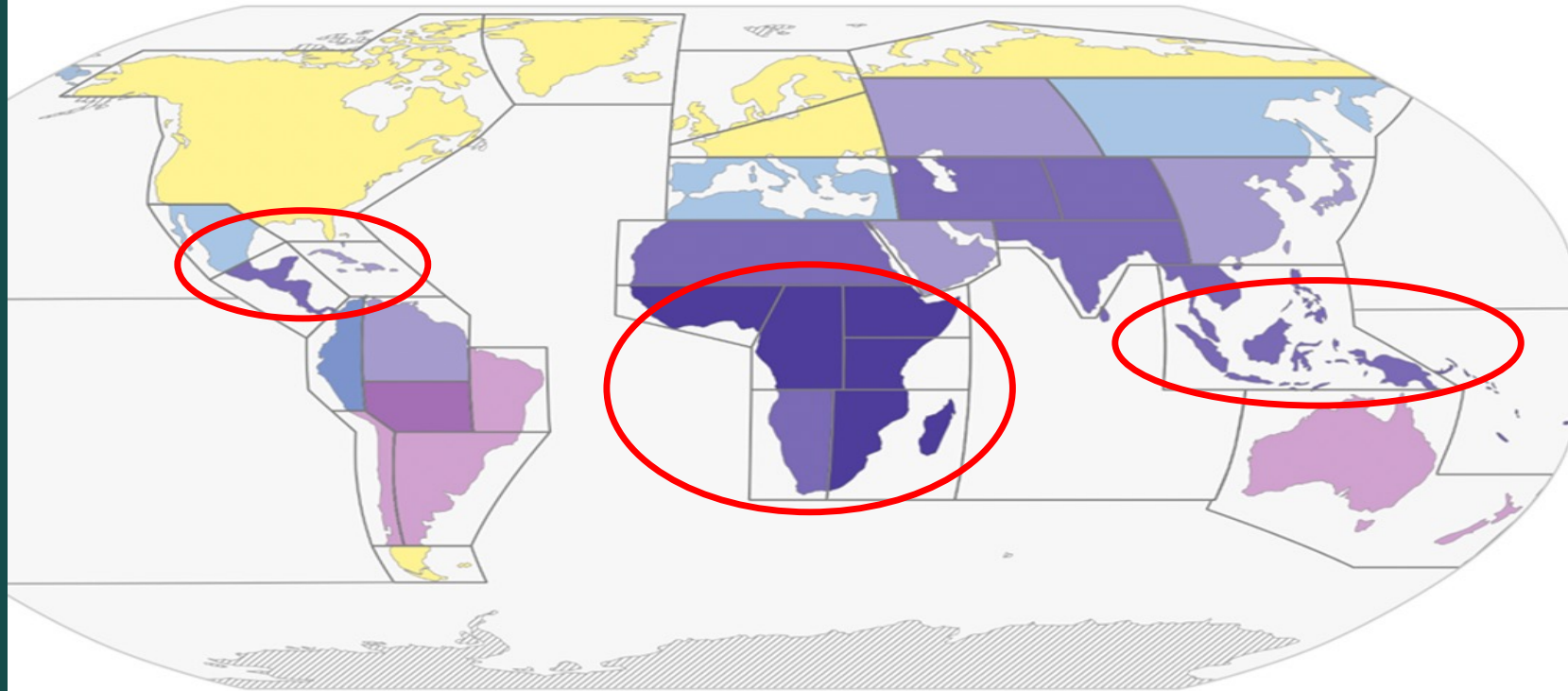
Multiple extreme events that compound the risks are more difficult to manage



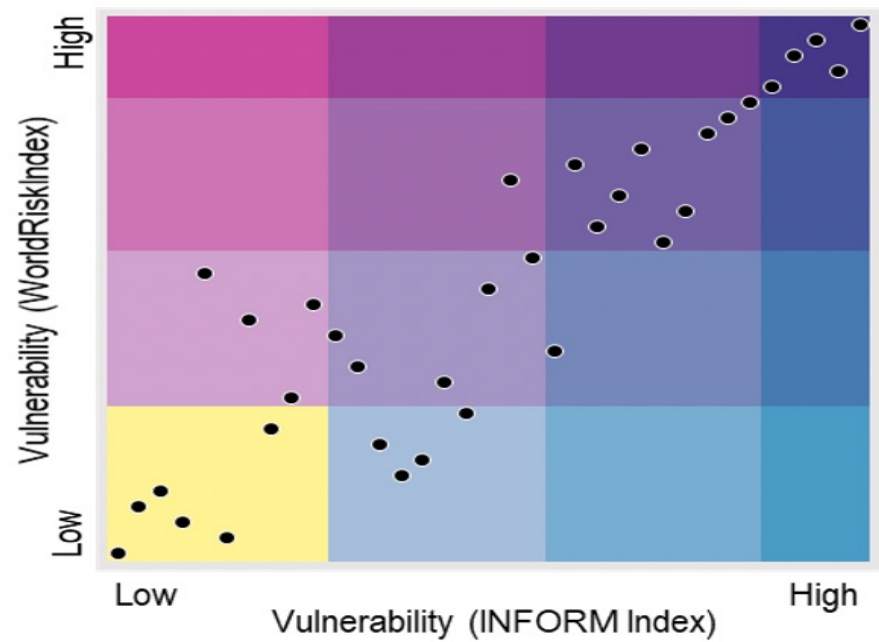
3.3 – 3.6 billion people live in hotspots of high vulnerability to climate change.







**Understanding  
tropical and  
subtropics**





To avoid mounting losses, urgent action is required to adapt to climate change.

At the same time, it is essential to make rapid, deep cuts in greenhouse gas emissions to keep the maximum number of adaptation options open.

## Climate Change Adaptation (WGII)

*The goals of climate change adaptation, as a broad concept, are*

- *to reduce risk and vulnerability to **climate change**,*
- *strengthen **resilience**,*
- *enhance well-being and*
- *enhance the capacity to **anticipate, and respond successfully to change**.*

**Climate modelling speaks to all of these aspects of adaptation**



## Our future?

- Reduced climate risks – adaptation
- Reduced greenhouse gas emissions – mitigation
- Enhanced biodiversity
- Achieved the Sustainable Development Goals

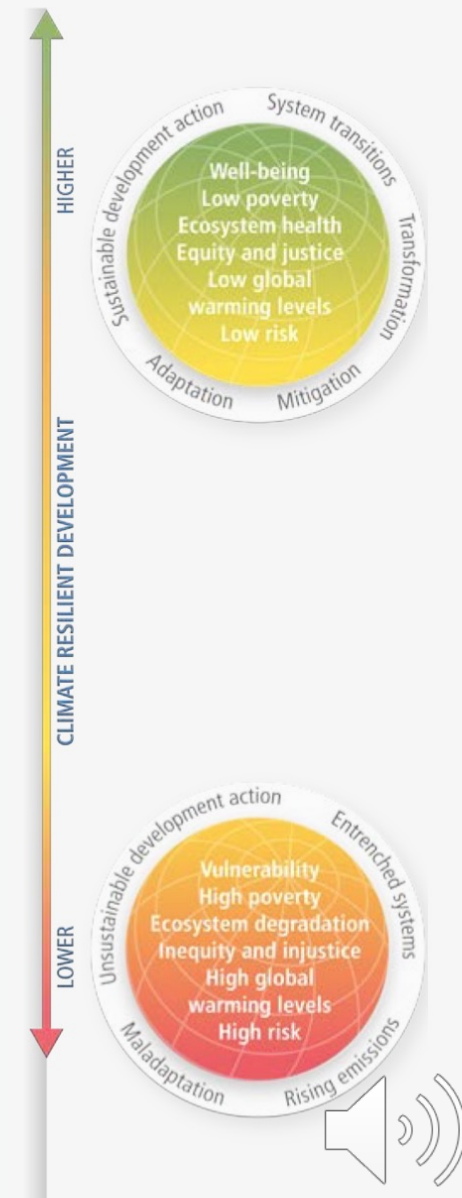
## This is Climate Resilient Development.

*A process of implementing greenhouse gas mitigation and adaptation measures to support sustainable development for all.*



# Climate Resilient Development

- Draws on wide-ranging knowledge (scientific, indigenous, local, practical)
- Conserves and restores ecosystems
- Involves marginalized groups
- Prioritises equity and justice
- Reconciles different interests, values and world views
- Requires scaled-up investment and international cooperation



## How can climate modelling contribute to CRD?

(These are my opinions based on WGII text, but not the official position of the IPCC WGII)

*Challenges and opportunities to CRD w.r.t. climate information (and therefore assumed climate modelling):*

- Early warning systems and climate services (drought, heat, disease, flood)
  - Particularly developing nations and large city contexts
- Uncertainties in climate and socioeconomic projections constrain adaptation planning and implementation
- Uncertainty in future water availability for consumption, food & fibre and energy
- Uncertainty in ocean modelling for fisheries

Modelling at relevant time and space scales

Can the uncertainty space be constrained or understood better



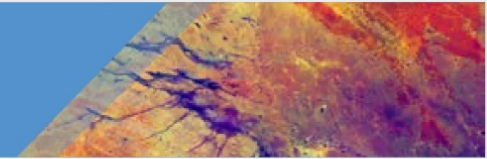
# How can climate modelling contribute to CRD?

(These are my opinions based on WGII text, but not the official position of the IPCC WGII)

- Challenges related to REDD+ implementation and forest use [[LULCC - Elena](#)]
- Climate change disruptions to natural environments can be expected to disrupt livelihood practices, stimulate higher rates of outmigration to urban centers, and in some instances necessitate planned or organized relocations of exposed settlements [[Changes in means and extremes](#)]
- Renewable energy resources can offset some health impacts [[RE modelling](#)]
- Appropriate use of climate information - avoid maladaptation [[User engagement](#)]
- The challenges posed by different levels of global warming to achieving CRD and the magnitude and nature of the adaptation gap (and associated finance needs) that must be addressed to enable climate resilience.

Weaver, C.P., et al 2013. Improving the contribution of climate model information to decision making: the value and demands of robust decision frameworks. *Climate Change*, 4(1), pp.39-60.





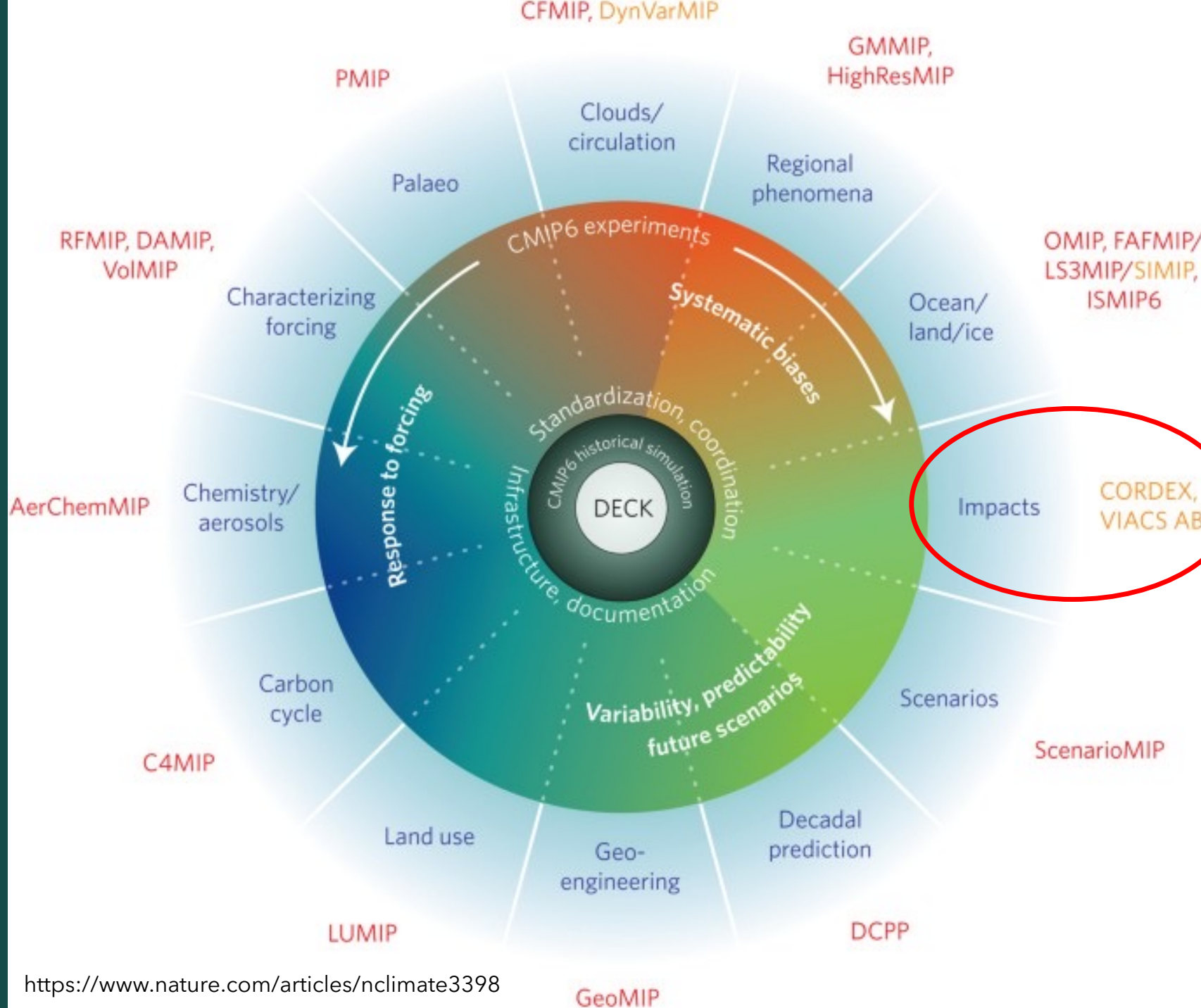
# In summary...how can climate modelling help WGII next time

(Again my opinions, not the official position of the IPCC WGII)

1. Reduce or improve our understanding of the geophysical aspects of model uncertainty
2. Global warming impacts disproportionately around the tails of the distribution, this is where urgent adaptation is needed; can we model the tails better?
3. Contribute to time lines relevant for adaptation (the more difficult time scales...?)
  - S2S, S2D
4. Involve “marginalized” groups (build capacity for modelling)
  - *27 speakers, 3 from developing nations, 2 in this session*
5. Reduce uncertainty around when GWLs may be crossed
6. Give WGII literature time to “catch up” to the CMIP cycle (WGI CMIP6 but WGII largely CMIP5).







For the development of adaptation options relevant to the most vulnerable communities of the Earth we need to contribute more here



# The Future of Climate Modelling - A Working Group II Perspective

*Impacts, Adaptation and  
Vulnerability*

*Chris Lennard, Ch9, Africa*

