Two of the four sets of questions posed for this round table discussion:

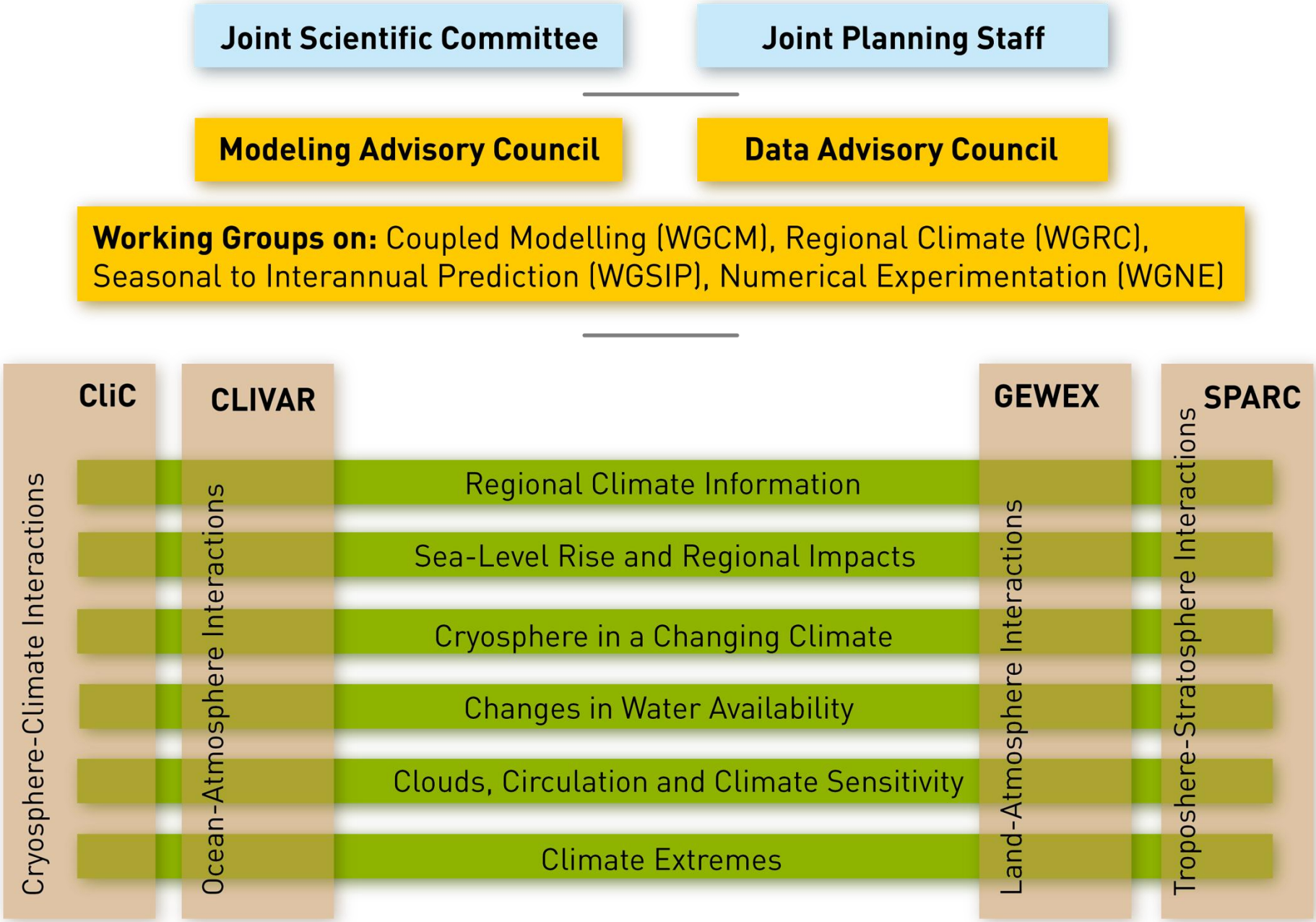
What are the critical climate research outputs needed from the climate research community to inform decision-making, risk management and adaptation planning? Which research frontiers need to be addressed first before delivering on end user requests?

How much do we still not know? What are priority gaps / challenges (both in our scientific knowledge and institutional) that need to be overcome before we can deliver user-requested research outputs and provide operational climate services in support of decision-making?

- *The LAC community is best placed to give specific answers to these questions*
- *But the engagement with users needs to and can start now*
- *WCRP projects and working groups provide a potential framework*
- *But the breadth of the issues and the need for major institutional change mean there is also a need to go beyond the scope of the WCRP*

Clare Goodess (University of East Anglia, UK)
Round table: Climate Services Challenges in LAC

WCRP Organization

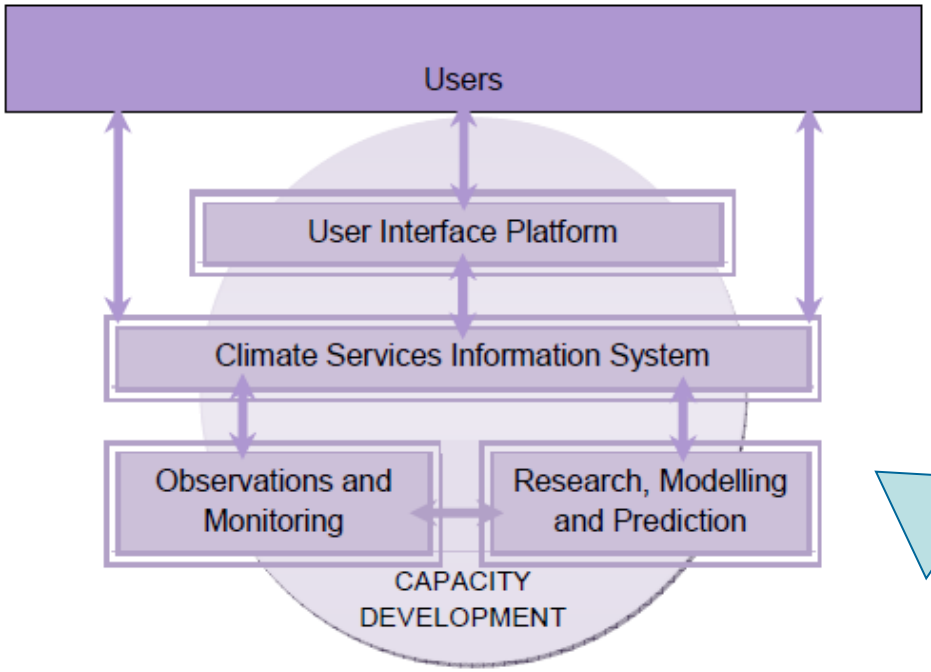


Regional climate information Grand Challenge #1

- Frontier 1: Intraseasonal and seasonal predictability and prediction
- Frontier 2: Decadal variability, predictability and prediction
- Frontier 3: Reliability and value of long-term regional climate change projections
- Frontier 4: Definition of usefulness: informing the risk management and decision making space

WGRC will review outcomes from this meeting and also from the Arusha conference as part of the initiatives associated with this grand challenge

Global Framework for Climate Services (GFCS)



The Impacts, Adaptation and Vulnerability (IAV) community

Domains include South America and Central America & Caribbean

Dynamical and statistical downscaling of climate change projections

WCRP CORDEX

CORDEX 2013 - Key outcomes

1. **Dialogue and co-exploration with end-users**
   - Placing end-users expectations and needs at the heart of th… …opment of the regional climate agenda
   - Tailoring of climate information at relevant spatia… …mporal footprints
   - Need for capacity building and innovative inf… …
2. **Added value of regional climate informa…**
   - Added value at higher order statisti… …ents on regional and local topographic and process level
   - Improve the robustness of… …and demonstrate the regional benefits and systematic skill enhancement of dow… …exercises
   - High-res obs instr… … to the process
3. **Uncertainty**
   - Need to… …robust methods to characterize and communicate ur… end… …nd stakeholders
4. **Fut… …ulation framework**
   - …ore multi-model multi method is needed to capture the necessary u… decision-making and policy challenges

Need for more analysis - focused on regions, processes and applications

THE GEWEX SCIENCE QUESTIONS

1) How can we better understand and predict precipitation variability and changes?

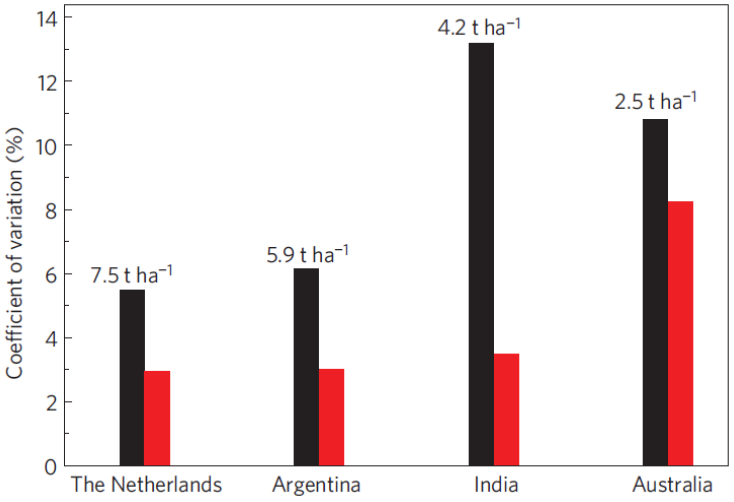
2) How do changes in the land surface and hydrology influence past and future changes in water availability and security?

3) How does a warming world affect climate extremes, and especially droughts, floods and heat waves, and how do land area processes, in particular, contribute?

4) How can understanding of the effects and uncertainties of water and energy exchanges in the current and changing climate be improved and conveyed?

Other international initiatives with which to consider links, e.g: impact model uncertainty and inter-comparison projects

AgMIP The Agricultural Model Intercomparison and Improvement Project



Coefficient of variation in projected wheat yield change due to crop model uncertainty (black – 26 models) and 'downscaled' GCM (red – 16 models). Asseng et al., *Nature Climate Change*, June 2013.

The Inter-Sectoral Impact Model Intercomparison Project

ISI-MIP

Shared socioeconomic pathways (SSPs) provide an opportunity for going beyond the climate scenarios

		SSP 1	SSP 2	SSP 3	SSP4	SSP5
	Reference	X	X	X	X	X
RCP Replication	8.5 Wm^{-2}					
	6.0 Wm^{-2}					
	4.5 Wm^{-2}					
	2.6 Wm^{-2}					

- **For example, SSPs used for agricultural impacts in AgMIP are being termed Representative Agricultural Pathways (RAPs)**

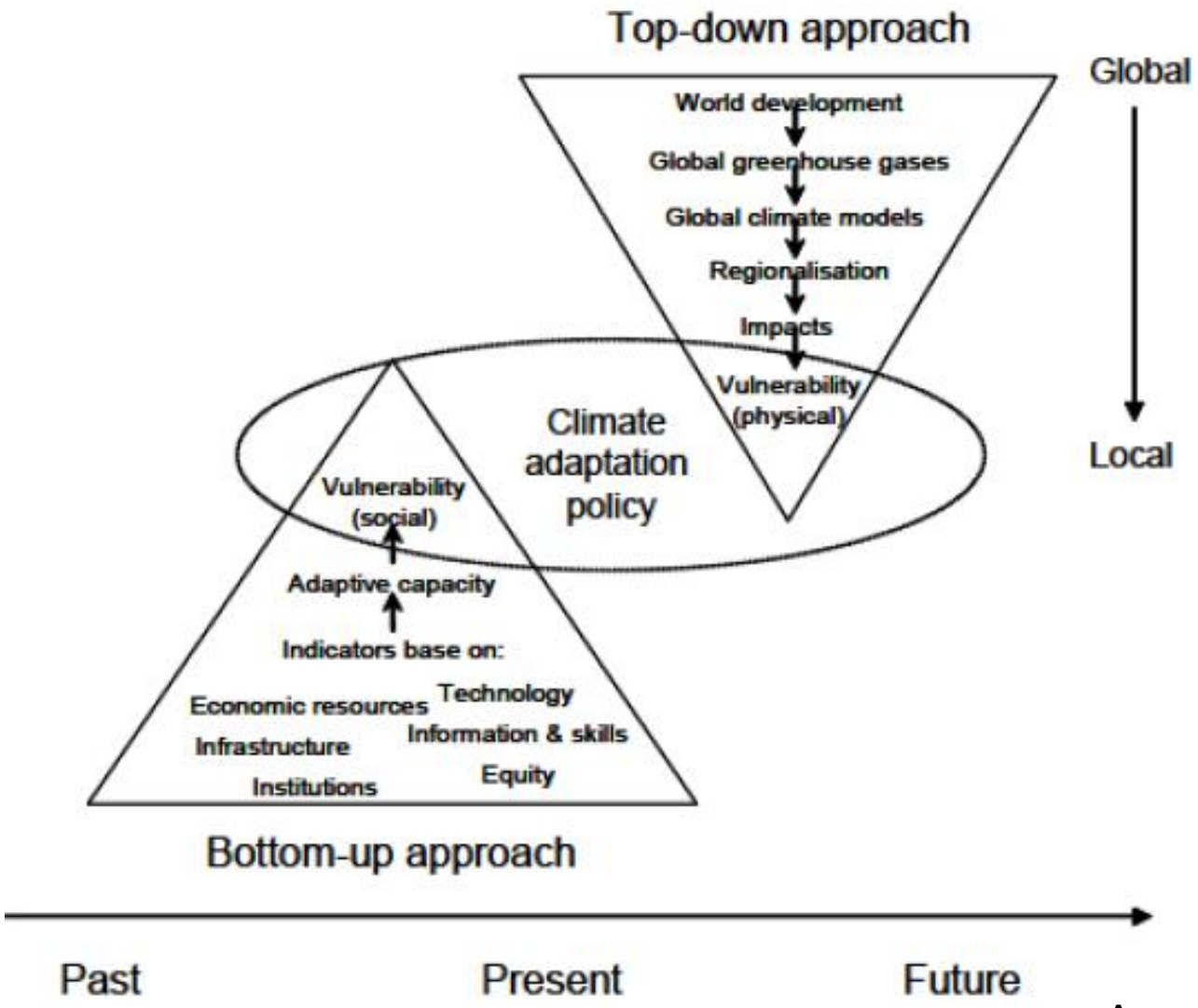
Representative Aricultural Pathways

- economic & social development narratives
- agricultural technology trends
- prices and costs of production
- ag, mitigation & other policy

AgMIP The Agricultural Model Intercomparison and Improvement Project

- **Downscaling is also a research issue for SSPs as for climate**

A new way of thinking?



Approaches to climate adaptation,
Dessai and Hulme, 2004

- Have enough data/information/knowledge to start the engagement with users now
- It will always be an ongoing process as the science, needs and context evolve

- Good interdisciplinary science is built on good disciplinary science (and data) – and space is needed for “blue skies” research

- Building interdisciplinary research needs lots of time for dialogue and discussion – workshops and conferences are not always optimal for this – what about exchange visits, internships (“walking in others shoes”) etc
- Capacity building (of the climate service providers, intermediaries, users) is essential – particularly for ‘small’ communities (e.g., E. Caribbean drought managers – poster by Antonio Joyette & Leonard Nurse)

- In the context of climate services, need to be clear in distinguishing between seasonal forecasts, decadal predictions and climate change projections (and between weather and climate services)

- GFCS implementation – has a key role for NHMSs, RCCs and RCOFs – but there are still vital roles for universities, research institutes, etc