

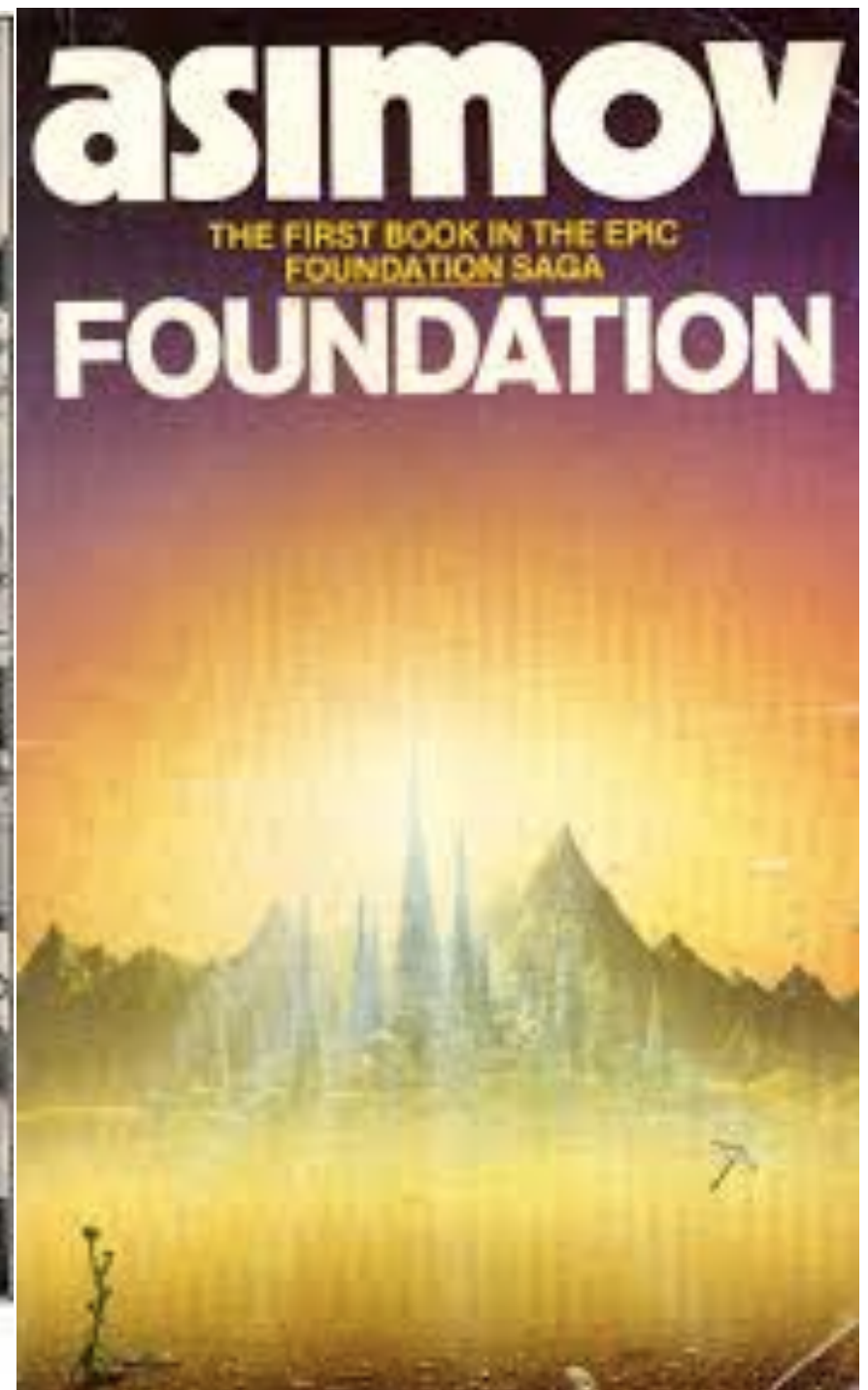
# From how to do it, to getting it done

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GULLIVER IN LILLIPUT.

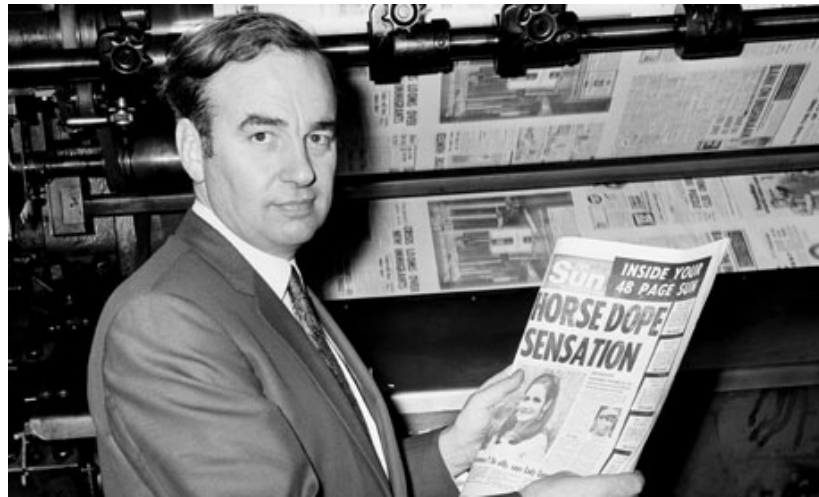






Mandy

# HOW HAS CLIMATE SCIENCE CHANGED MY CAREER?



First article on CC in Uni Newspaper in 1967





Plant growth, regeneration and mortality model – fitted to biomass data

Sheep plant preference model – based on grazing trials

Sheep hunger, thirst and heat balance models – field tested

Needs driven sheep movement behaviour model – tested with field observations

Weather generator – Met & local records

Soil moisture model – field tested

Techniques for analyzing photos to get 50 year biomass traces for 4 forage types

Wool production model – literature

Economics of paddock – land-owner

Effects of changing paddock lay-out, 'super sheep' and climate change. [MSS]

- ANU Research Schools – funding model gave opportunity to focus on theory + practical issues
- Mentor's advice - “Look for a problem that is troubling a large sector of society, and which has a scientific basis – and go there. You will find some very sound and often fundamental scientific challenges and you might do something useful.”
- How do humans affect landscapes?  
Developed from grazing, to succession theory, to fire and forest management (theory and practice) ultimately coming together as the impacts of CC.



Ralph Slatyer



# Fire Ecology SCOPE Project





## Global Change and Terrestrial Ecosystems

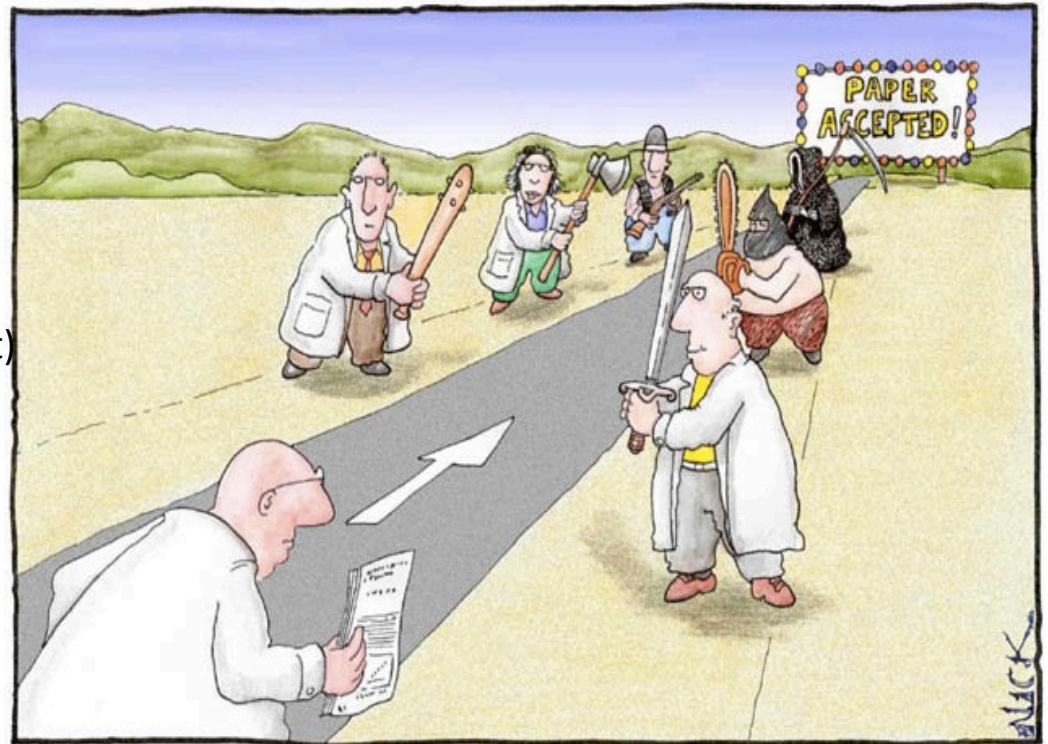
### GCTE Objectives

- To predict the effects of changes on climate, atmospheric composition, and land use on terrestrial ecosystems, including agriculture, forestry and soils, as well as ecological complexity.
- To determine how these effects lead to feedbacks to the atmosphere and the physical climate system.



# Conflict between public good and academic advancement

- Choose the mix you enjoy – and suffer the consequences
- ANU Change in Professional Assessment
- c. 1990
- Three fields –  
choose to be assessed in two or three
  - Research (Publications & Impact)
  - Teaching
  - Public good activities





# Forest carbon sequestration

Sustainable Development Plan for Australian Forests

Royal Commission into the “Future of Australian Forests and Forest Industries”

Media, industry and political briefings

Cooperative Research Centre on forest carbon sequestration (9 agencies, 90 scientists, 7 years)

UNFCCC & IPCC (Co-Chair LULUCF SR)

BioCarbon Fund  
(1 yr secondment to World Bank)

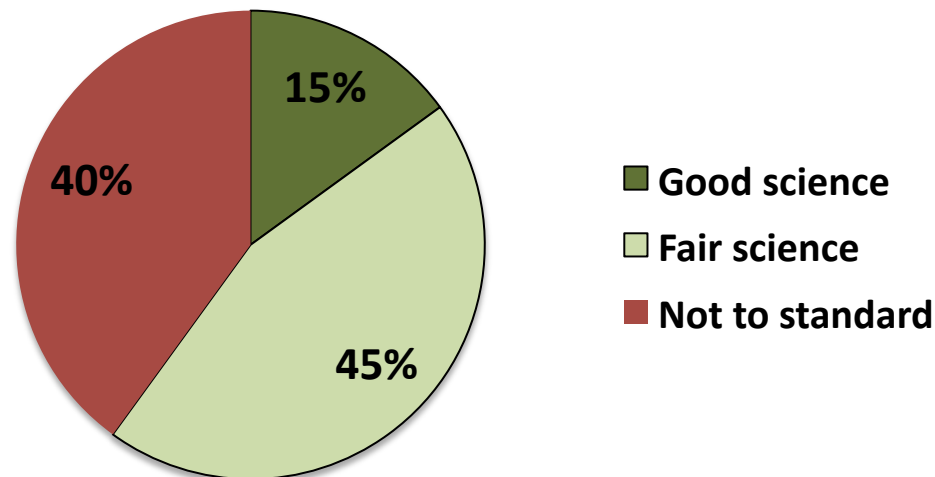


Then why so much focus on mitigation?



## MDBs are significant users - and funders - of 'science'

- In one MDB - Technical Cooperation (read “climate science contracts”) approaching \$100M per year - c. \$1M each



- Some \$100s millions has been spent by various MDBs & UN agencies on capacity building – but with so little result. Capacity dissipates.
- Do we need “Just in time capacity support?”



- “A key characteristic of emerging adaptation science is that it is both **basic**—in that it contributes to understanding fundamental physical, environmental, and socioeconomic research questions—and **applied**, because it is problem focused.”
- “Decision-makers are concerned with cost, feasibility, social acceptance, tradition, and other factors. To close a “usability gap,” scientific information **must fit into existing contexts.**” Hell and High water... Moss et al. 2013 Science
- My World Bank mantra -- Adaptation is (should be) an additional factor in development planning and implementation. It is not the most important issue in development, but it is important.
- Proper use of development funding [*Funding ‘Catch 22’*]
- Approach – not a large adaptation unit, but adaptation in every unit.

# Estimating the 'cost of adaptation'

**Table 3.** World Bank Preliminary estimate of the costs of additional impacts of climate change and adaptation in developing countries

Item	Amount per year	Estimated portion climate sensitive	Estimated costs of adaptation	Total per year (US\$ 2000)
ODA and Concessional Finance	\$100 bn	40%	10 – 20%	\$4 – 8 bn
Foreign Direct Investment	\$160 bn	10%	10 – 20%	\$2 – 3 bn
Gross Domestic Investment	\$1500 bn	2 – 10%	10 – 20%	\$3 – 30 bn
<b>Total Adaptation for International finance flows</b>				<b>\$6 – 11 bn</b>
<b>Total Adaptation for all development finance flows</b>				<b>\$9 – 41 bn</b>

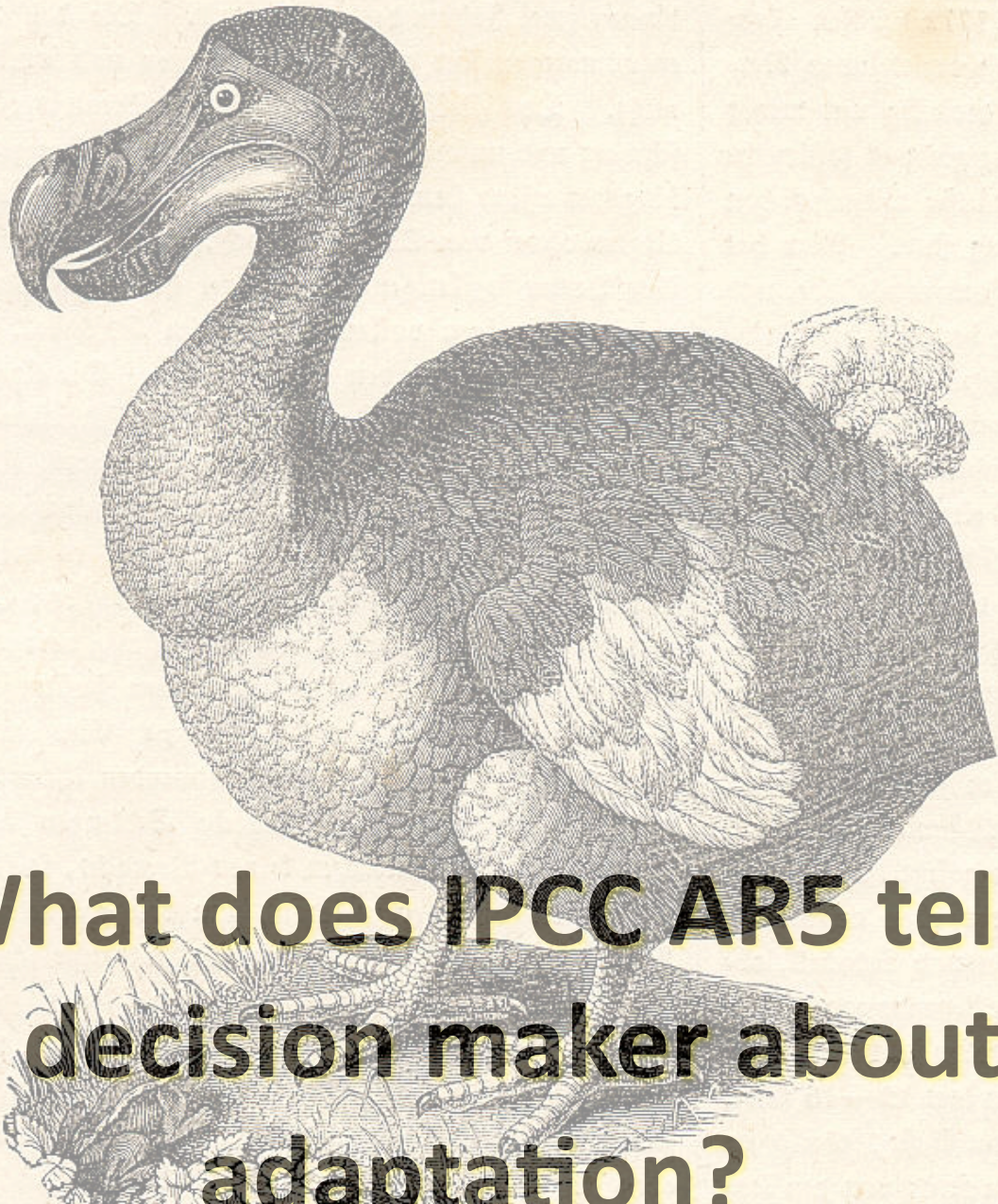
Source: World Bank Energy and Investment Framework (2006)

The Stern Report



# Main Activities

- Begin the shift from stand-alone science oriented projects
- To including climate in project risk assessments.
  - Andhra Pradesh Drought Study – High frequency moderate impacts events matter
- Finally , needed a pilot of adaptation done at scale and integrated into national planning
  - PPCR (Pilot Program for Climate Resilience)
  - Aimed for a few \$100 million – got \$1.3 billion
  - 9 plus 9 countries



**What does IPCC AR5 tell  
a decision maker about  
adaptation?**

Fig. 1795. — Dronte.



# Highlighted statements (i.e. what the decision makers' advisors might read)

Four adaptation chapters and two SPM sections (random order, personal assessment)

Actionable (iF ... Then ...)	Informative (This is established / possible)	Obvious (Duh!)	Potentially misleading (Are you sure?)
x	Potential of enhancing the role of Local Govt and Private Sector	Increased awareness is often not translated into action	Adaptation is context specific
x	XXXX	XXXXX X	Adaptation is just moving from awareness to planning
	XXXXXX x	XXXXXX x	
x	X xx	XXX x	xx
2.0 (4%)	16.5 (40%)	22.0 (50%)	3.5 (7%)

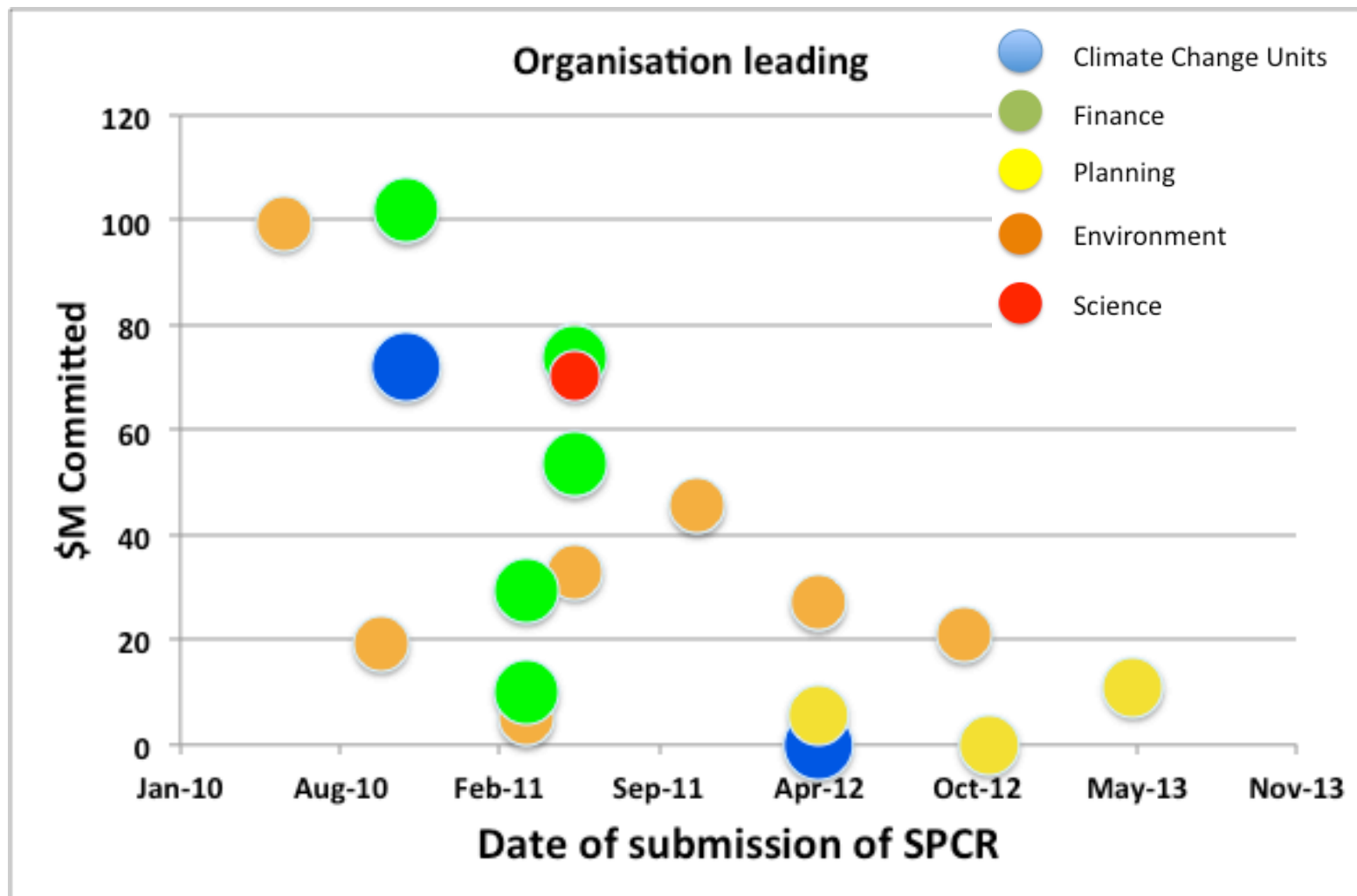
## Missed opportunities e.g. The PPCR

# Pilot Program for Climate Resilience

- A program initiated by the MDBs, to pilot what was to become the Green Climate Fund
- Eventually funded to \$1.3 Billion – 18 countries
- Focus on making climate risks part of development planning
- Greatly exceeds any other singular adaptation financing in total amount and amount per supported country
- Approaching 6 years of experience – many lessons – good and bad – especially for the GCF – comprehensively documented.
- *Substantially mentioned in only one chapter of the AR5*
- There is a string of PhDs to be had!

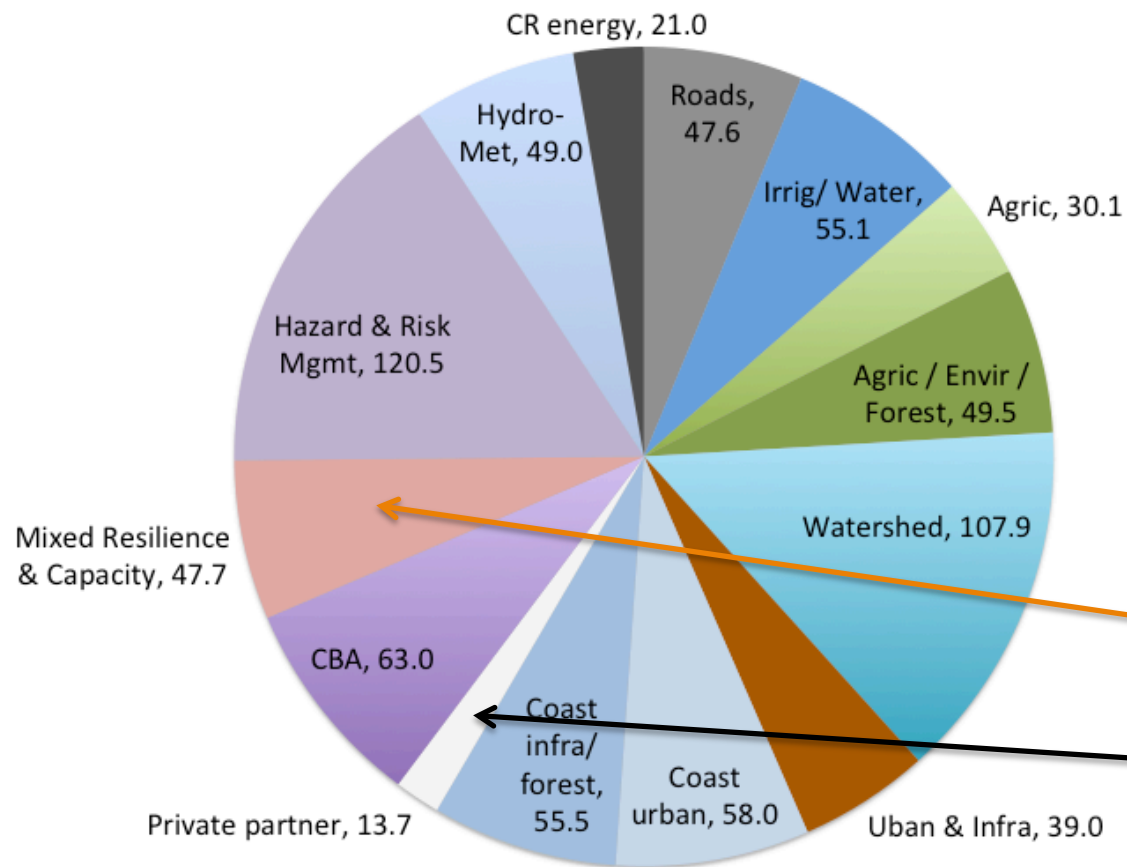


# Does it matter who leads?

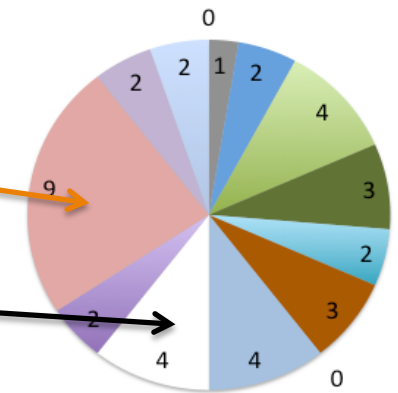


# What type of work is being supported?

## PPCR Approved projects \$M



## Projects in preparation



Samoa etc



# FRONTIERS?



# What are policy makers asking?

- Better forecasts! Gradually accepting limits.
- How will CORDEX change their requests?
  - Better understanding of the uses and limits of downscaling
  - Be ready for requests for seasonal and decadal forecasts
- Which interventions and processes are most likely to build adaptive capacity / resilience and in which circumstances? Theory v. practice disconnect. Developed v. Developing country capacities.
- Do we need transformative changes in our approach? What is transformative change?
- How can we **measure** the effectiveness of adaptation efforts? Especially important if GCF moves ahead.



# Suggestions for the scientific community

- Get rid of meaningless mantras
  - "Uncertainty"
  - "Complex"
  - "Adaptation is context specific"
- Start with what we know
- Not everyone needs to know everything
  - Networks matter
  - Developing country "Centers of Excellence"?
- Do we have the capacity to cope with a 10 fold increase in adaptation activity?

## What we know

- Adaptation is essential - everywhere. But it is not the only issue, and often not the most important issue to both local communities and governments.
- Adaptation is about taking opportunities that will allow human livelihoods to continue to improve. Actions should be based on appropriate evidence based risk assessments.
- The most appropriate actions (if ever knowable) will be context specific.
- Engaging the full range of stakeholders in an informed and empowered way is the ideal – or at least try to get as close to that ideal as feasible.
- Actions must focus on both the short and long term. But Revisit, Re-assess and Revise.
- There are sufficient uncertainties that some form of iterative decision making or adaptive management will be needed (c.f. management of economies)

# Adaptation in the Arab Region







## Adaptation in the Arab Region





A photograph of a white building with two windows. The window on the left is a large, multi-paned window with a white frame, showing a warm interior with several hanging lamps and a small figure on the sill. The window on the right is a smaller, single-paned window, also showing a warm interior. Below the windows, the white wall has the words "I DON'T BELIEVE IN GLOBAL WARMING" painted in red, hand-painted capital letters. The text is reflected in a dark, still body of water in the foreground.

I DON'T BELIEVE IN  
GLOBAL WARMING