How can we foster broader and more effective use of climate information to support decision-making in agricultural systems ?

Guillermo Podestá… and MANY others!

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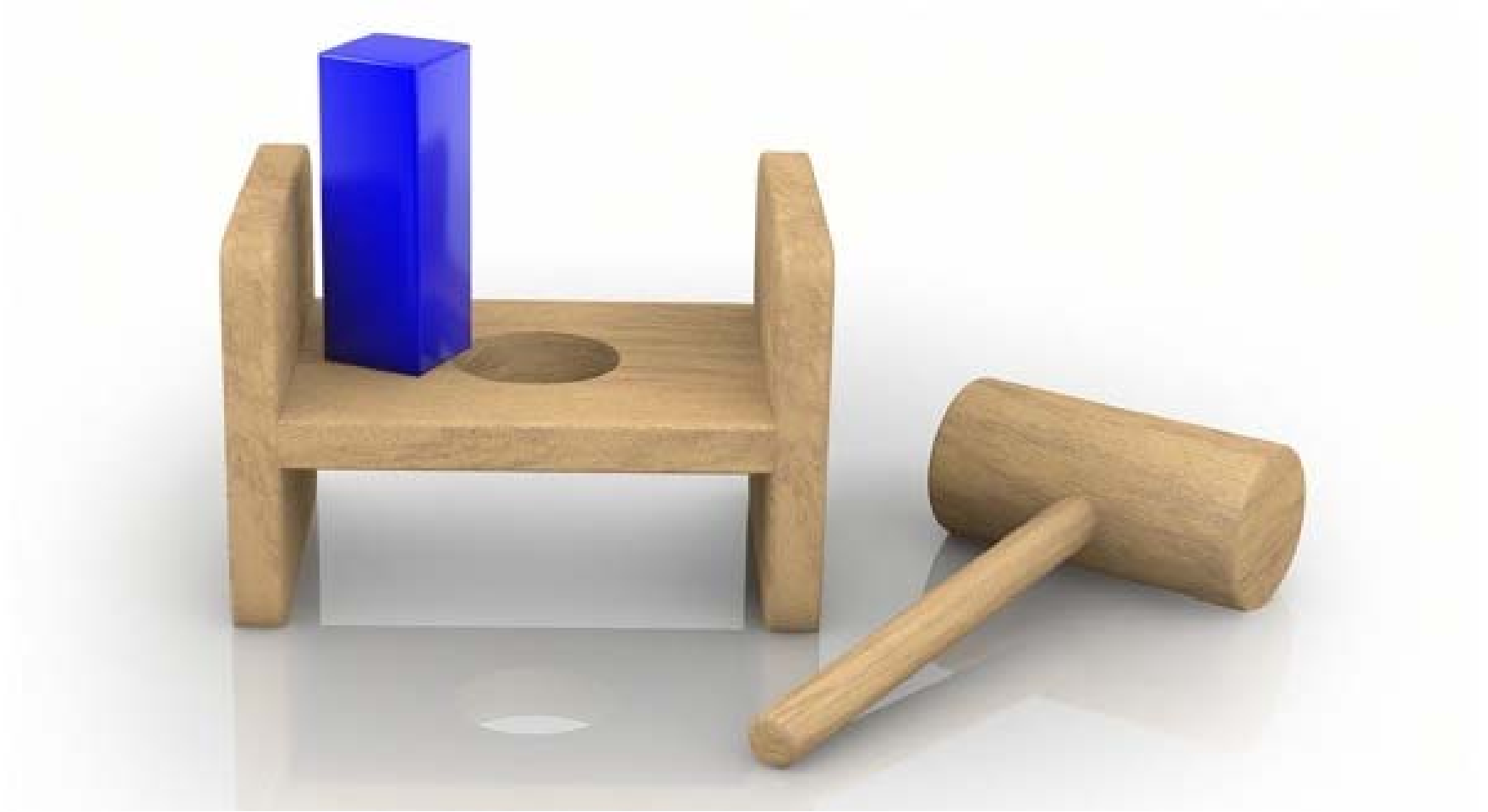
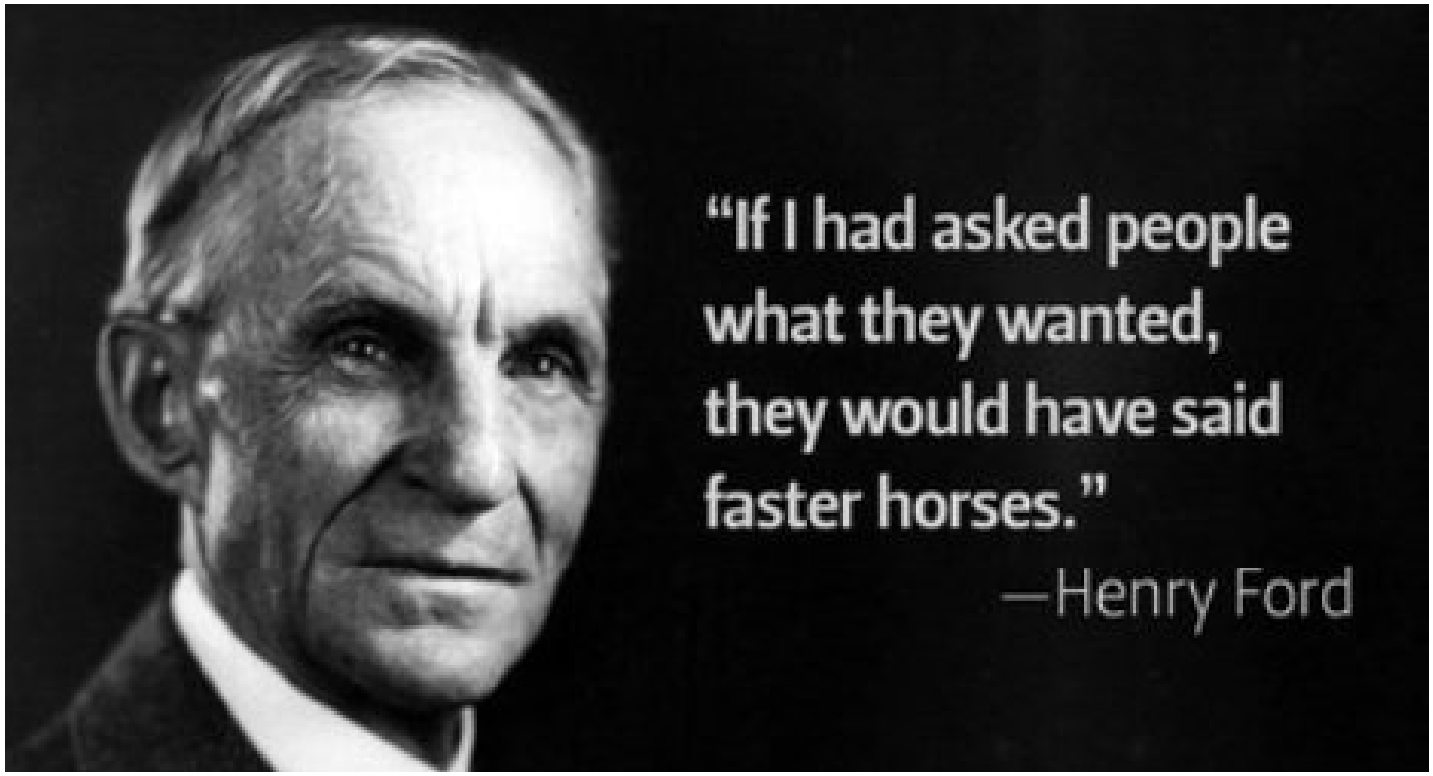
The root of the problem…



BUT… it is not *only* about products!

"What do *they* need?"



My main points…

- Various types of climate info are useful (beware of forecast-centric focus!)
- Agroecosystems have to be framed as complex social-ecological systems
- We need to establish national and regional climate services to support “climate-smart” decisions

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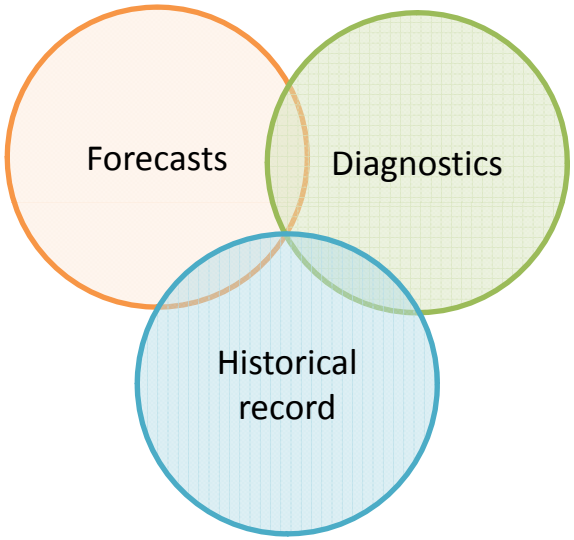
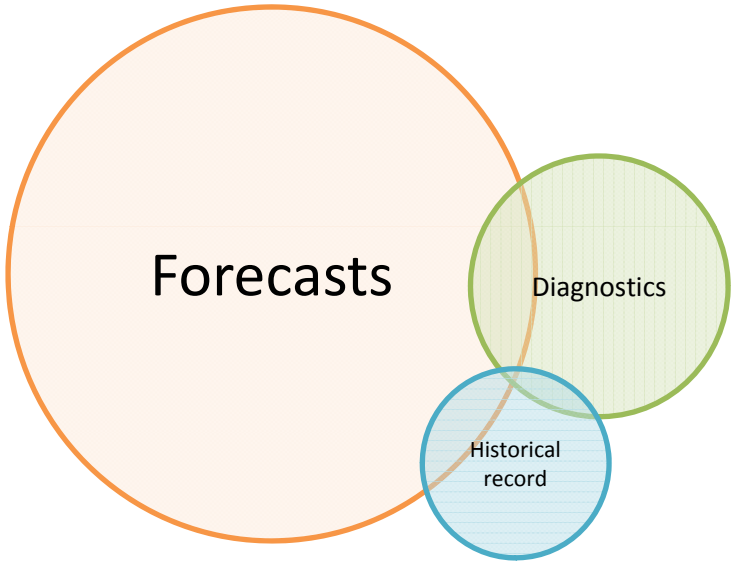
Different types of climate info…

On seasonal scales…





On longer time scales…

"paralysis by forecast"

(or "Let's wait for better forecasts"

There is progress….

- Learn how combinations of info can enhance forecasts (Federico Bert, later today)
- Find out how monitoring can help narrow range of expected conditions (Carolina Vera, Friday)

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Why social-ecological systems?

- Agroecosystems are *complex* (not just complicated!)
  - Multiplicity of scales
  - Non-linear feedbacks
- *Practical* implications
  - Factors other than climate *also* influence decisions
  - Need to understand dynamics of entire system
    - Aggregated (emergent) effects? Winners/losers?

Why social-ecological systems? - 2

- All complexities of ecosystems PLUS all the quirks of human decision-making
- Need to understand decisions (i.e., how climate info is used) under risk / uncertainty / ambiguity

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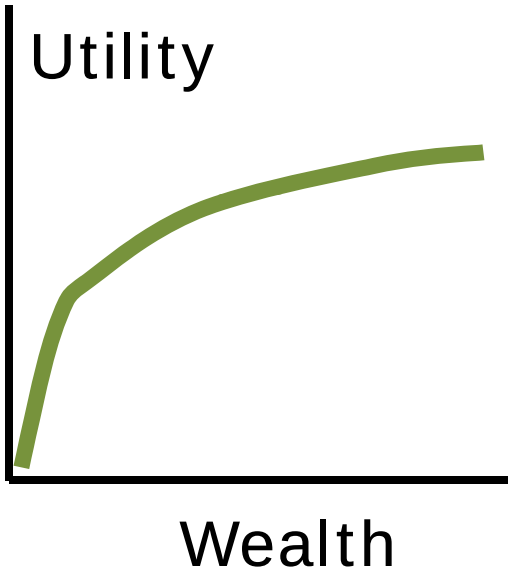
Does more info = good decisions?

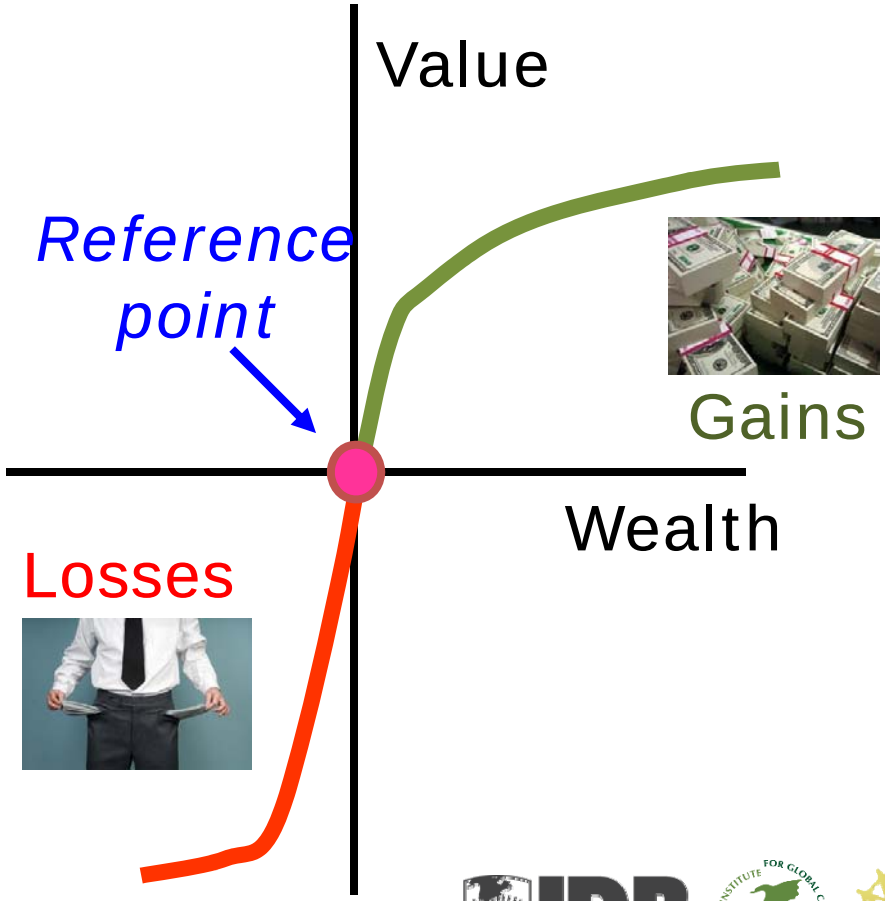
- What IS a good decision?
- We need to understand:
  - Goals (what do DMs try to achieve?)
  - Risk attitudes
  - Social norms
  - Social roles

What are people trying to achieve?

Utility theory



Prospect theory



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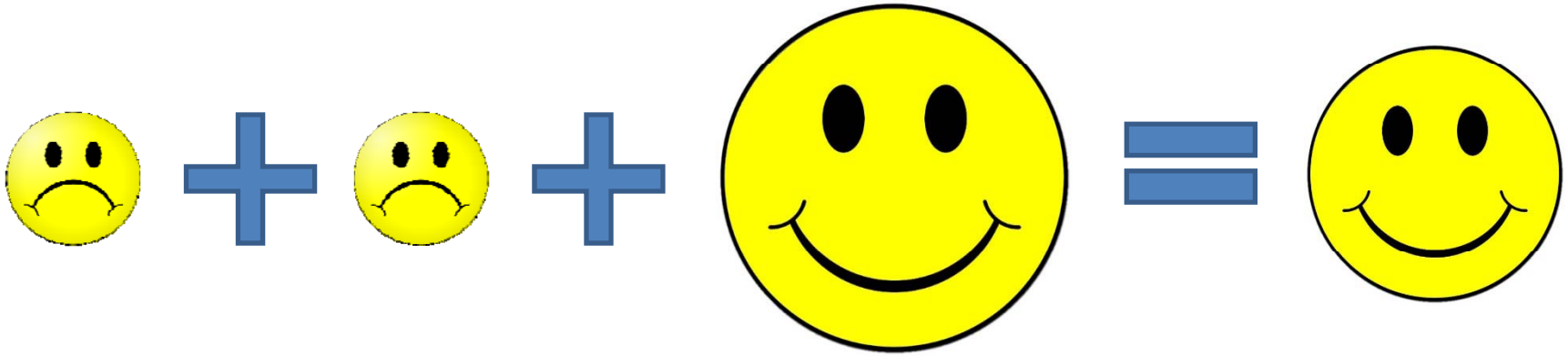
Loss aversion

- Losses hurt *a lot more* than gains

OK… *so what?*

- Farmers are so afraid of losses that they are overly cautious and forego potential gains
  - Need to assess gains/losses on a longer time frame



Year 1 Year 2 Year 3

Other cognitive biases…

Bias	Possible solution
Limited pool of attention / worry 	Checklists
Confirmatory bias	Discuss diagnostics/forecasts with peers or advisors
Overconfidence	????

Uncertainty?

"Managing under uncertainty"

Beyond seasonal forecasts…

Seasonal (3-6 months)

Interannual (1 a 5-7 years)

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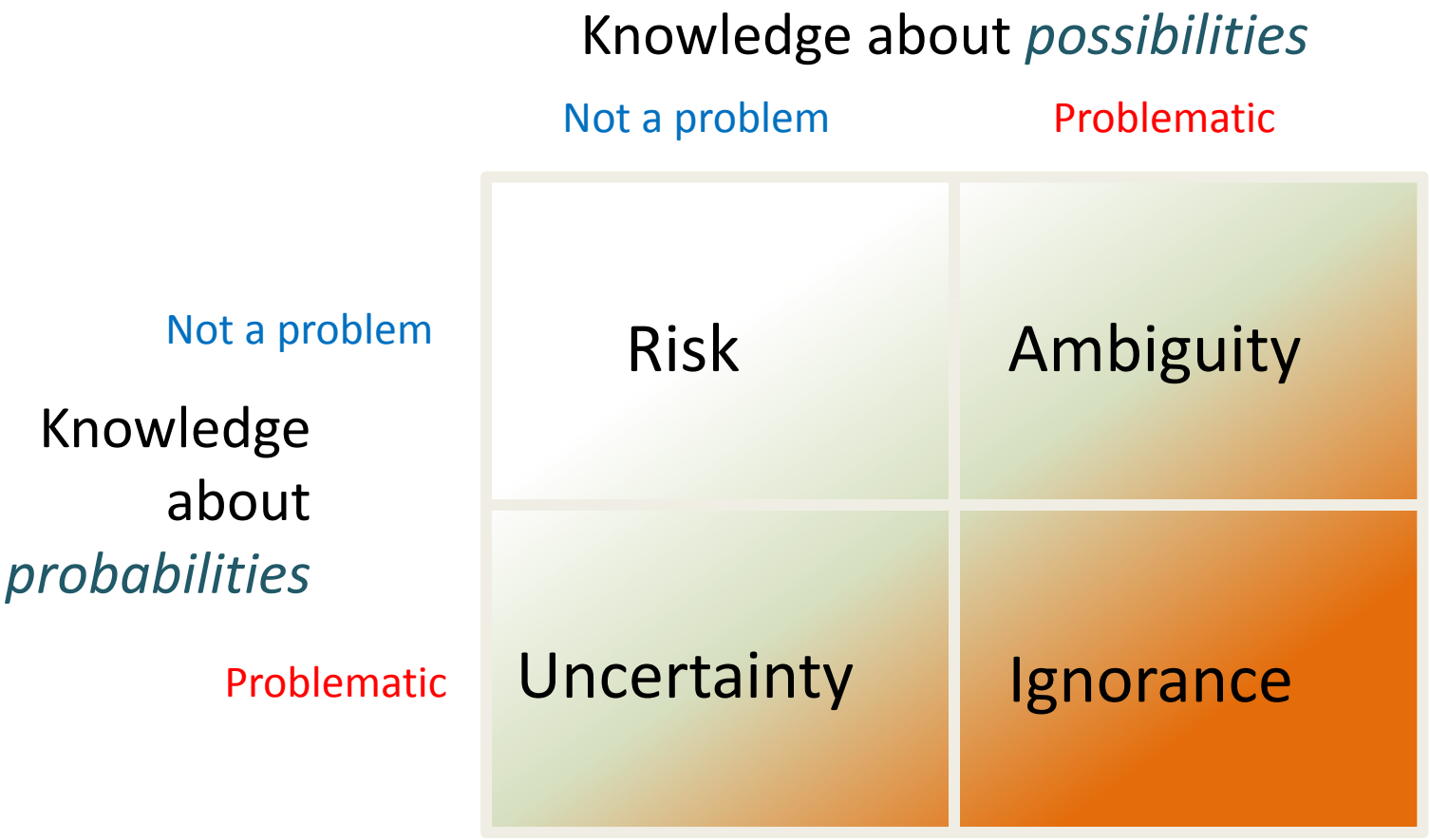
Types of incertitude



Redrawn from A. Stirling, Nature, 2010

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Robust Decision-Making

- Explores a broad range of futures
- No probability statements
- Identifies a set of robust strategies
  - Not a single, "best" solution like optimization
  - Robust: perform *"sufficiently well"* under a wide range of plausible futures

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My two cents on climate services

- To build the social capital necessary for climate adaptation we need sustained provision of climate services
  - Research projects have shorter durations
- BUT… operational climate services MUST be supported by an active research program
  - HUGE opportunity for WCRP in LA and C!

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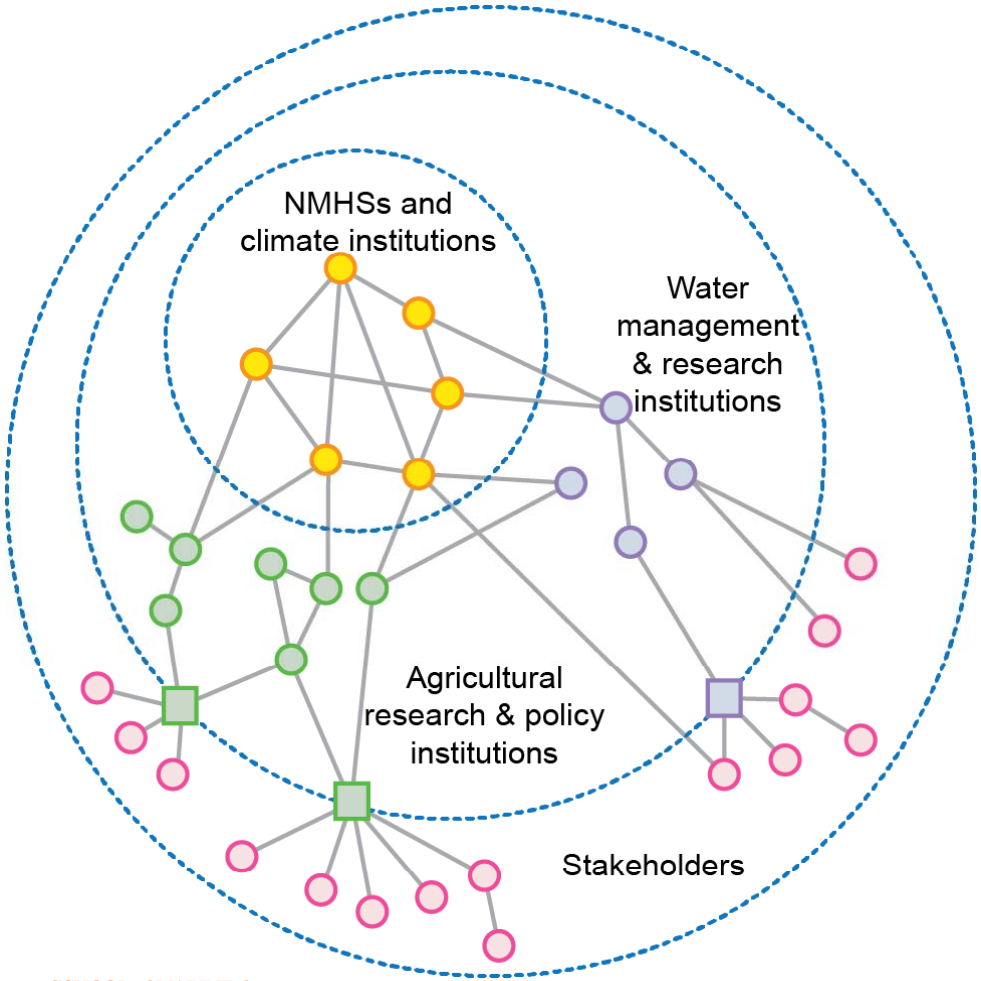
My ~~two~~ three cents on climate services



- Knowledge networks (Hewitson, WCRP Denver), NOT linear transfer
- Sectoral institutions MUST be part from the beginning

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With sincere gratitude!

Inter-American Institute for Global Change Research

- Cooperative Research Network 2 – CRN 2031
- Cooperative Research Network 3 – CRN 3035

Inter-American Development Bank

- Hydroclimatic services in the Río de la Plata Basin

U.S. National Science Foundation

- Dynamics of Coupled Natural & Human Systems
- Decision Making Under Uncertainty

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