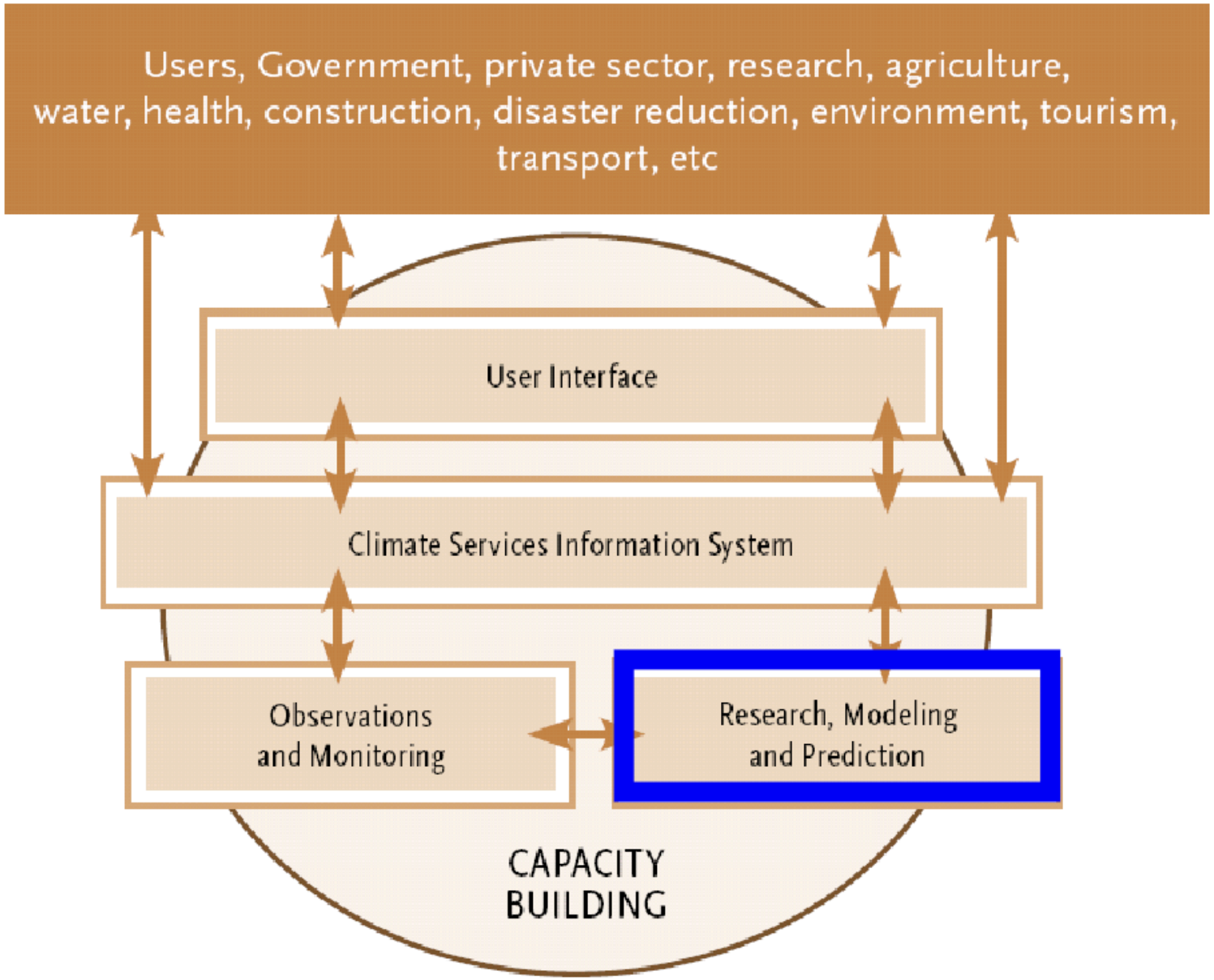
Pillars of GFCS



Source: Filipe Lúcio

Research, Modelling and Prediction

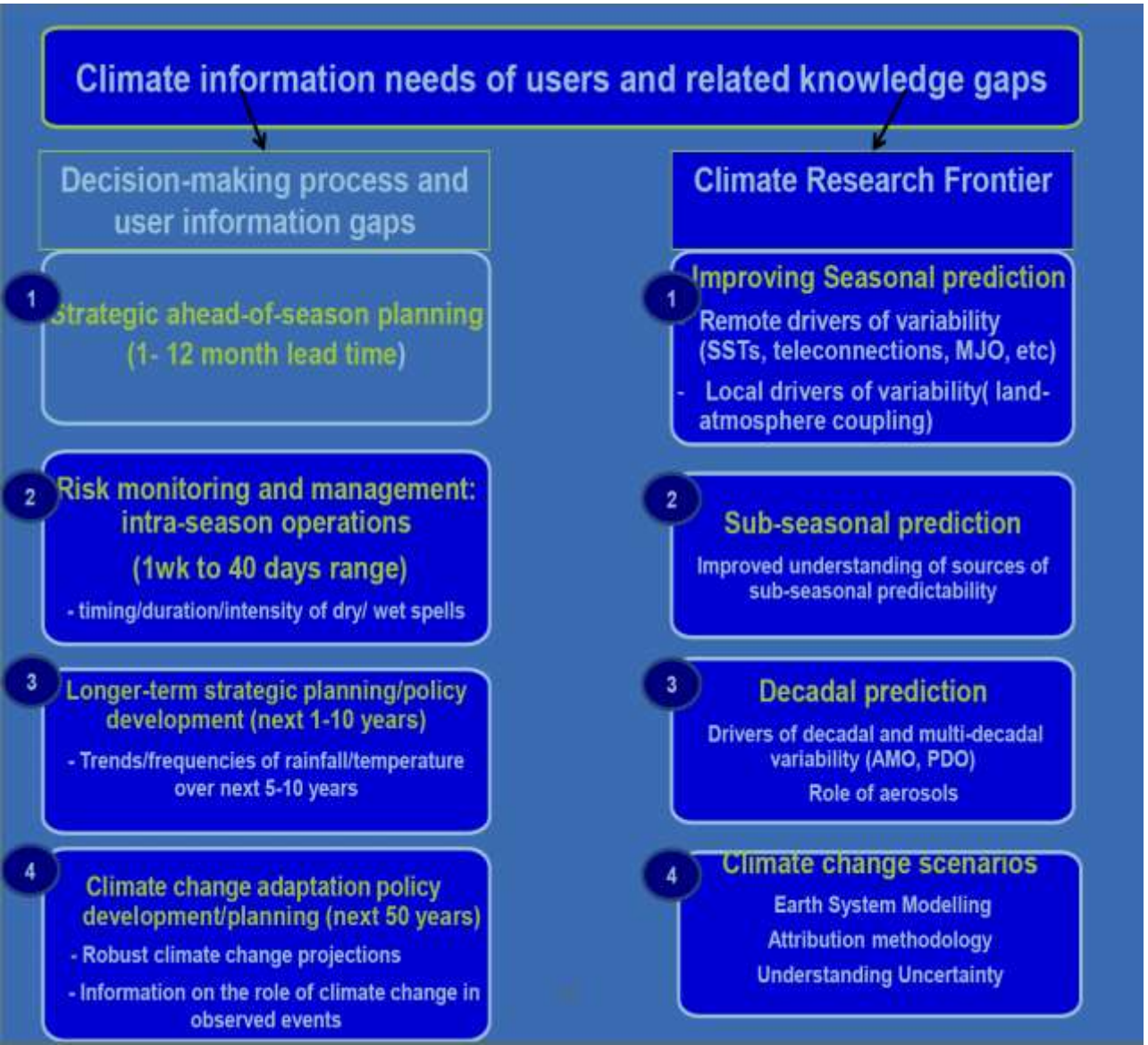
- Key Stake Holders for RMP: IITM, IMD, NCMRWF, INCOIS, NPTI, ICAR, NWA (of CWC), Academic Institutes
- Current Status: Seasonal, Monthly and Extended Range Forecasts, Decadal Forecasts are yet to be operationalized, Climate Projections.
- Major Gaps: Skill is limited to 2 weeks for extended range and Seasonal is limited to AISMR and some homogenous regions and monsoon zone. Lack of Communication between Climate Products generators and Users/Application developers. Data (QC) availability across domains (both Climate and sector data).
- Capacity Needs: Many of the users (other than power industry; NPTI) are not really using climate information for their sector applications, hence we need to . Capacity building exercise to train various modelling groups to understand the requirements from other sectors should be initiated.
- Links with Other GFCS: Capacity Building, Observations and Monitoring for evaluation and calibration.

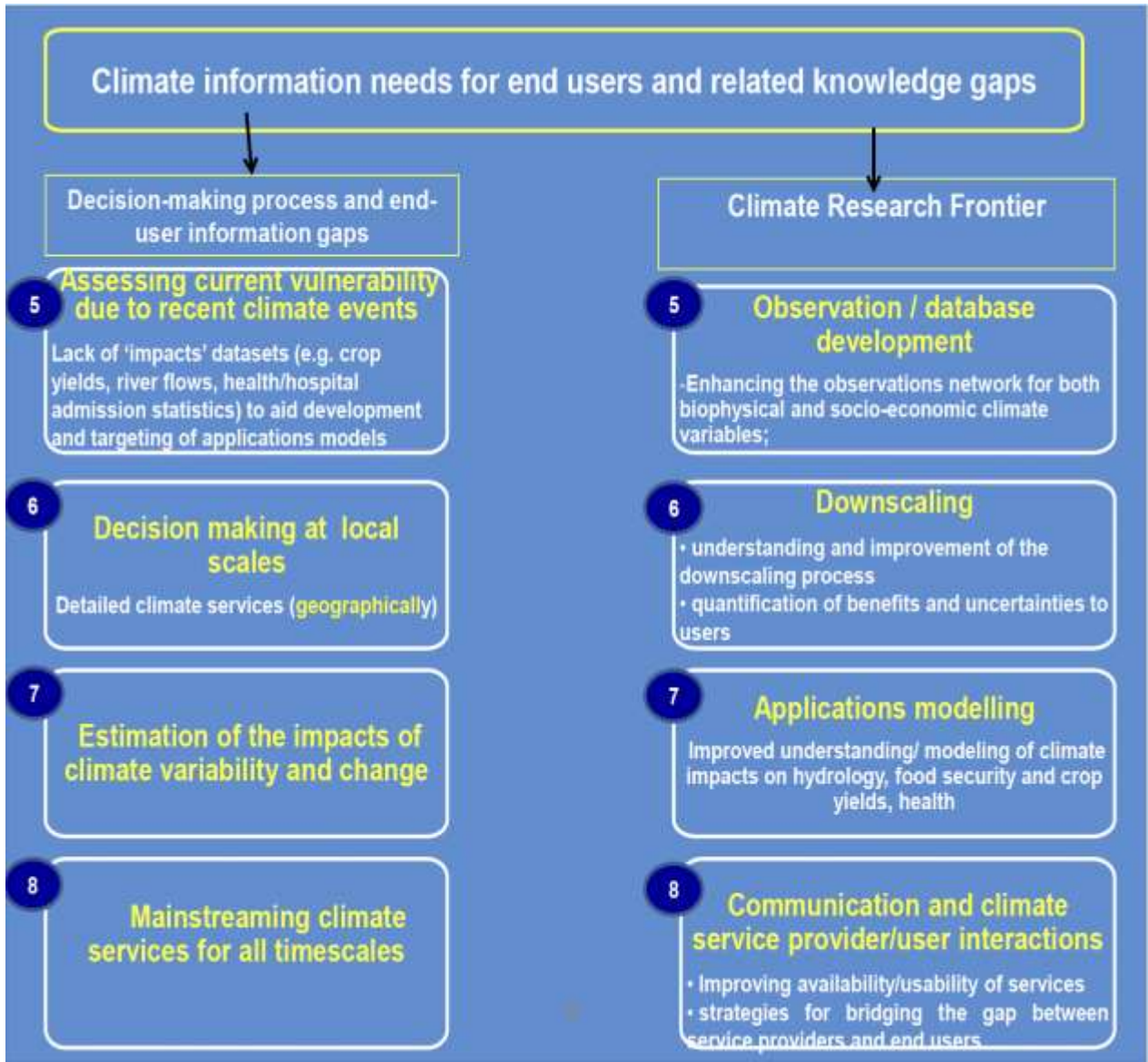
Research, Modelling and Prediction

- Near-term:
  - Workshop to sensitize how the modelling/predictions are happening across different sectors, climate models, Power models, agriculture models and hydrology models. (First priority)
  - Capacity Building to sensitize the user sectors what products can be generated for different sectors and their needs and how to use them.

  Long-term: Make all forecasts available across the NFCS stakeholders and other data for calibration of models across sectors.

Information Required from RMP for GFCS





Research, Modelling and Prediction

Gaps

- Communication between communities of scientists and practitioners
- Last mile between science products and service-oriented climate information
- Lack of seamless suite of climate products for contiguous time scales from weather to centenial climate projections
- Limited or unknown predictability for a range of key time-space scales
- Dealing with uncertainty

The scope of the GFCS RMP can be defined as:

- Encompassing a combination of fundamental and applied climate research;
- Embracing atmospheric sciences, oceanography, hydrology, cryospheric sciences, terrestrial and marine biogeochemistry, research on socio-economic and human systems, and research on climate–dependent applications in key areas of human activity;
- Considering the Earth as a system, i.e. focusing on the significant interactions of all its components including human and natural subsystems;
- Including information on the past climate largely based on paleoclimate research and observations, and prognostic information on the future climate up to the end of this century and possibly beyond based on exploiting our understanding of predictable processes and phenomena;
- Covering a continuum of time scales (i.e. beyond the typical two-week limit of deterministic weather prediction) and relevant space scales (i.e. national, regional and global);
- Combining deterministic and probabilistic sources of climate information to evaluate climate information uncertainty, limits, and value for decision-making;
- Including all types and methods of research such as observations, field and model experiments, process studies, pilot predictions and projections, assessment, production and validation of relevant datasets and derived information, etc.;
- Including policy-relevant, but not policy-prescriptive, information;
- Facilitating both cutting edge research and capacity development (CD) at the global, regional, and national levels.

World Climate Conference-3

“major new and strengthened research efforts are required to increase the time-range and skill of climate prediction through new research and modelling initiatives; and to improve the observational basis for climate prediction and services, and the availability and quality control of climate data.”

Interface with other pillars of GFCS

- Capacity Development
- The availability of relevant climate observations is essential for climate research, so the Observations and Monitoring (OBS) pillar of GFCS is fundamentally important to the RMP pillar.
- One of the RMP pillar's key objectives will be to improve availability and access to science-based climate products through CSIS (Observations, Simulations and analysis and synthesis of the resulting climate information) → Decision Making

Gaps

- Knowledge and understanding of certain climate aspects that limit our ability to develop plausible climate information.
- Communication gaps between climate scientists per se, research communities active in the GFCS initial priority sectors (water, food and agriculture, disaster reduction, and human health),and providers of climate information to users

Necessary Conditions for RMP

- Active engagement of the climate science and corresponding applied science communities
- Commitment of climate information developers and climate service providers to work together with users to identify information products necessary for practical applications in various socio-economic sectors
- Involvement of funding agencies and university scientists, along with support from leading agencies at the global, regional, national, and local levels
- Efficient planning of RMP activities (engagement of stakeholders from beginning)
- Adequate funding, human resources, and computing/data transmission and information technology (IT) support
- Resourceful and targeted CD and related education in core and applied climate research
- Availability and sustainability of adequate observations for the Earth System
- Creating an environment in which all communities involved in the RMP activities can work together on design, development and delivery of climate information to produce helpful guidance on how to use efficiently the available observations, data, model-based results, and fundamental scientific understanding.

Implementation Plan

- Developing new, or improving existing, climate products based on sound science in close coordination with the user community;
- Creating a platform, opportunities and incentives for scientific groups to progress from simply investigating scientific problems to creating pilot products, technologies, methods and models for existing and envisioned climate services;
- Making such products available and evaluating how they can be used effectively in the domain of climate services, whether experimentally or routinely;
- Developing applied research in climate-dependent sectors of human activities, creating possibilities for effectively using climate information and services.