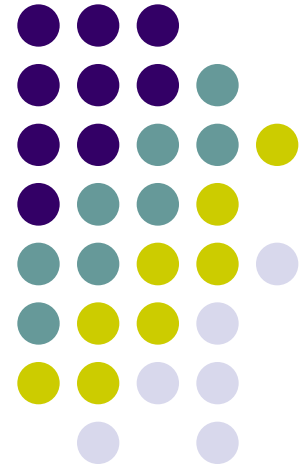
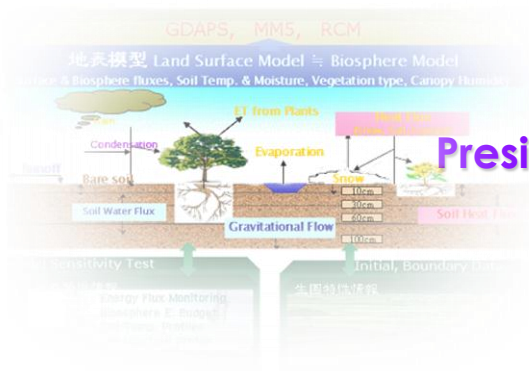


GFCS Implementation for AgroMeteorology from the Perspective of CAgM / WMO



Byong-Lyol LEE & Raymond Motha

President of Commission & Coordinator for GFCS
Commission for Agricultural Meteorology
WMO



World Climate Conference-3

Better climate information for a better future

Geneva, Switzerland
31 August–4 September 2009



World
Meteorological
Organization
Weather • Climate • Water

❖ WCC-3 decided to establish a
Global Framework for Climate Services
to strengthen production, availability, delivery
and application of science-based climate
prediction and services



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GFCS: Objectives



- **Provide a cooperative framework** in which all nations, International organizations, scientists and sectors will work together to meet the needs of users;
- **Enable users to benefit** from improved climate information and prediction;
- **Mobilize climate science** globally to advance the skills of seasonal-to-interannual and multi-decadal climate predictions to generate and provide future climate information on an operational basis;
- **Foster mechanisms** for sharing new advances in science and information through a cooperative global infrastructure.

Pre-requisites for Climate Services



- **Available:** at time and space scales that the user needs,
- **Dependable:** delivered regularly and on time,
- **Usable:** presented in user specific formats so that the client can fully understand,
- **Credible:** for the user to confidently apply to decision-making
- **Authentic:** entitled to be accepted by stakeholders in the given decision contexts
- **Responsive and flexible:** to the evolving user needs, and
- **Sustainable:** affordable and consistent over time.

GFCS Implementation Priorities by WMO

1. **Capacity building** in developing countries

- Linking climate service users and providers. <= WIS (GISC/DCPC)
- Building national capacity for climate services. <=WIS (NC/DCPC)

2. **Strengthening the Climate Services Information System (CSIS)**

- Standardizing products; promoting WIS; facilitating access to, use of GPC products <= WAMIS next phase
- Strengthening regional climate capabilities through establishing and promoting RCCs and RCOFs <= Regional Pilot Projects

3. **Building capacity to implement the User Interface Platform**

<= WAMIS next phase

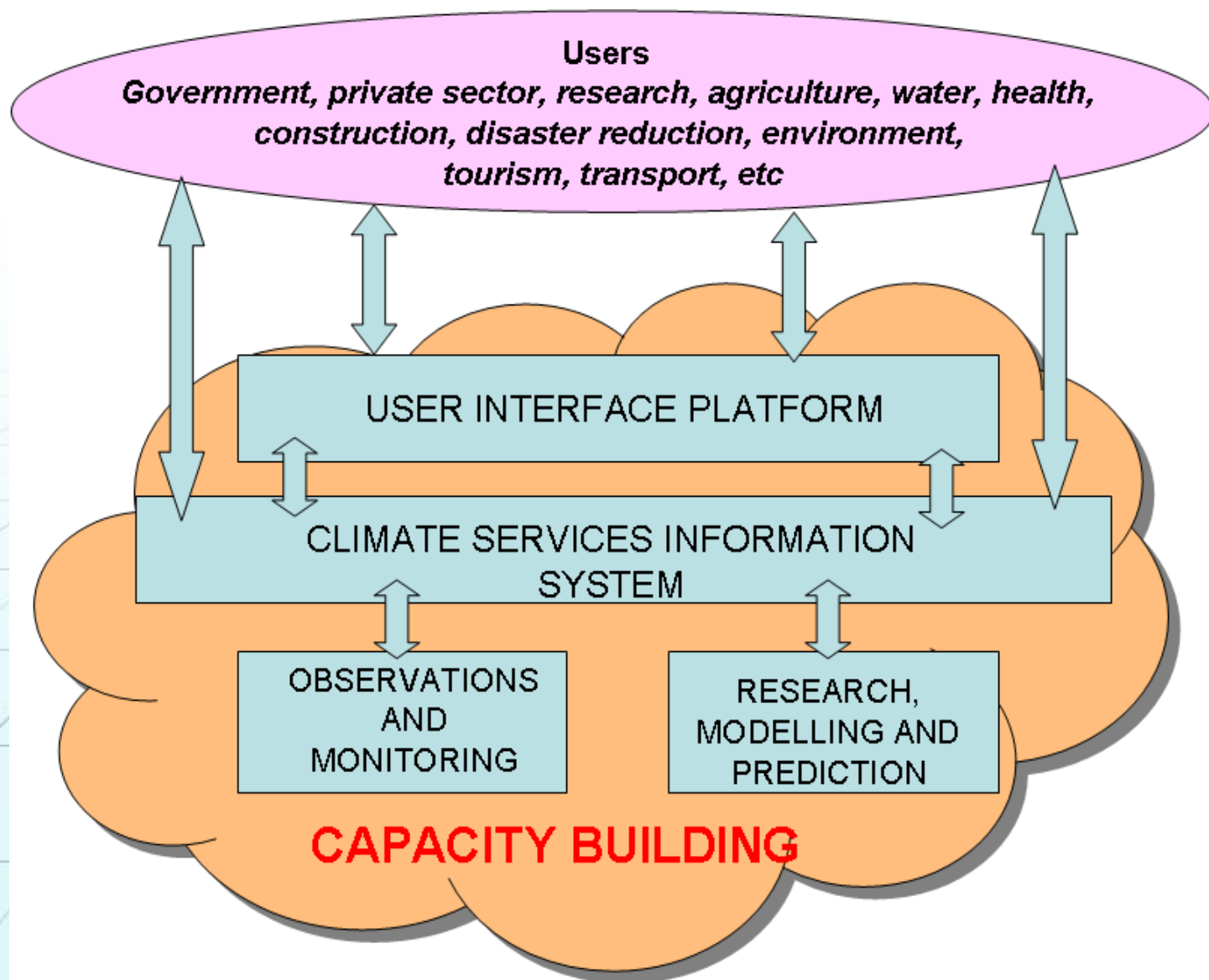
4. **Improving climate observations** in data sparse areas

<= WIGOS : Global monitoring networks : crop, phenology, drought, etc.

5. **Building the capacity of the climate research** sector

<= INSAM : Regional/Global federations of AgMet societies

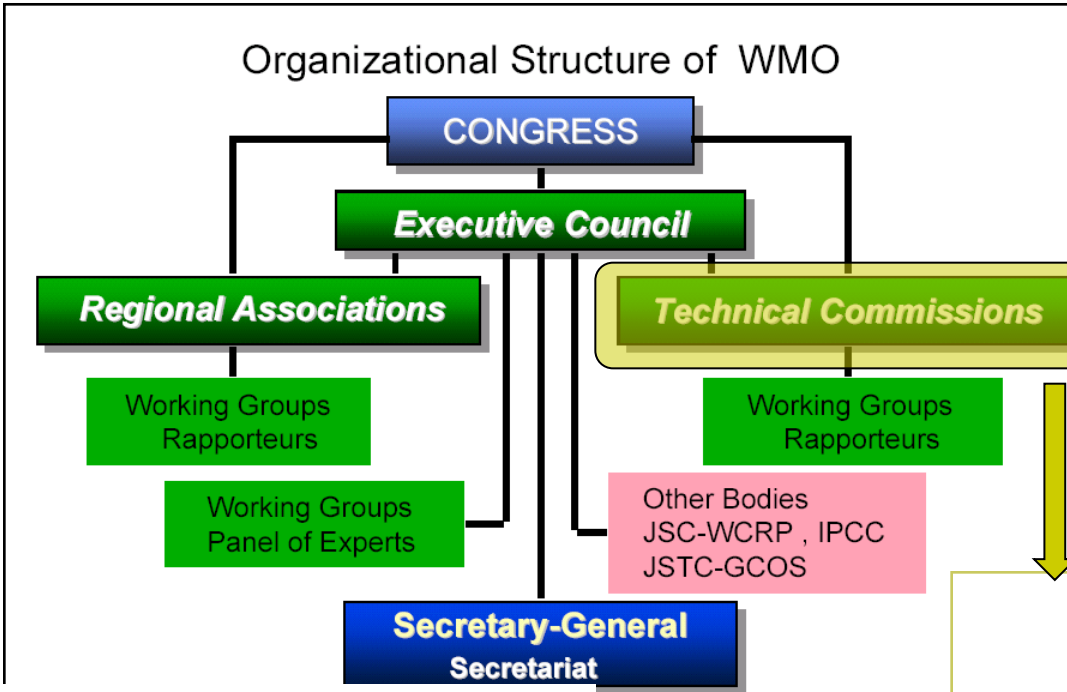
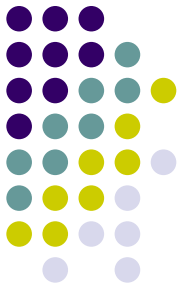
GFCS Structure



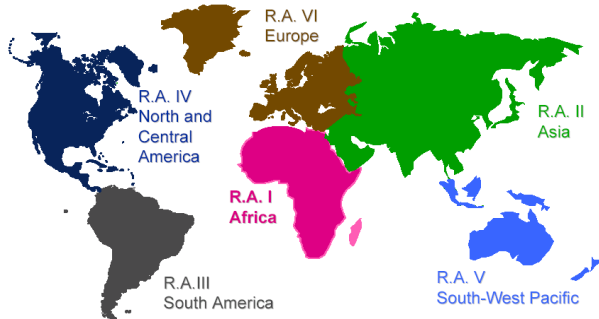


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Commission for Agricultural Meteorology



Regional Associations



Technical Commissions

Basic Commissions

- Commission for Basic Systems (CBS)
- Commission for Instruments and Methods of Observations (CI MO)
- Commission for Hydrology (CHy)
- Commission for Atmospheric Sciences (CAS)

Applications Commissions

- Commission for Aeronautical Meteorology (CAeM)
- Commission for Agricultural Meteorology (CAgM)
- Commission for Marine Meteorology (CMM)
- Commission for Climatology (CCI)

WAMIS (World AgroMeteorology Information Service)



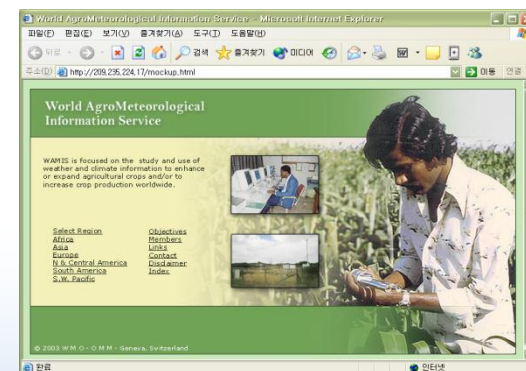
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WAMIS – 1st Step for information sharing

Web Portal

information sharing

- ➔ XML-based service : standard schema development
- ➔ Machine translation : multi-lingual interfaces
- ➔ Operational applications based on Web service architecture
- ➔ Tutorial interfaces for real practices



GRID Portal

Resource sharing

- ➔ Forecast-based AgMet Services for researcher / extension
- ➔ Benchmarking on AMBER (DWD), expanding with DSAT
- ➔ NCAR (GDAS, MM5), DWD (GME, LM) as NWP
- ➔ Super ensemble of Seasonal Forecasts (APCC / KMA, etc.)
- ➔ GISC / DCPC dedicated to WAMIS will be established (NCAR, DWD)
- ➔ LIS (NASA) as a framework for LSM (GDS / LAS + GRID)

NWP-based Early Warning System

Prediction Model System

<http://dmss.ksc.re.kr/dmss.html>

Observation System



Raw Data



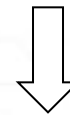
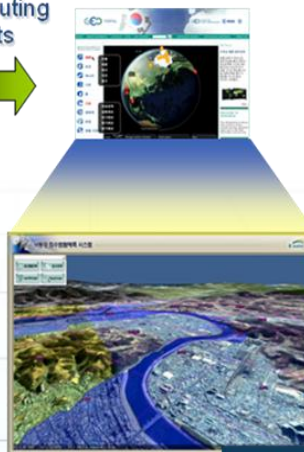
Grid Portal



Computing Results



Information Service



Visualizing the Results on the Web

Overlay the output of the MM5 model on the Google Earth

Computing Grid Resources



Horizontal

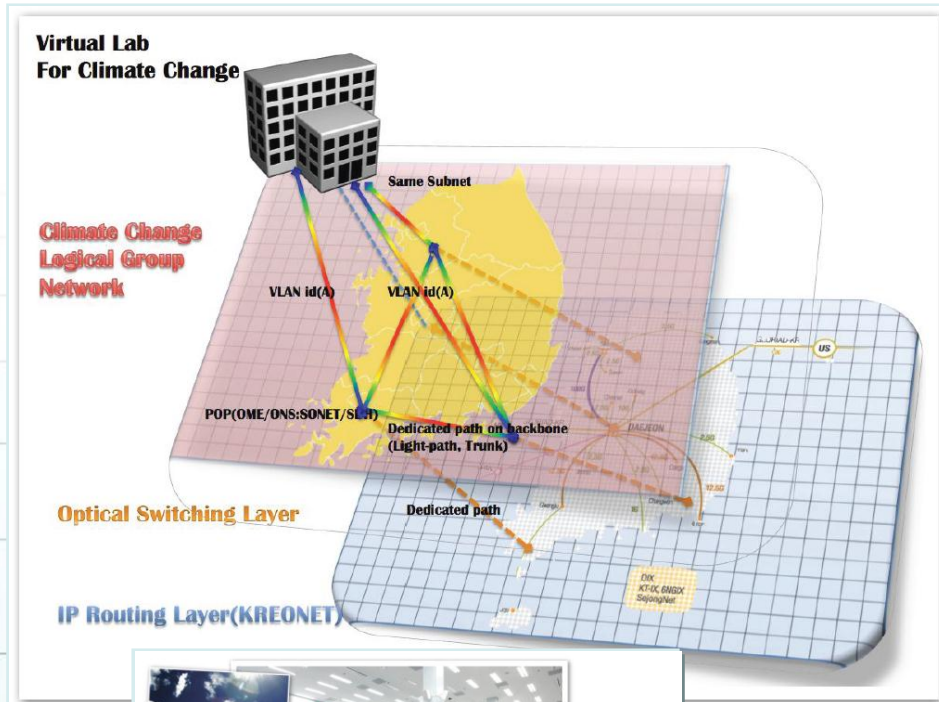
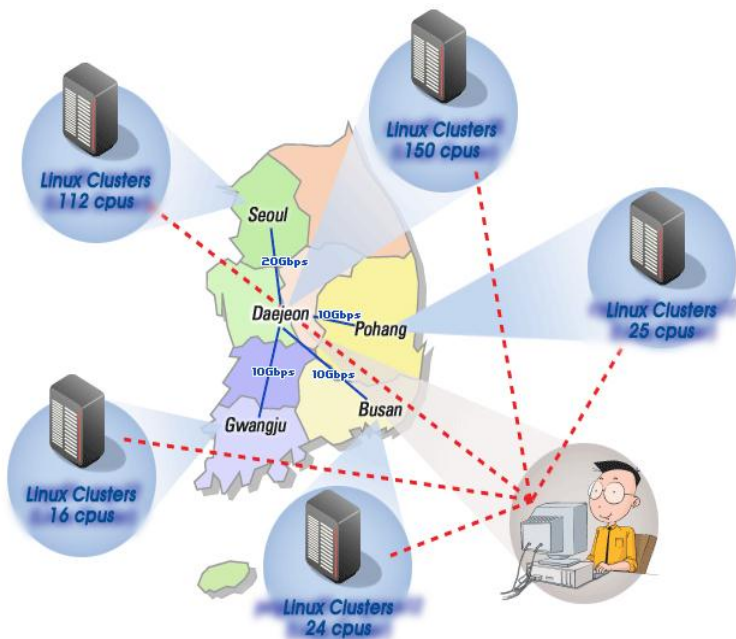


Vertical



ICT resource sharing system

IT resources from PLSI Project for WAMIS next phase



Climate Change

INSAM Implementation strategy



❖ Implementation Strategy

■ Governance as Global Federation of AgroMeteorology society

with regional members from

- East/ South/Central Asia
- North/Latin America
- Central Asia
- Africans (4 sub-regions)
- Oceania

◆ Convene in parallel with CAgM

Global Federation of AgMet Society(GFAS)



❖ Mission :

- to strengthen INSAM for complementing with WAMIS,
- to discuss on the feasibility of next phase INSAM
- to consider simultaneous/parallel convene of new INSAM meeting with CAgM session

❖ Issues : How to establish regional associations, who will take care?

- RAI : jointly help subregional agmet society meeting when exists.
- RAII : China/Japan/Korea, India, Central Asia
- RAIII : Already exists
- RAIIV : North A. MS A. Caribbean
- RAV : SE Asia, Oceania
- RA VI : .Europe, Eastern E.

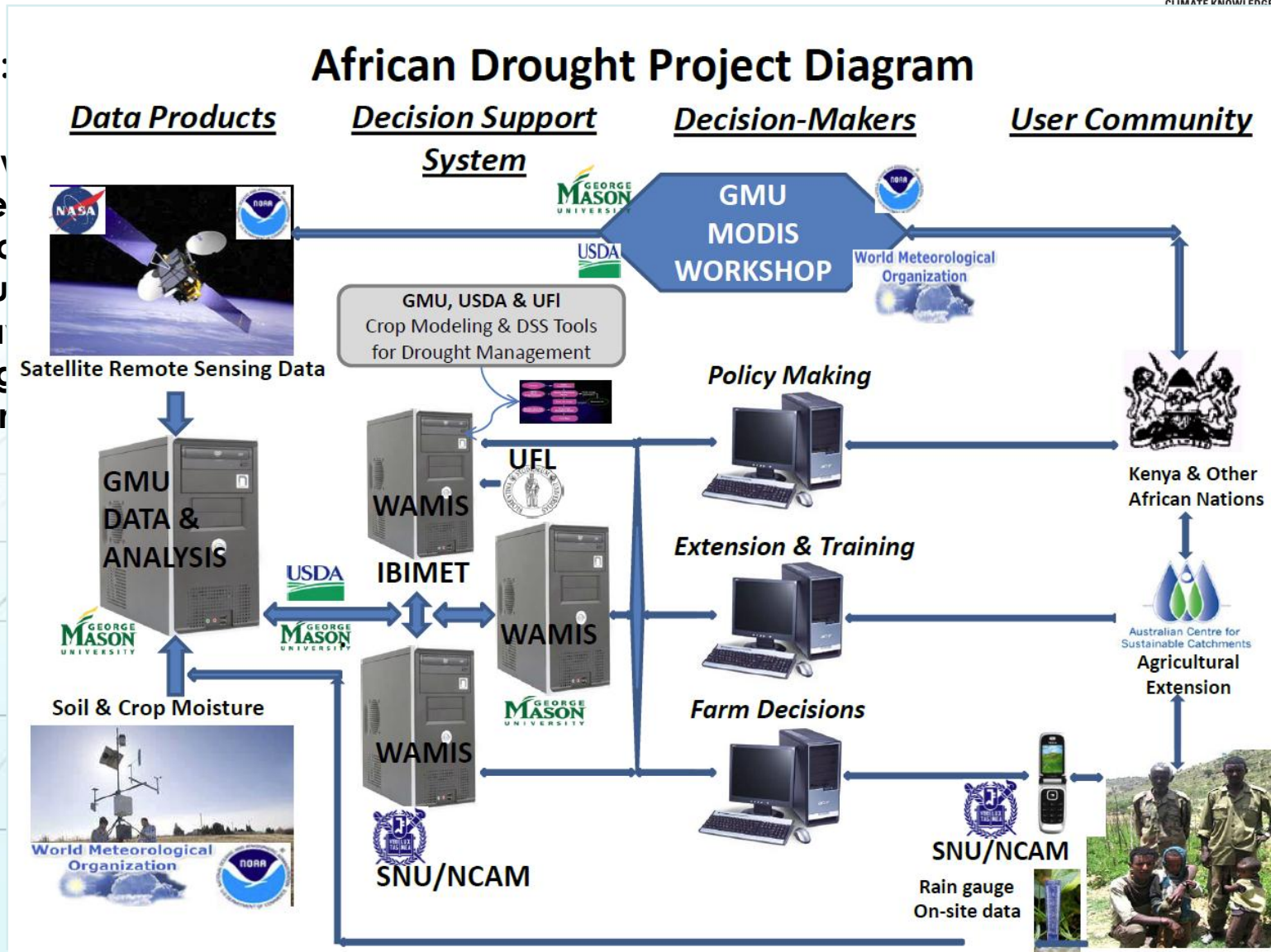
Regional Pilot Projects of operational AgMet



❖ Mission :

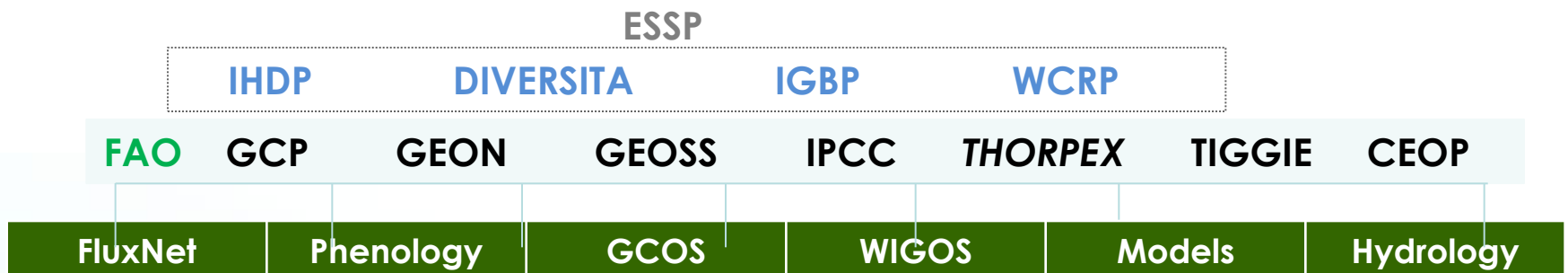
❖ Issues :

- RAI : (Sue)
- RAI I : (Zho)
- RAI II : (Bru)
- RAI V : (Ra)
- RAV : (Rog)
- RA VI : (Sir)





External Partnerships beyond WMO



Monitoring with CAgM

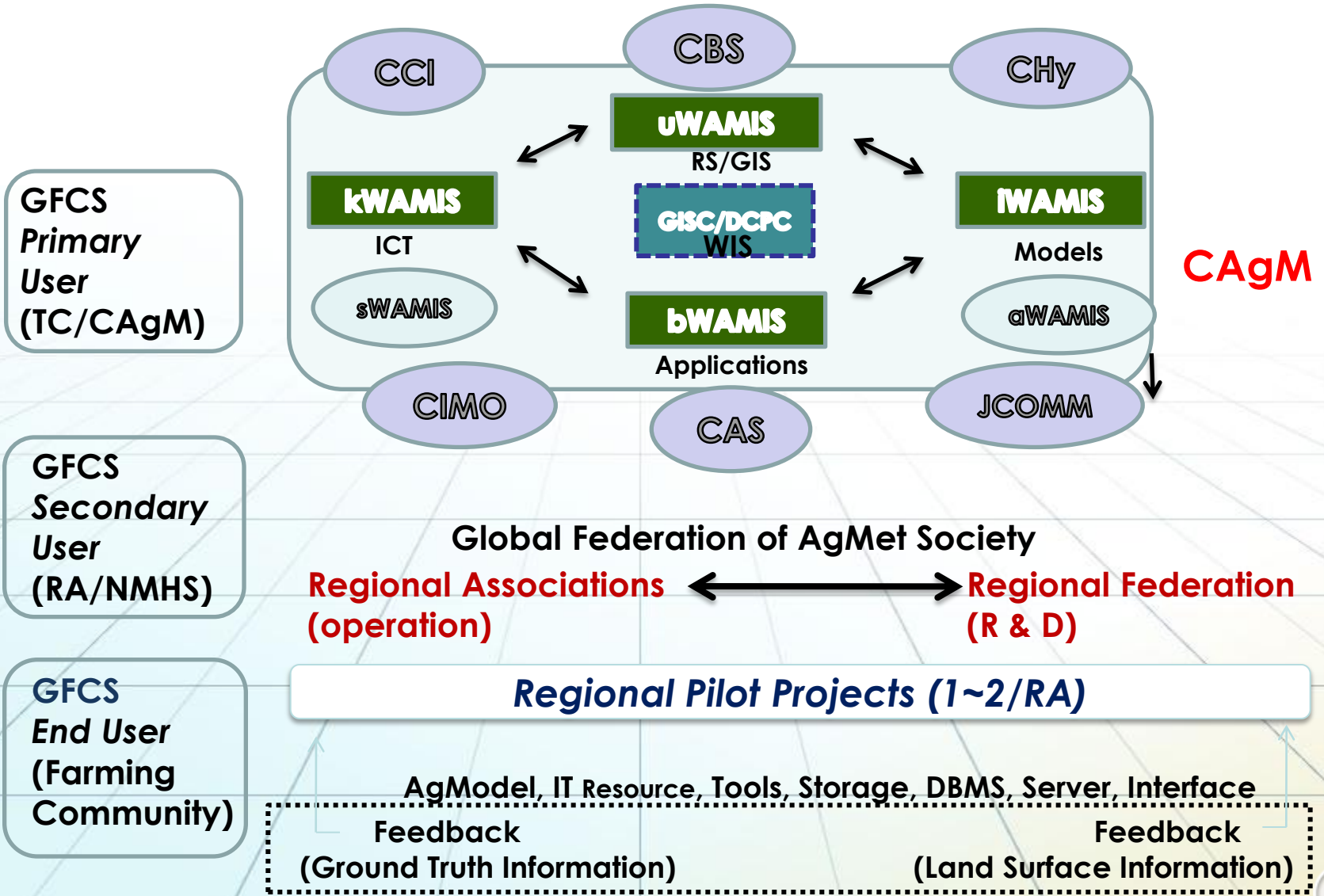
- GAMOS(Global AgroMeteorological Outlook System)
- GDEWS(Global Drought Early Warning System)
- GLUMS(Global Land Use Monitoring System)
- GWHAS (Global Weather Hazard Assessment System)
- GPPON(Global Plant Phenology Observation Network)

Services via WAMIS

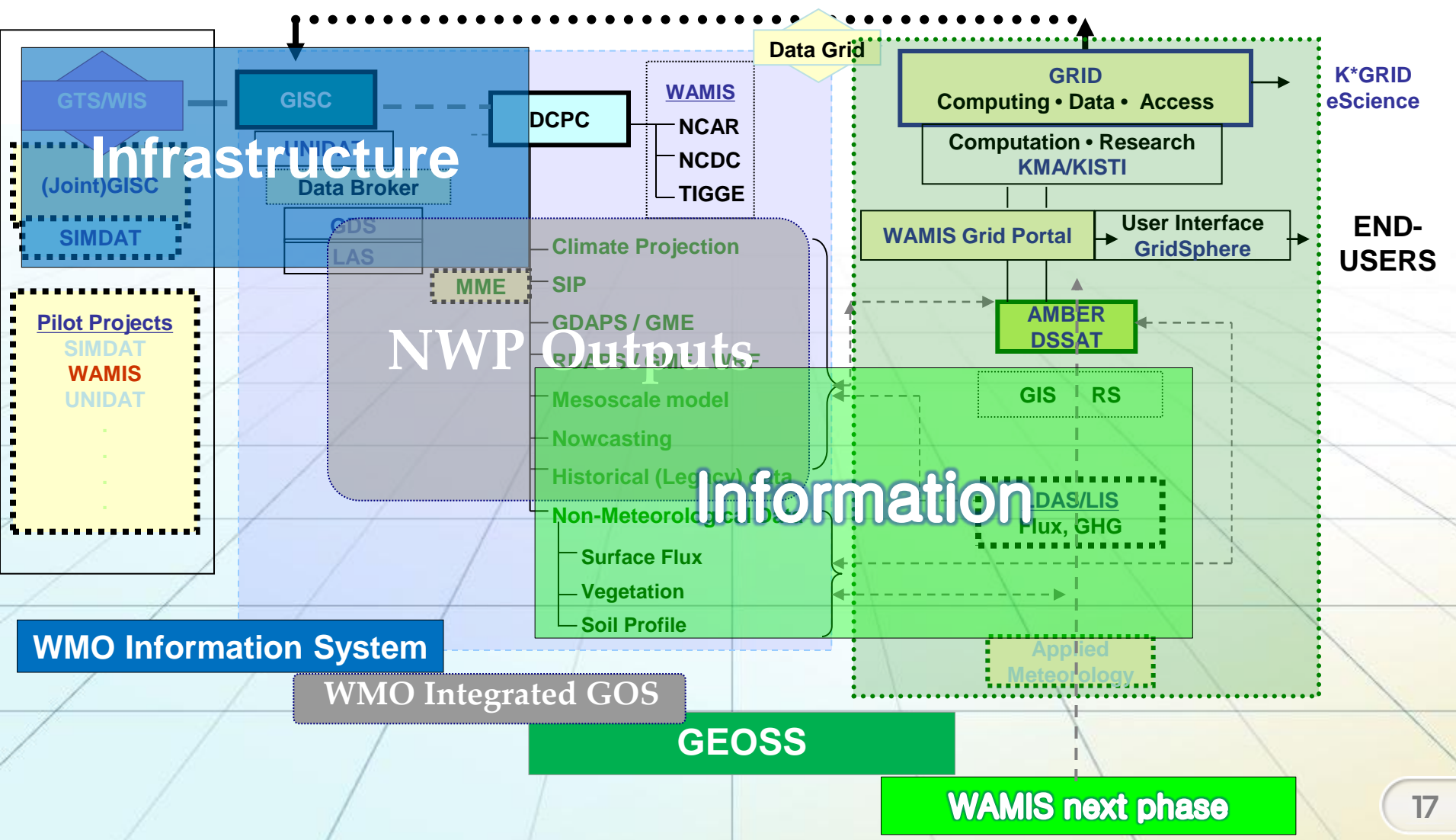
Supporting NWP's available : **WRF/MM5** **GME/UM** **MME**
 NOAA/KMA DWD/UK GPC-/RCC/APCC

Climate services expected
CC Scenario **Climate Monitoring** **Short R. Med R, Monthly, Seasonal, decadal**
 NCAR/ESSP JAWF/MET-BROKER NCAM/NWS RCC COLA

Partnerships among TCs/RAs

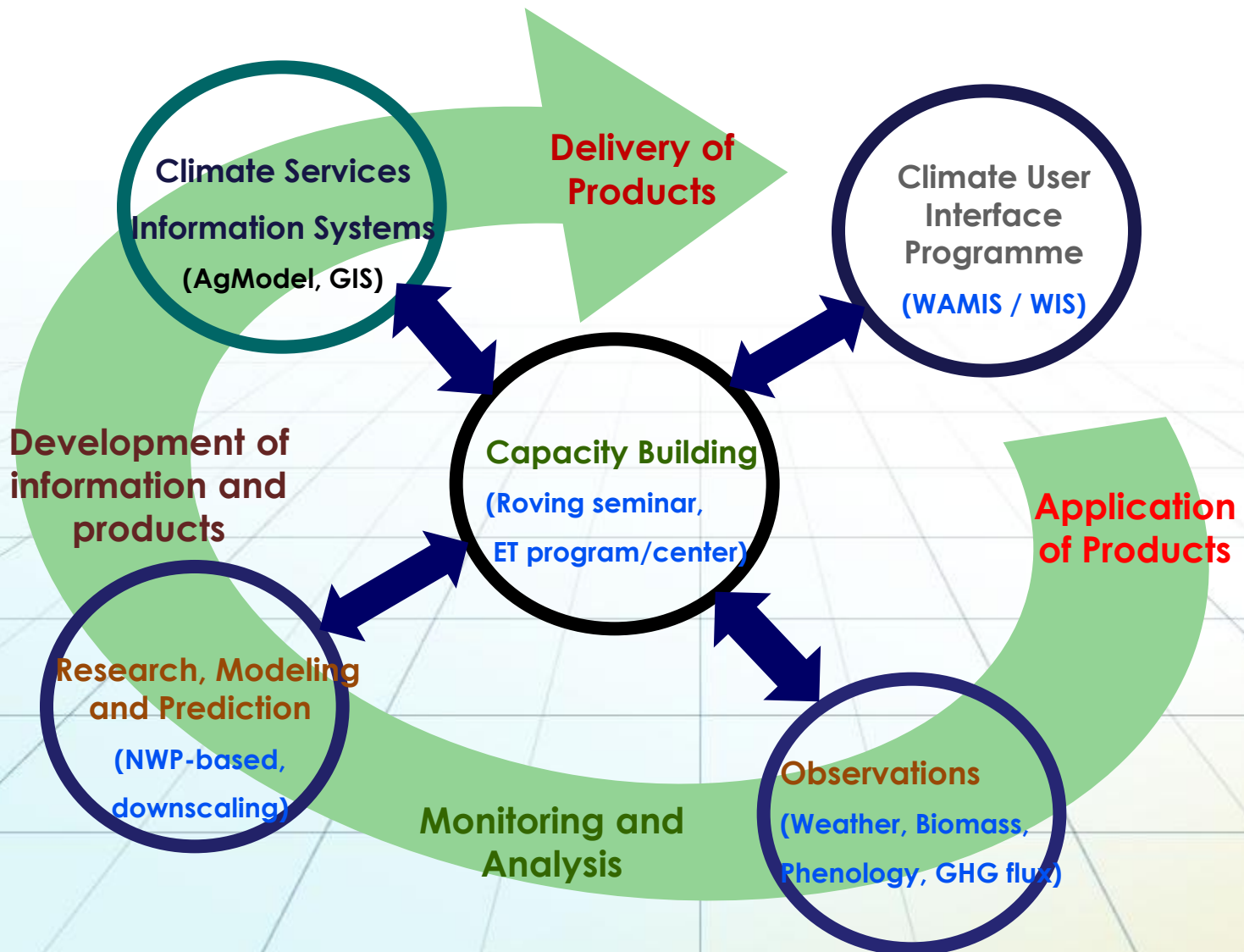


GFCs Components of CAgM





Climate Service Scheme by CAgM



Implementation Strategy for GFCS in CAgM



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1. WAMIS Next Phase

- WAMIS mirrors in each RAs
- WAMIS implementation : contents, tools, resources, infrastructure, interface, service
- new Governance : maintenance/operation, feedbacks from users/stakeholders, supports

2. Regional Pilot Projects

- Identification of existing/candidate projects
- Collaborating mechanisms, with Ras/TCs

3. Federation of AgMet Society (INSAM next phase)

- Regional federations (existing/potential)
- Governing mechanism including joint society meetings with CAgM

4. Education/Training/Outreach

- Strengthening current system
- Accommodation of emerging user requirements
- Collaborations among centers now/future (center of excellency in AgMet)

5. Global Monitoring Networks : crop, phenology, drought,

- Collaboration with global efforts : GEOSS AG-0702 (crop monitoring/risk management)
- Joint networks : ISBM/CBD (tree/bird/insect/germs/coral phenology)
- Integration of existing/potential domestic/regional networks :

6. Collaborations with relevant international programs/institutions

- INFITA : Informatics in Agriculture
- FluxNet : GHG/Energy flux monitoring, Caron tracker, LDAS
- Geant/Tein2/APAN/Gloriad : high performance networks

7. Participation in international occasions

- UNCCD COP-10(2011), Ocean EXPO (2012), ISAM2012, ISBM2011, IMDMPI (?)

WORKING TOGETHER

Towards a Global Framework for Climate Services



World
Meteorological
Organization

Weather • Climate • Water

World
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Organization