



A Brief Development Perspective

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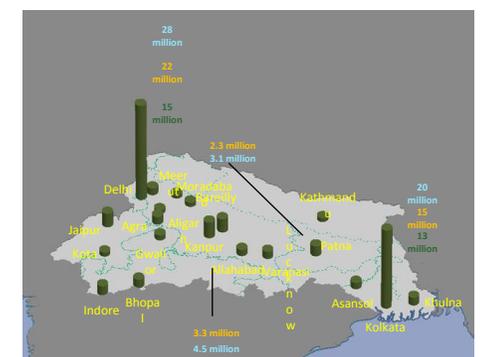
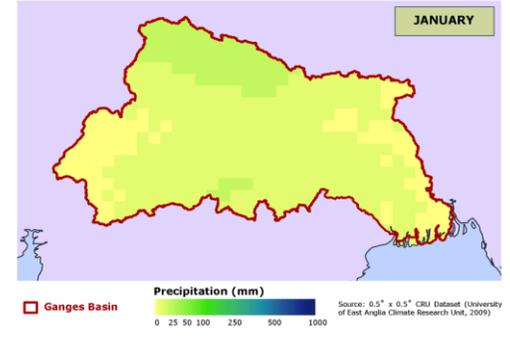
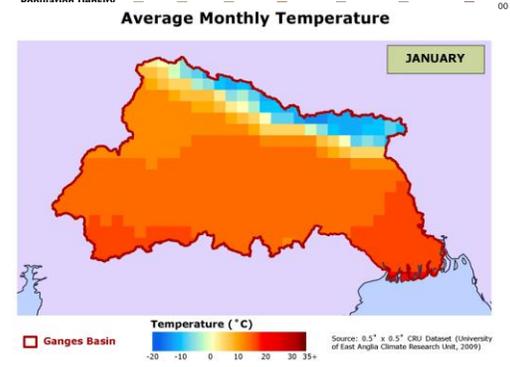
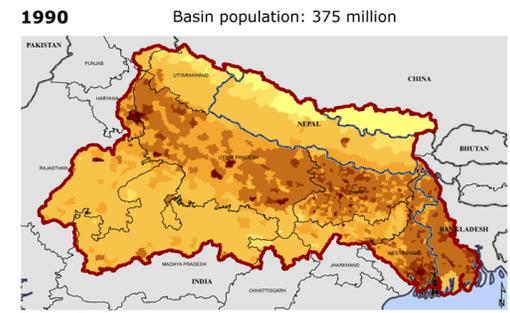
International Workshop on Evapotranspiration Mapping for Water Security

Preston Auditorium, The World Bank

September 16, 2015



A Spatial Perspective...

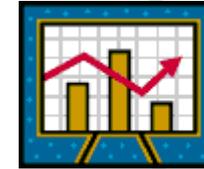


Typical Multiple Development Objectives in Water Resource Systems

Triple Bottom-Line Needs

Economic

- Fueling sustainable growth and shared prosperity
- Investment net benefits, O&M
- Commodity exports (e.g. power, agriculture)
- Reducing imports
- Enhancing regional cooperation...



Social

- Access to basic services
- Poverty Alleviation/ Jobs/ Livelihoods
- Equity/ Gender/ Affordability/ Vulnerable/ Indigenous People
- Reducing Resettlement/ Migration
- Managing climate stresses...

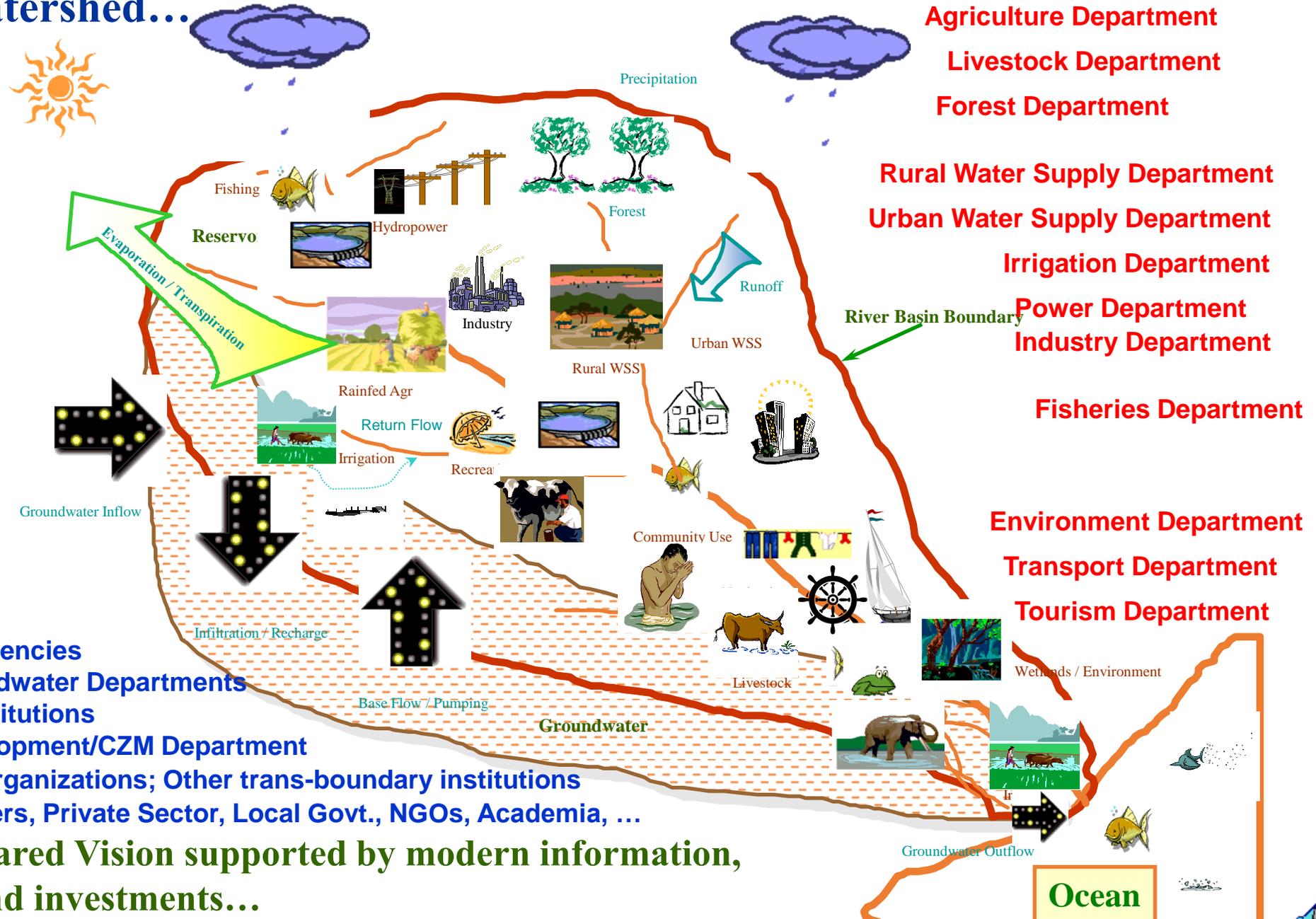
Environmental

- Resource Sustainability
- Managing water quality
- Enhancing ecosystem services
- Reducing erosion/ siltation
- Managing climate risks...



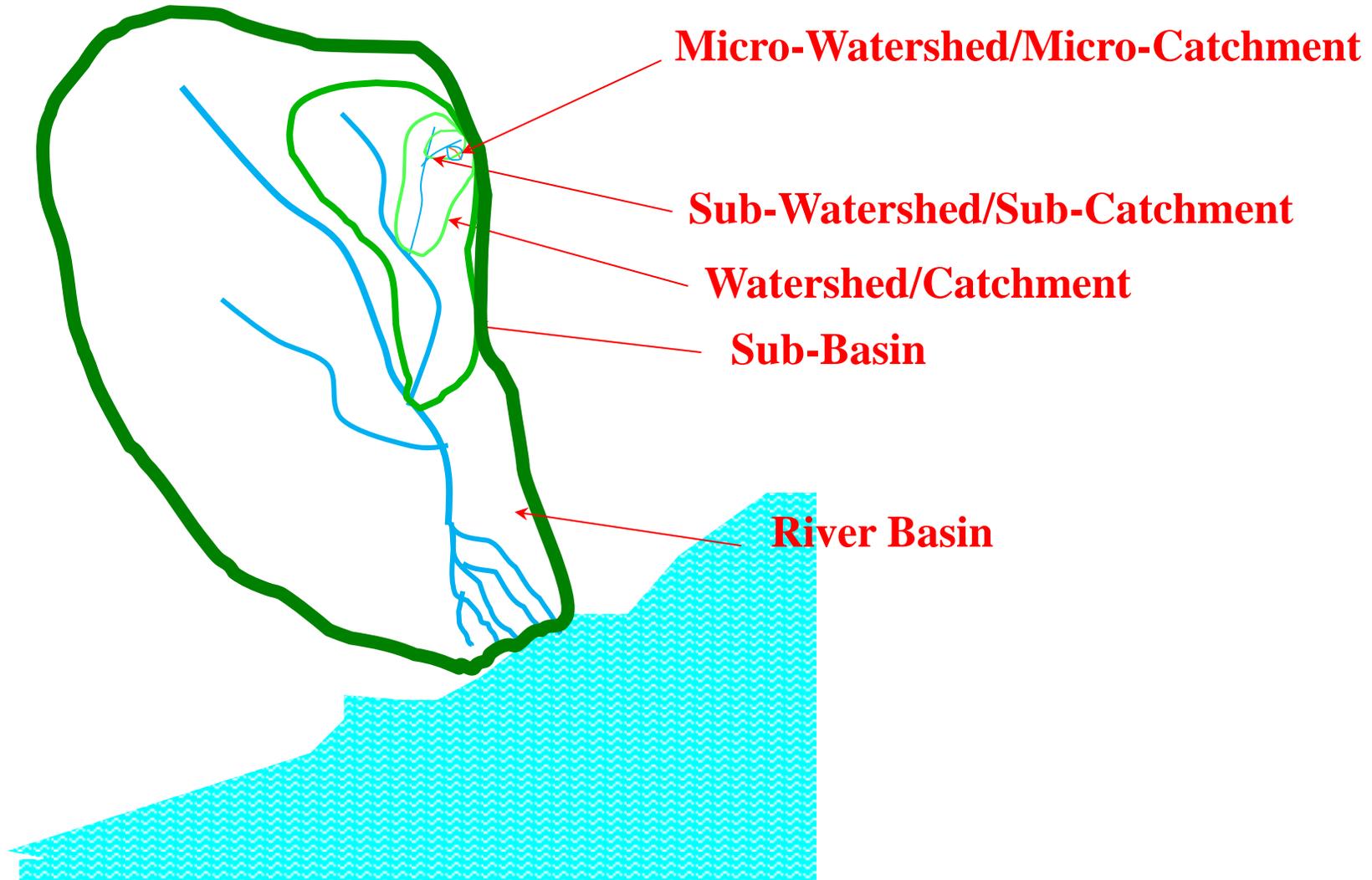
Multiple sectors, multiple institutions, linked by water and natural resources...

A Typical Watershed...



...Need for Shared Vision supported by modern information, institutions, and investments...

Basin? Watershed? Catchments?



What's Broken?

Information

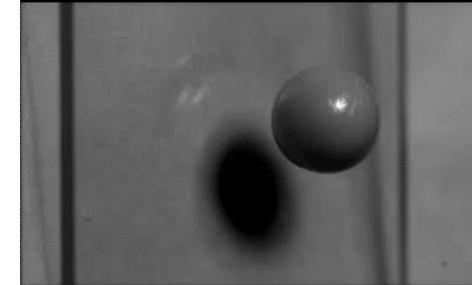
- Data coverage and quality
- Widespread use of modern analytical tools
- Public access to data, tools, and knowledge products

Institutions

- Technical capacity
- Meaningful stakeholder involvement
- Decision making
- Collaboration/ Partnerships

Investments

- Huge infrastructure deficit (power, transport, agriculture, sustainable land management...)
- Inadequate monitoring and forecasting systems
- Poor office infrastructure and equipment
- Investment coordination

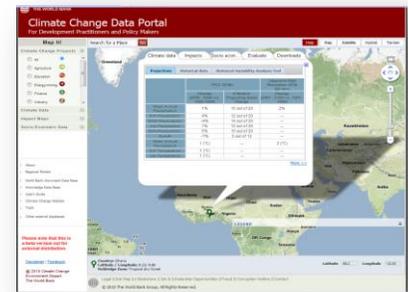
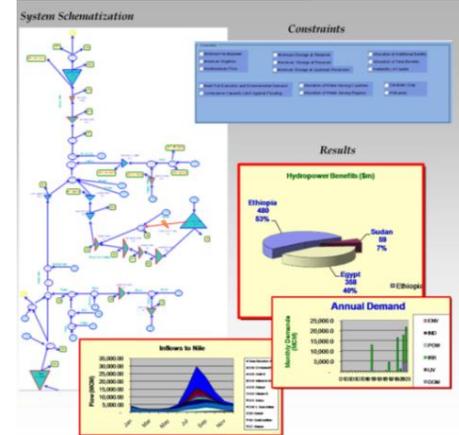
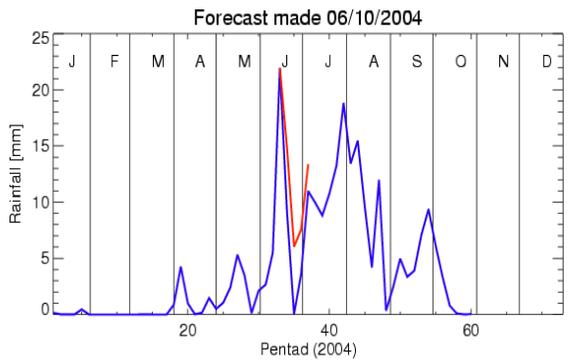
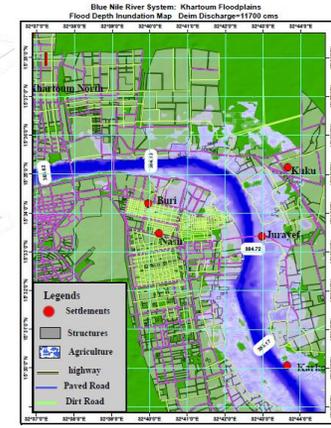
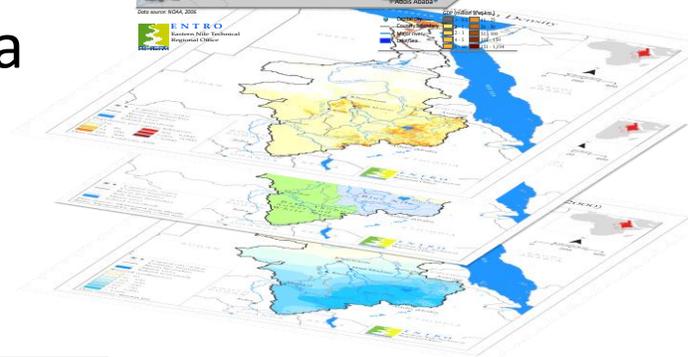
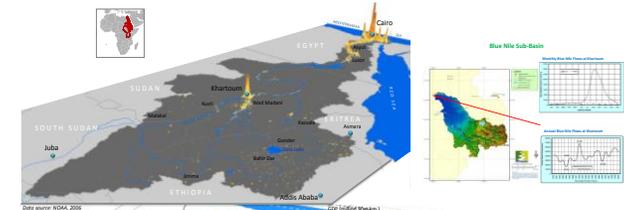
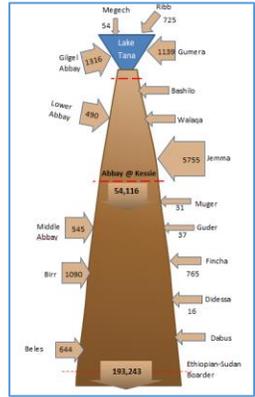
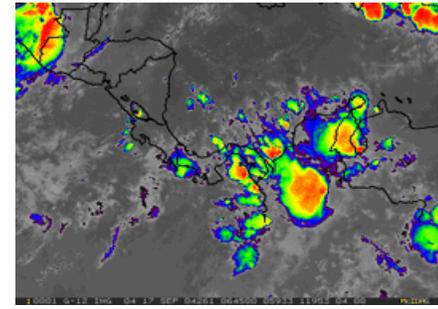


Innovative Solutions in an Integrated Watershed/Basin Perspective...



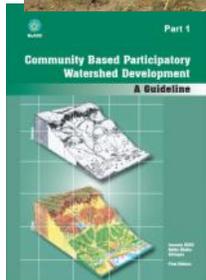
Information & Analysis

- **Resource Information Base** (data rescue; monitoring; comprehensive spatial, temporal and other databases; improved use of satellite data; documents)
- **Knowledge Products/Special Studies** (maps, Atlases, interactive toolkits, surveys)
- **Access and Outreach mechanisms** (publications, web portals, Apps with public access to open data services, technical/ success stories, multi-media documentation)
- **Analytical Tools** (models/Decision Support Systems for planning/operations support in an integrated systems context)



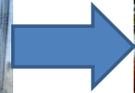
Institutions & Policy

- **Strengthening Institutions** (office modernization, stakeholder participation, capacity development and training incl. distance learning, improved links with academia, internships, visiting experts, professional networks/ communities of practice; forums, competitions)
- **Strengthening Policies** (streamlining institutional design/policy/mandates, improving synergy, economic instruments, decentralization)
- **Innovative Instruments** (e.g. knowledge-driven facilitated diplomacy, policy instruments, incentive frameworks)



Investments & Operations

- **Preparation of robust climate-smart investments** (with adequate attention to technical, environmental, social, economic, and institutional aspects) – upgrading existing infrastructure and building new infrastructure analyzed in a systems context
- **Implementation facilitation, monitoring, and lessons** (adequate technical assistance, ownership, M&E)
- **Water Infrastructure planning and operational coordination**

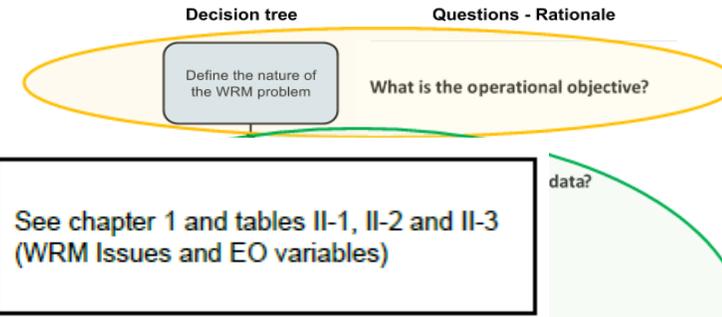


New book "Earth Observation for Water Resources Management"

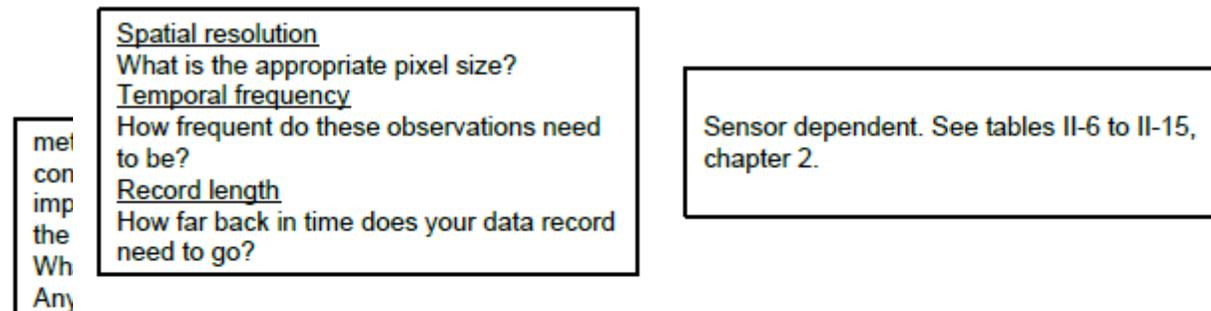
- Overview of **State-of-the-Art** in EO products
- The **publication** provides **guidelines for operational applications** to WRM professionals considering the use of Earth Observation (EO) in their projects
- The focus is on appropriate **questions to ask** once it has been concluded that exploring EO options for the WRM problem at hand is worthwhile
- A flowchart is presented that could be used as a **"road map"** for this purpose.

Decision Tree Guidance Tool at a Glance

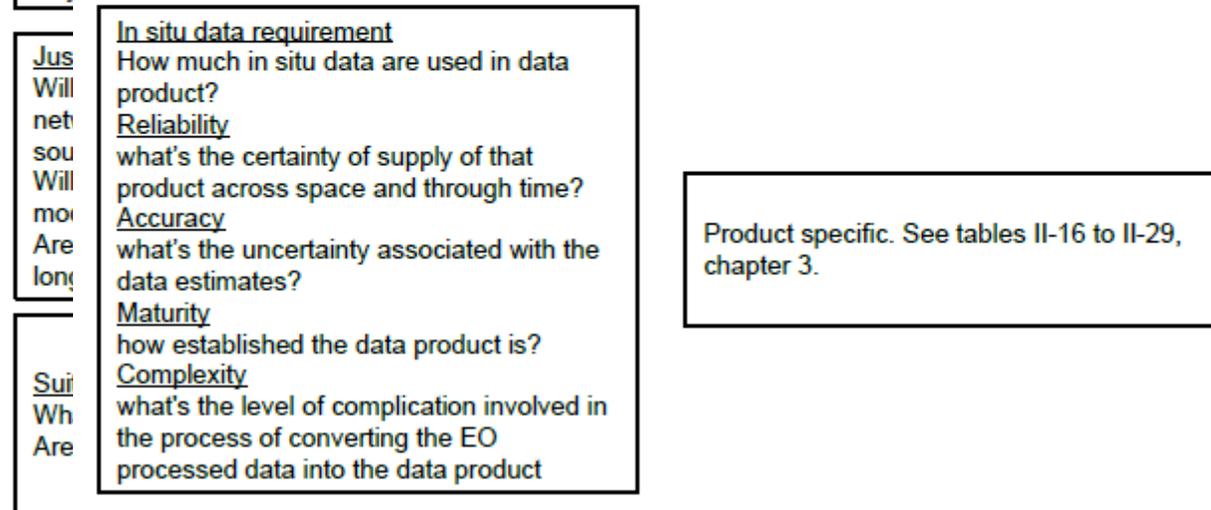
✓ What is the problem to be addressed?



✓ Can RS help?



✓ How can RS help?



Water from Space

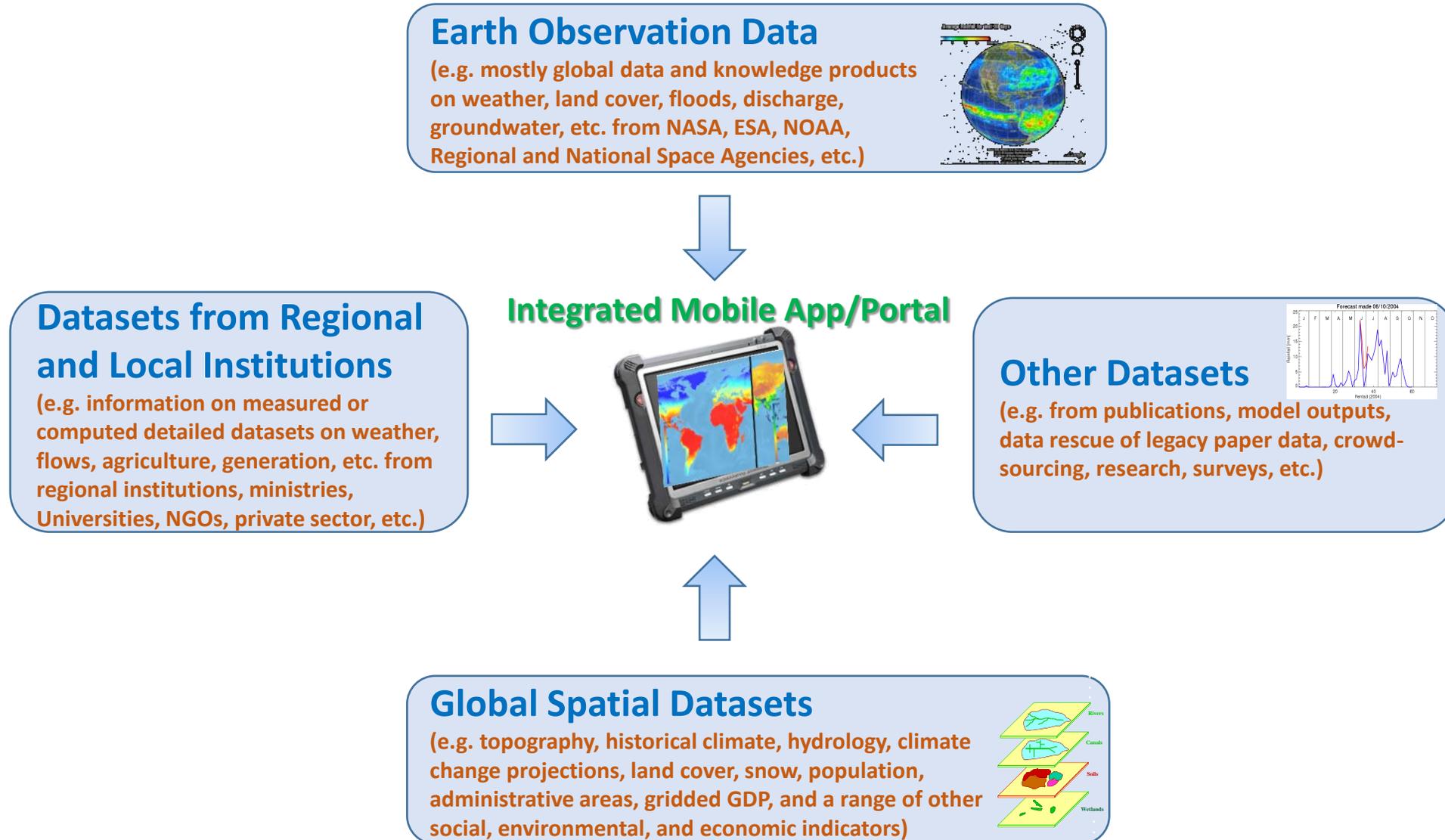
The **second phase** of the *Water from Space* initiative aims to tackle some of the causes why there is still limited use of standardized EO applications in the **developing world** (World Bank clients)

Water from Space can provide support to Bank operational teams that wish to include earth observation technologies like evapotranspiration mapping into their projects but are not sure how to do so

- **Lack of awareness** on importance of essential data/information for robust /scientific decision-making.
- Relatively **few convincing case studies** to illustrate what differences EO could help make at reasonable cost in the water sector, where there is limited data
- **Isolated research** with all sorts of tools while the water agencies need operational applications for their planning and management challenges.
- **Reluctance to pay** from project budgets for RS applications.
- **Burden of processing** much time and effort is used in screening, choice of tools, EO data collection, processing, interpretation and calibrations, and modeling analysis. **This is one of the major hurdles confronting the operational application of RS.**

Open Data Access and Visualization

An Exciting New World Ahead!





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