



Mainstreaming Water Resilience through Earth Observation

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Asia Pacific Water Sector Challenges



Climate change is being primarily felt through water through intensification of the water cycle. The region accounts for 40% of disasters triggered by natural hazards and 84% of the people they affect



Wetlands destruction is driving biodiversity loss. More than 30% of the global biodiversity has been lost because of the degradation of fresh-water ecosystems.



Food security depends on water security. Agriculture consumes an average of 70% of freshwater. Irrigation is the primary driver of groundwater pollution. Growing demand for food will increase pressure on water resources.



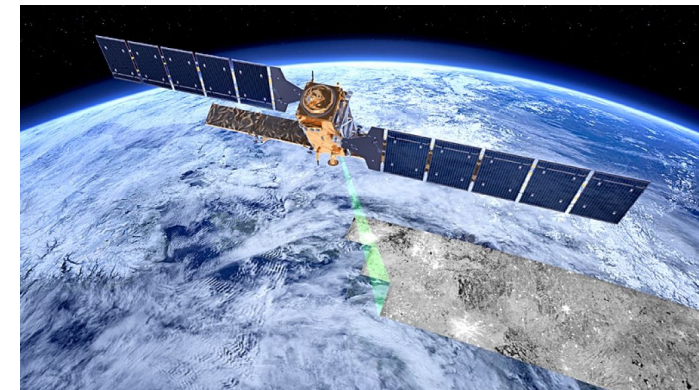
Water quality is deteriorating. 80% of urban wastewater is discharged untreated. Saline intrusion and arsenic are also growing threats to groundwater quality.



Inadequate access to basic water supply and sanitation services. 500 million people without access to basic water supplies, 1.14 billion people without access to sanitation.

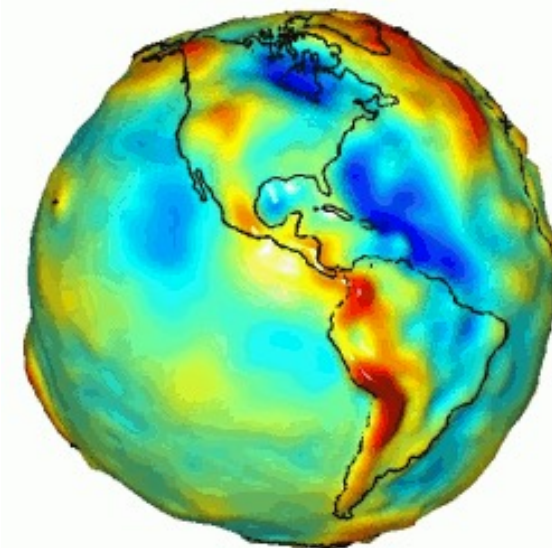
Role of Earth Observation (EO) to Mainstream Resilience

- More and higher accuracy EO data is becoming available
- EO data have global coverage and are collected at a regular time frequency
- Data available at relatively low-cost
- Single datasets are consistent over the entire globe



This enables:

- Data-informed, efficient, and rapid decision making
- Design projects/interventions in different settings incl. remote rural areas or cross boundaries
- Achieving regulatory compliance at low-cost
- Better targeting of investments
- Improving the performance of day-to-day operations



NASA, DLR (“Grace” mission)

Earth Observation for Improving Water Security and Resilience



Challenges and Opportunities for Earth Observation in Water Sector	
Disaster risk management	Disasters impact, post-disaster recovery, coastal erosion management, weather and flood forecasting, cyclone detection and tracking
Areas inundated with water	Flood frequency flood maps Identification of water bodies Intertidal zone Reservoir levels Parametric insurance Emergency assistance
Fluctuation in groundwater levels	Groundwater abstraction/recharge Groundwater flooding, leak detection
Crop productivity and water efficiency	NDVI, NDWI, evaporation, soil moisture, vegetation cover and planning for NbS Water accounting and productivity
Pollution of water bodies	Pollutant plumes
Dam, dikes deformation	Emergency response
Snow and glacial melting	Snow melting detection, glacial protection models
Geodata	Topography and bathymetry

Example: Satellite and Earth Observation Solutions to Water Challenges in India

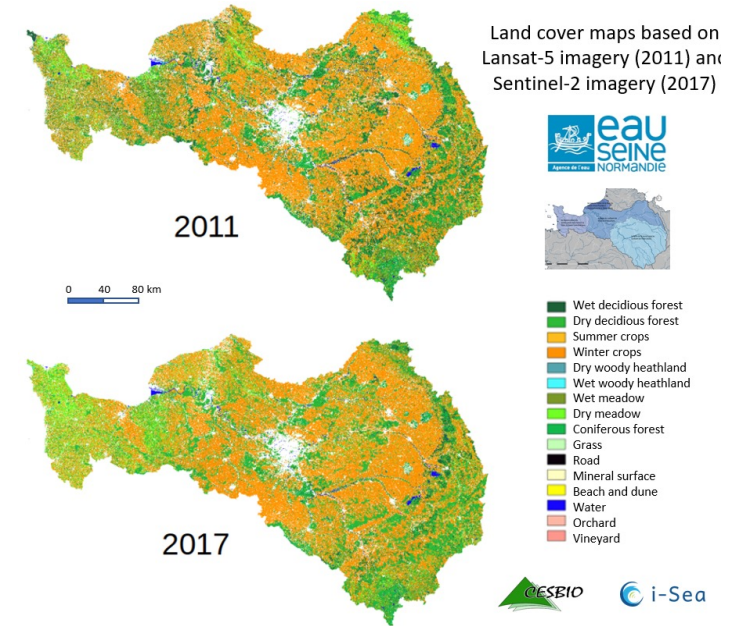
85% of water in India's rural areas comes from groundwater

Risks:

- Groundwater depletion and contamination from arsenic and fluoride
- Flooding and droughts
- Climate change likely to increasingly affect the already critical situation

Solutions:

- Potential water storage and natural reservoirs identified through EO where water can be directed during the monsoon season (NbS solution)
- Flood reduction during the monsoon as well as water supply during dry season
- Water pollution reduction



Harnessing Digitalization and Space Technology for Water Security and Resilience in Asia and the Pacific

Supporting **local water managers** in developing and implementing **digitalization solutions** to foster resilience and improved water security

Examples of **ADB's recent initiatives**:

- **Cluster Technical Assistance** on Mainstreaming Water Resilience in Asia and the Pacific,
- Supporting emerging solution providers and **e-Marketplaces**,
- **Partnerships** with private and public entities, such as JAXA and ESA



The Asia and the Pacific Water Resilience Hub

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