TerraInsight

Transforming water data into climate action and resilient investment

TerraInsight is an integrated water resources management company originating from the Water Resources Research Center of the Disaster Prevention Research Institute, Kyoto University.

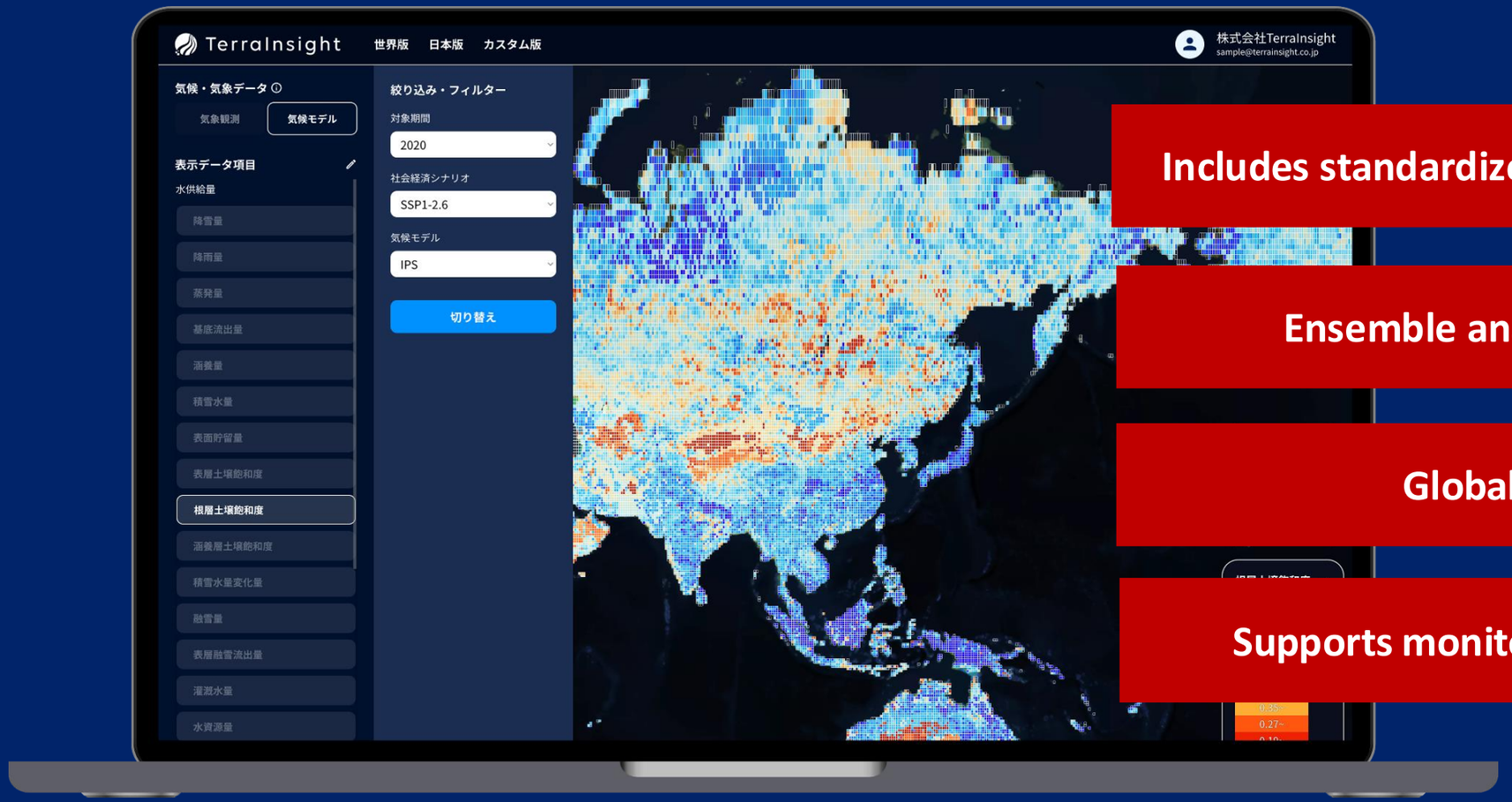


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＜Globally compliant: predictive smart water management resilient to both floods and droughts＞

Integrated Water Resources Management Platform Service

Supports practical decision-making for infrastructure, adaptation, and sustainable development



Includes standardized datasets extending to year 2100

Ensemble analysis using 3 RCPs × 5 GCMs

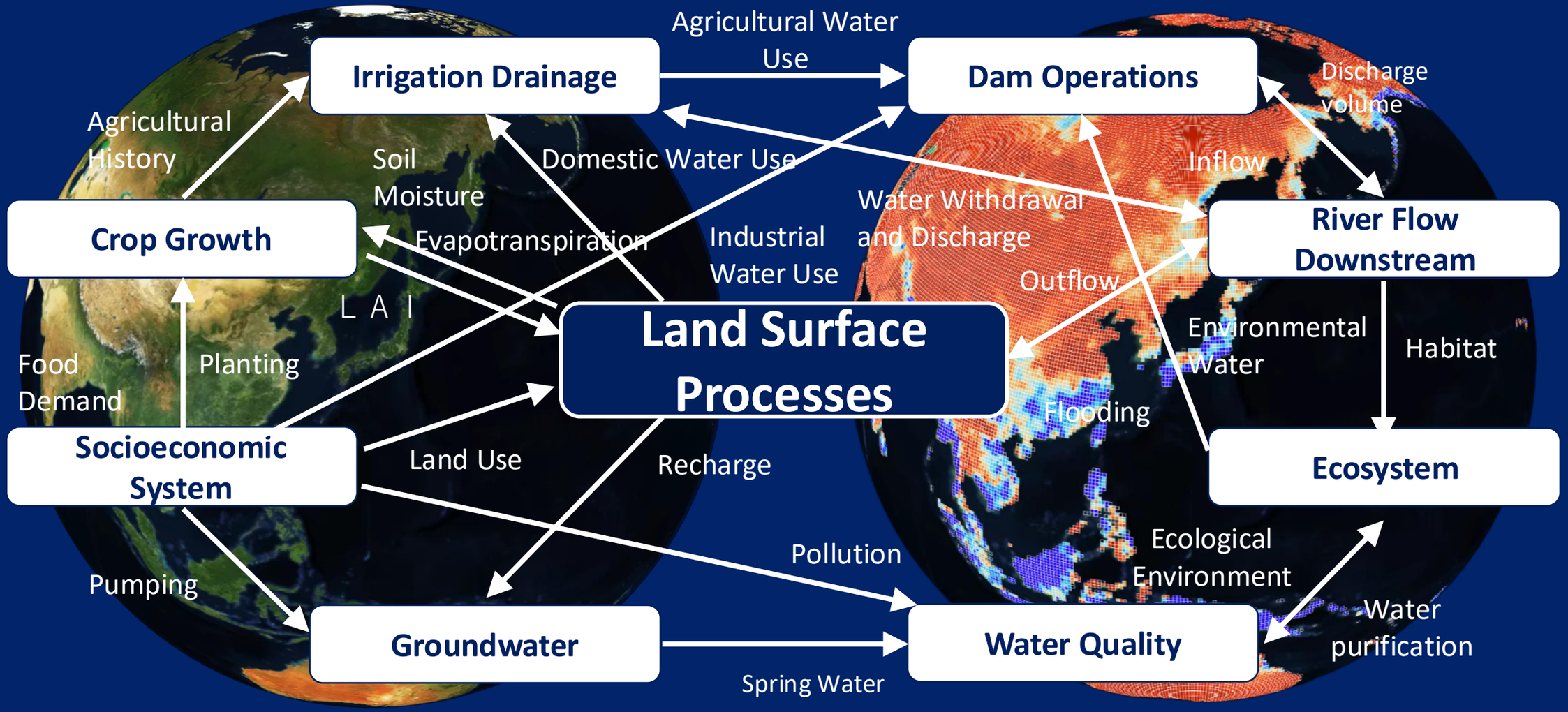
Global-to-local downscaling

Supports monitoring and real-time surveillance

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Advanced Basin-level Digital Twin Analytics

Basin-level digital twin integrating climate, water, land use, agriculture, reservoirs, and human activities



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How Data Is Integrated into the Platform

From global climate data to basin-level decision support for ADB & Partners

Data Inputs

1. Climate projections
2. Reanalysis & weather data
3. Satellite / remote sensing
4. River, reservoir & groundwater data
5. Land use, agriculture & infrastructure
6. Local monitoring & sensor data

Data Processing & Modeling

Basin Digital Twin & Platform Engine



1. Global-to-local downscaling
2. Data assimilation & calibration
3. Basin water balance simulation
4. Flood, drought & water allocation analysis
5. Scenario comparison under climate and socioeconomic change

Decision Support Outputs

1. Water-risk maps
2. Early warning dashboards
3. Infrastructure & investment prioritization
4. Adaptation options by basin, sector & site
5. Evidence for policy, finance & resilient development planning

Actionable even in data-scarce regions by combining global datasets, remote sensing, and available local information.

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Key Application Areas for ADB & Partners

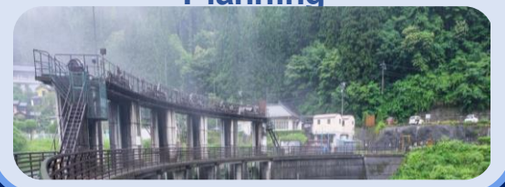
From basin risk visibility to resilient investment and adaptation planning

Aligned with ADB priorities in climate adaptation, water security, DRR, and climate finance readiness

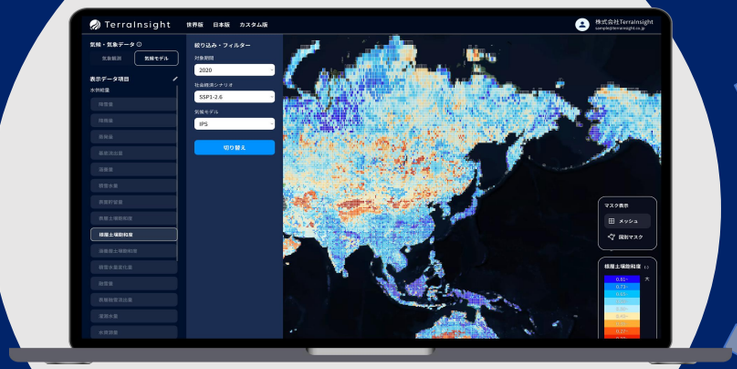
Climate Adaptation



Irrigation and Reservoir Planning



Use Case 2



IWRM Platform Services

Use Case 3

Resilient Water Security



Use Case 1

Food-Energy-Water Nexus



Private Sector Operations



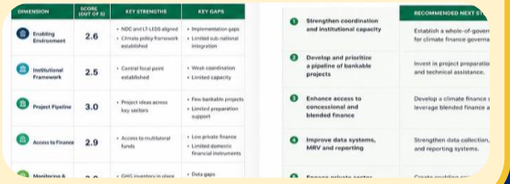
Disaster Risk Reduction



Ecosystem-based Approaches



Climate Finance Readiness



IWRM is not a cost, but an investment in growth and competitiveness

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Use Case 1: Drought Risk Management for Agriculture

A climate-resilient model for water-use efficiency, salinity control, and sustainable farming

1 Development Challenges

- Aral Sea shrinkage from excessive irrigation
- Worsening drought and salinity
- Rising pressure on sustainable agriculture

2 Objective and Background

- Use halophytes in saline environments
- Support farming in marginal areas
- Build a circular smart agriculture model

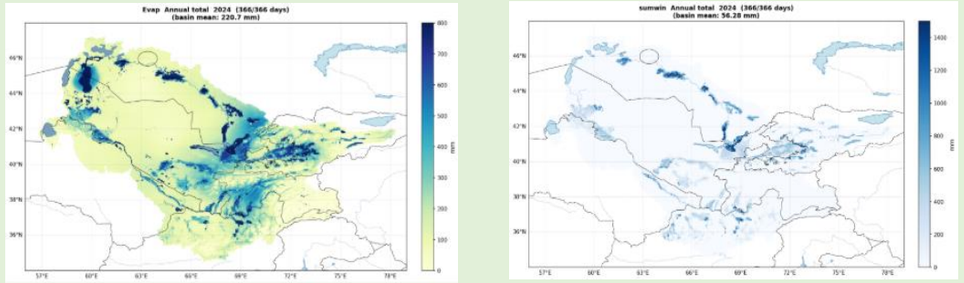
3 Strategic Approach

- Monitor land conditions in near real time
- Analyze water flows from basin to farm
- Support irrigation and cropping decisions
- Integrate water, salinity, and crop management

4 Expected Outcomes

- Higher water-use efficiency
- Reduced salinity damage
- More resilient farming systems
- Scalable application across dry regions

Hydrological Modeling ▶ **Remote Monitoring** ▶ **Utilization of Halophytes** ▶ **Sustainable Agriculture** ▶ **Capacity Building**



Monitoring of land surface variables in the Aral Sea Basin
(Left: Evapotranspiration, Right: Irrigation water requirement)



Experimental site in Karabuga in August 2022



Estimated Economic Benefit	USD 10M/year crop loss	x	10% reduction	=	~USD 1M/year benefit

Use Case 2: Reservoir and Hydropower Operations

Basin-level digital twin for climate-resilient water, energy, and infrastructure management

1 Development Challenges

- Climate change increases inflow uncertainty
- Reservoirs must balance multiple water uses
- Operations affect resilience, revenue, and downstream risk

2 Objective and Background

- Support science-based reservoir operations
- Improve trade-off decisions for storage, release, and generation
- Strengthen resilience to floods, droughts, and seasonal variability

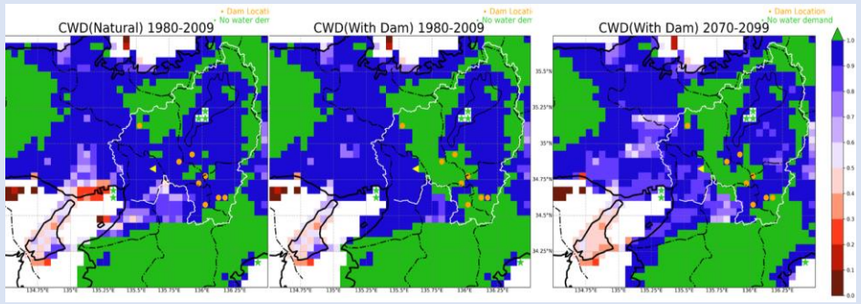
3 Strategic Approach

- Analyze rainfall, inflow, storage, and demand
- Simulate basin water balance and hydropower potential
- Visualize operational scenarios and optimize decisions

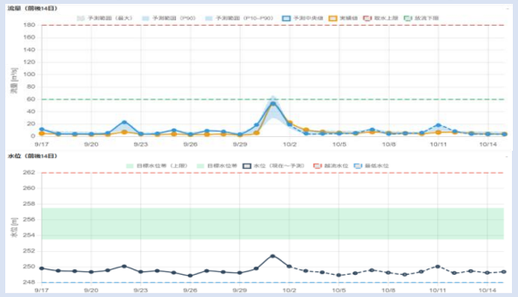
4 Expected Outcomes

- More reliable reservoir operations
- Higher efficiency in hydropower and water allocation
- Reduced flood and drought impacts
- Scalable model for multipurpose dams and basin investment

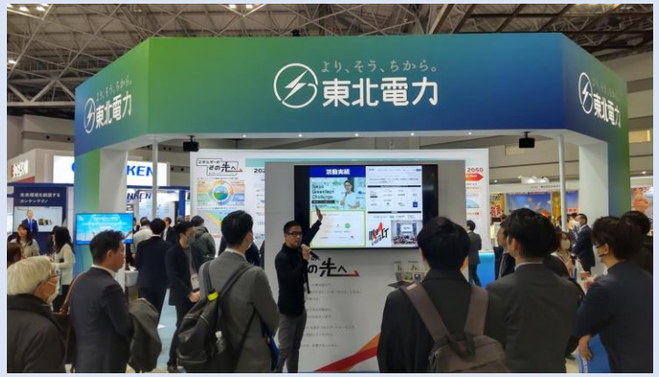
Hydrological Forecasting ▶ **Reservoir Simulation** ▶ **Operation Optimization** ▶ **Hydropower Planning** ▶ **Resilient Infrastructure**



Dam Function Assessment: Yodo River & Lake Biwa Basin
(Left: Natural conditions, Center: Managed operations, Right: Future climate)



Sample Dashboard for Dam Operations
(Upper: Discharge, Lower: Water Level)



Estimated Economic Benefit	USD 20M/year value	x	2% improvement	=	~USD 0.4M/year benefit

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Use Case 3: Industrial Water Security and Business Continuity

Basin-level digital twin for water-risk visibility, operational resilience, and investment decisions

1 Development Challenges

- Water scarcity and floods can disrupt industrial operations
- Factories and industrial parks depend on stable water supply
- Supply interruptions create production losses and business continuity risks

2 Objective and Background

- Strengthen industrial water security under climate uncertainty
- Identify vulnerable sites, water sources, and operational bottlenecks
- Support resilient production, BCP planning, and infrastructure investment

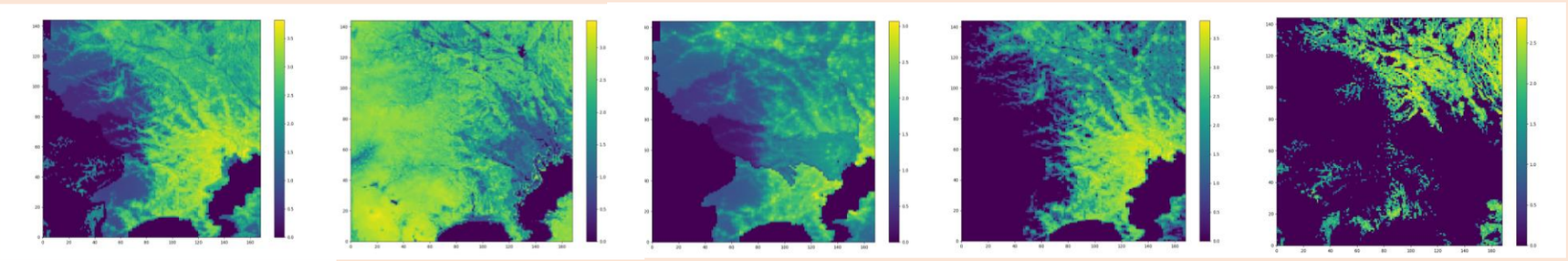
3 Strategic Approach

- Analyze rainfall, river flow, groundwater, intake limits, and industrial demand
- Visualize current and future water risks from basin to facility
- Assess disruption scenarios, alternative sources, and adaptation options
- Prioritize measures based on risk reduction and economic impact

4 Expected Outcomes

- Reduced risk of production stoppage and supply-chain disruption
- Improved water allocation, reuse, storage, and contingency planning
- Clearer investment priorities for water-resilient industrial zones
- Scalable model for manufacturers, utilities, and local governments

Water Risk Screening ▶ **Facility Exposure** ▶ **Continuity Planning** ▶ **Investment Prioritization** ▶ **Resilient Operations**





Water Supply-Demand Balance Assessment in Tokyo (From left: Total Water Demand, Water Production, Industrial Demand, Domestic Demand, Agricultural Demand)

Estimated Economic Benefit	USD 1M/day production loss	x	2 days avoided	=	USD 2M avoided loss

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Common Benefits and Impact

Water as a Growth Strategy in the Age of Climate Change

We translate risk into operational and investment decisions

Nature-based Watershed Digital Twin



- Water resource availability by region
- Seasonal water cycle patterns
- Water production and consumption
- Aquatic ecosystem services

Business Impact Assessment



- Water supply-demand balance
- Flood and drought risks
- Water dependency and exposure
- Water scarcity and water stress

Operational Adaptation Actions



- Operational optimization
- Early warning systems
- Financial impact assessment
- Investment prioritization

Finance Disclosure and Alignment



- TNFD disclosure
- ESG scoring
- Regulatory compliance and accountability
- Sustainable investing

From water-risk information to adaptation action, resilient investment, and measurable value

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Proposed Pilot Project Structure with ADB and Partners

A practical first step toward scalable water resilience in Asia and the Pacific

1



Select a Priority Area

One basin, industrial cluster, or infrastructure project

2



Integrate Available Data

Climate, hydrological, infrastructure, and local data

3



Visualize Risks & Scenarios

Assess flood, drought, and water supply risks

4



Identify Priority Actions

Screen adaptation measures and prioritize investments

5



Build Local Capacity

Stakeholder engagement, training, and practical use

6



Scale Across the Region

Replicable model for Southeast Asia and the wider Asia-Pacific

Typical Pilot Duration: 3–6 Months

- Risk baseline
- Scenario assessment
- Priority adaptations
- Economic value estimate

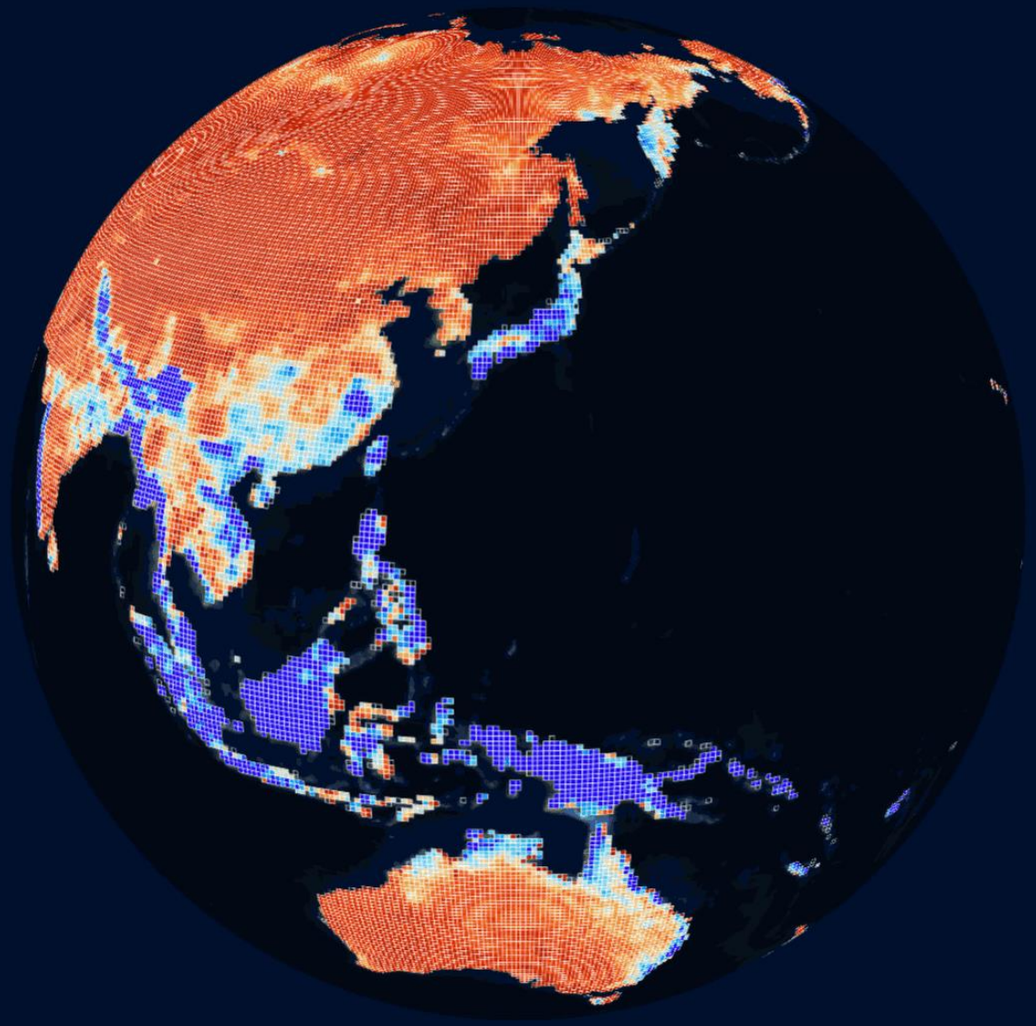
ADB Relevance

- Project preparation
- Investment prioritization
- Climate adaptation planning

A pilot can deliver actionable risk visibility and adaptation priorities within a few months while building a foundation for long-term scale-up.

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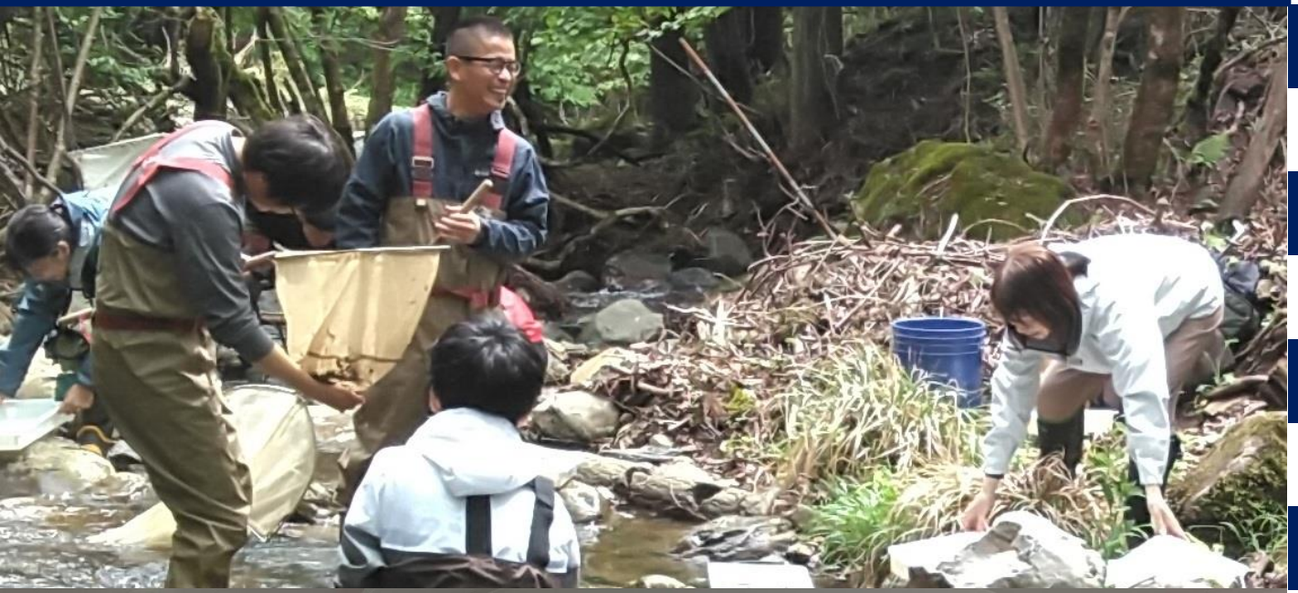
We look forward to collaborating with you.

TerraInsight is ready to work with ADB and its partners to transform water data into climate action, resilient infrastructure, and sustainable development.

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Company Overview

TerraInsight





Company Name

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Date of Establishment

October 1, 2024

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