



Key Activities of the Central Asia Water and Energy Program (CAWEP) to support regional cooperation

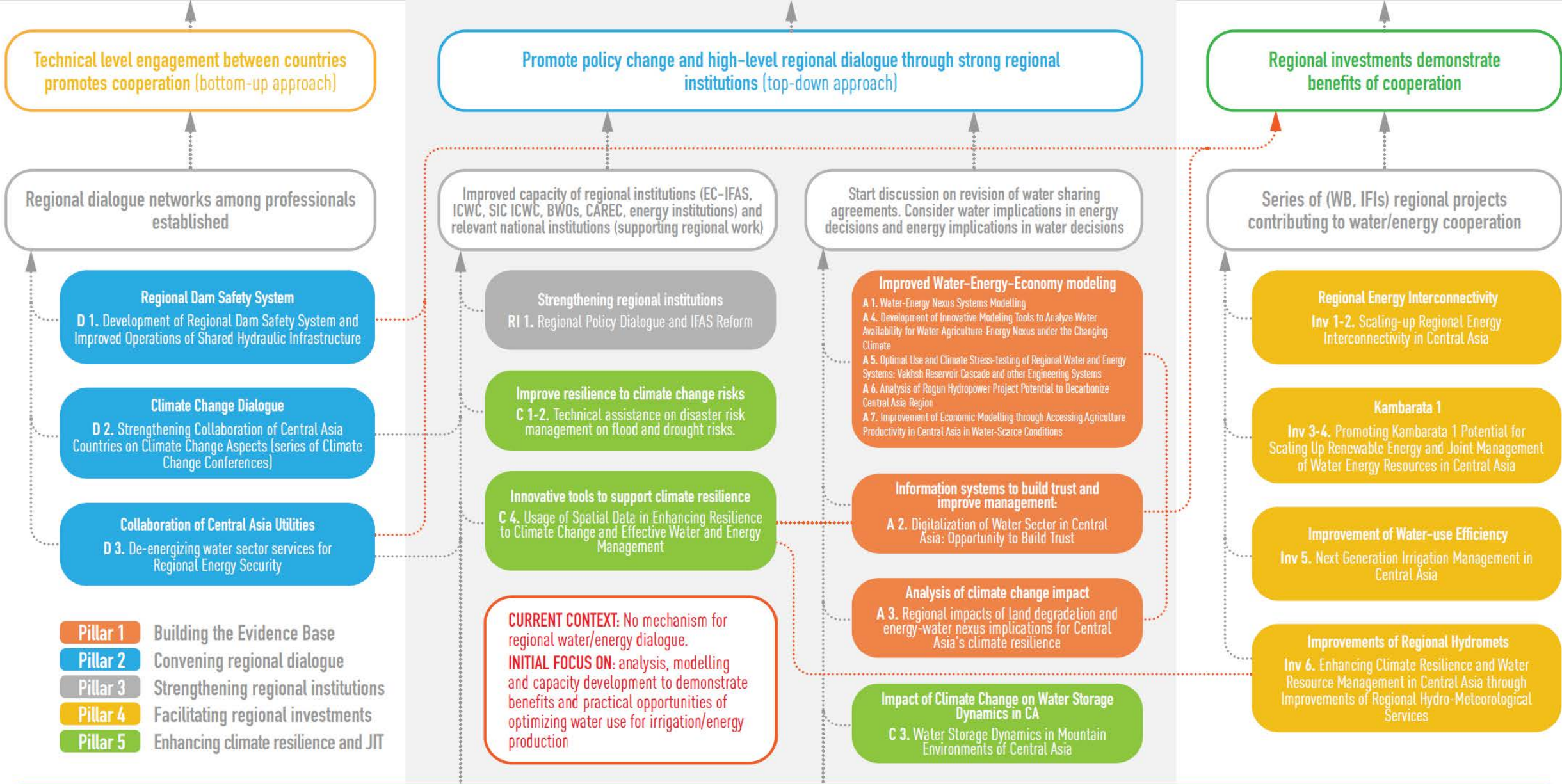
Aleix Serrat Capdevila

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on behalf of the CAWEP-4 team:

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Promote regional cooperation for more resilient and better integrated water and energy management under a changing climate



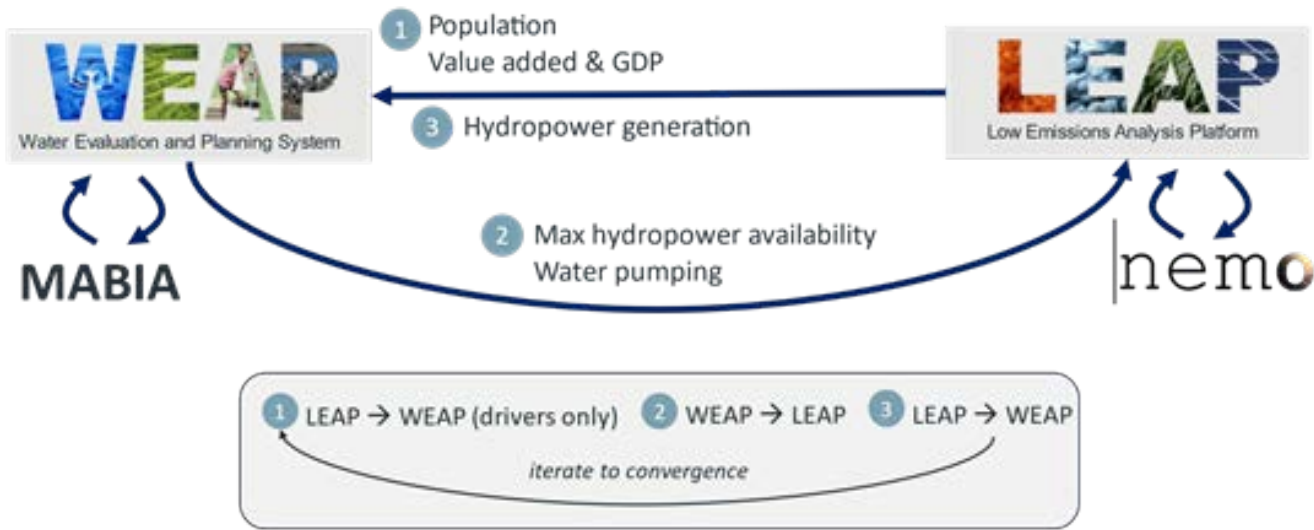
- Pillar 1** Building the Evidence Base
- Pillar 2** Convening regional dialogue
- Pillar 3** Strengthening regional institutions
- Pillar 4** Facilitating regional investments
- Pillar 5** Enhancing climate resilience and JIT

CURRENT CONTEXT: No mechanism for regional water/energy dialogue.
INITIAL FOCUS ON: analysis, modelling and capacity development to demonstrate benefits and practical opportunities of optimizing water use for irrigation/energy production

Just-in-Time Activities
 C 5. JIT activities to support priority needs

1. Water-Energy Regional Modeling Efforts

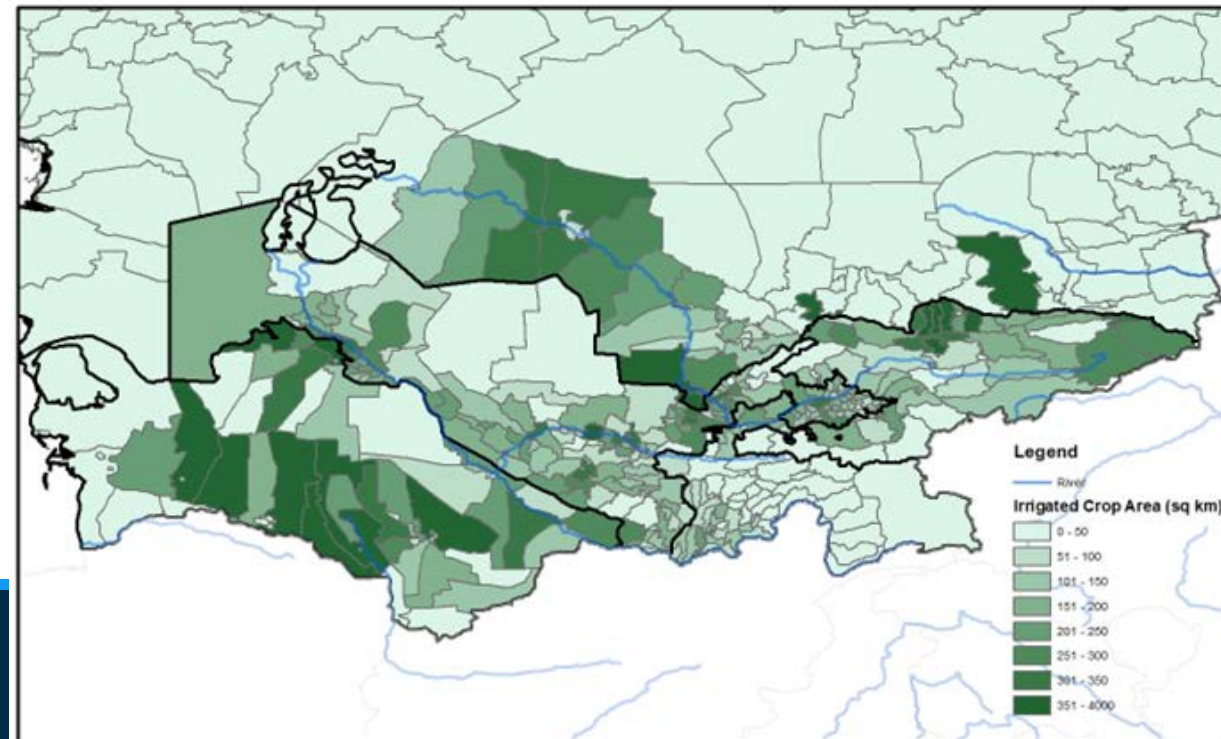
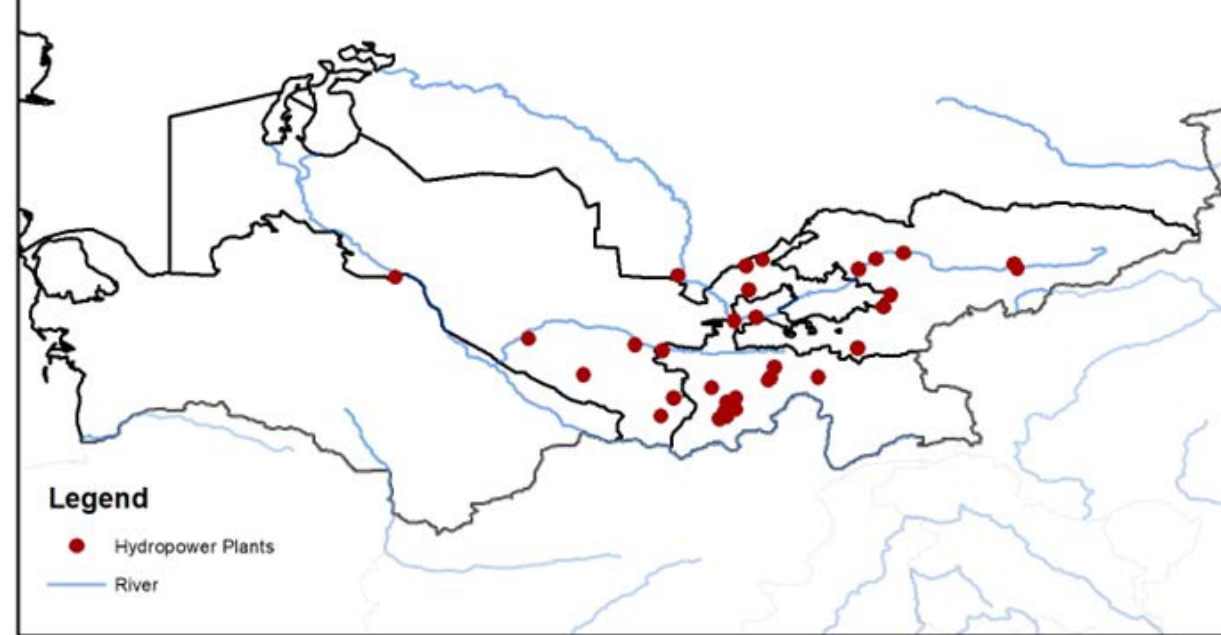
WEAP-LEAP modeling over the Aral Sea Basin

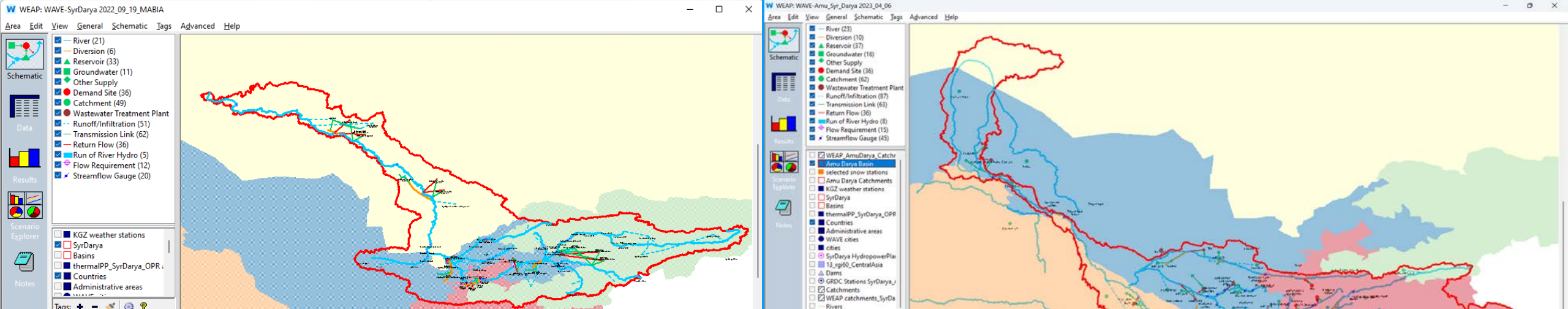


Why are we doing this?

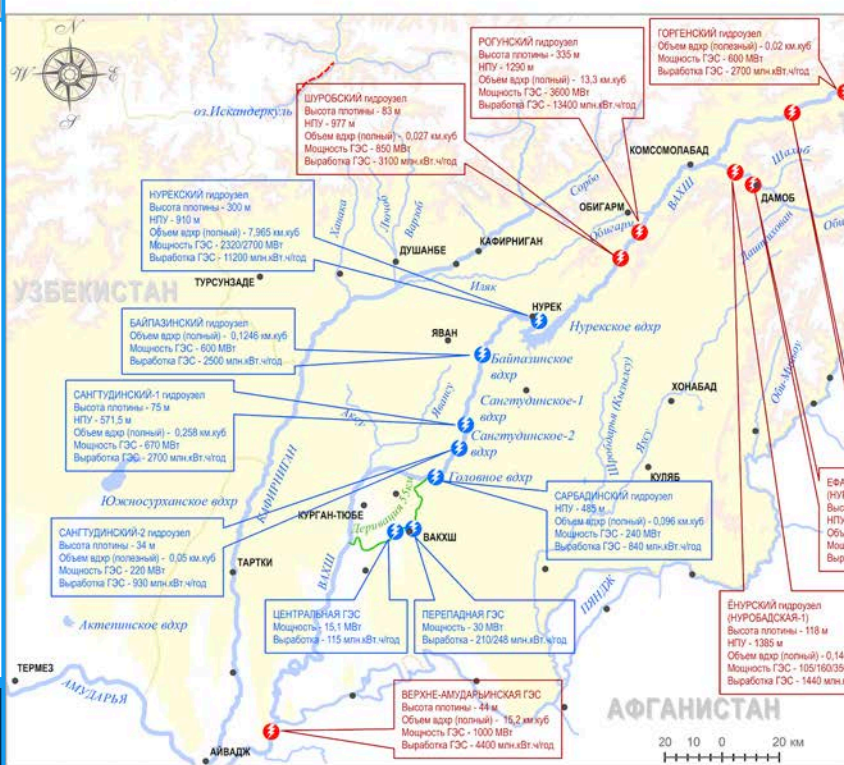
We can model competing demands and tradeoff solutions in the operation of water resources systems:

- Seasonality of Hydropower Production vs Seasonality of Irrigation Water Deliveries
- Costs and Benefits for Upstream and Downstream users (Economic & social)
- Costs and Benefits of potential investments in water & energy





ГИДРОЭНЕРГЕТИЧЕСКИЕ РЕСУРСЫ БАСЕЙНА РЕКИ ВАХШ (ТАДЖИКИСТАН)



ГИДРОЭНЕРГЕТИЧЕСКИЕ РЕСУРСЫ БАСЕЙНА РЕКИ ПЯНДЖ (АФГАНИСТАН, ТАДЖИКИСТАН)



ГИДРОЭНЕРГЕТИЧЕСКИЕ РЕСУРСЫ БАСЕЙНА РЕКИ КАФИРНИГАН (ТАДЖИКИСТАН)



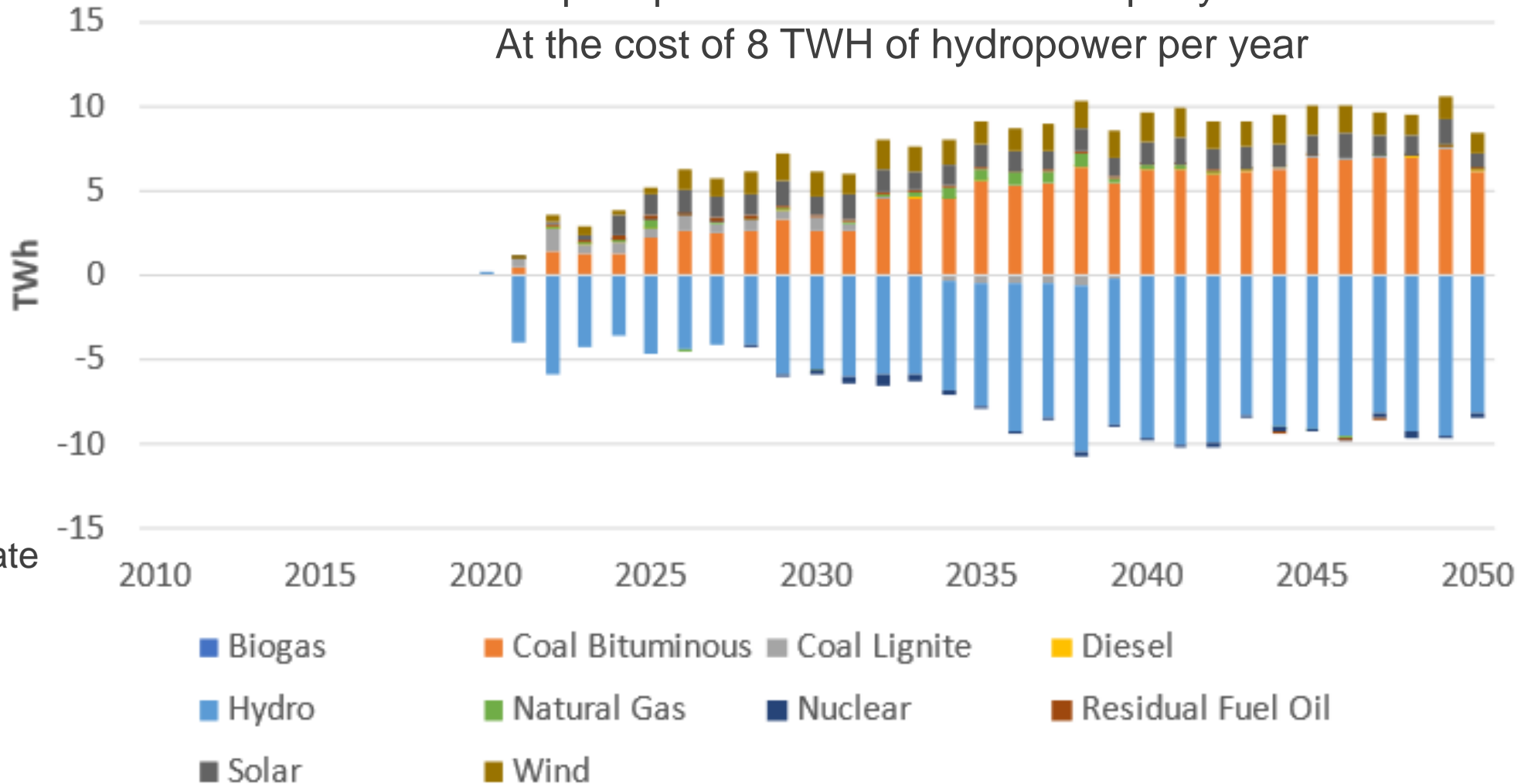
Источники информации:
 1. Схема комплексного использования реки Вахш (<http://www.minenergortom.tj>)
 2. Государственный комитет по инвестициям и управлению гос. имуществом (<http://www.gki.tj/ru/investkarta/otrasl/1/>)
 3. Tajikistan current state and prospective use of hydropower resources.

Источники информации:
 1. Схема комплексного использования реки Пяндж (<http://www.minenergortom.tj>)
 2. База данных МКВК (<http://ecwater.info.net/>)

Источники информации:
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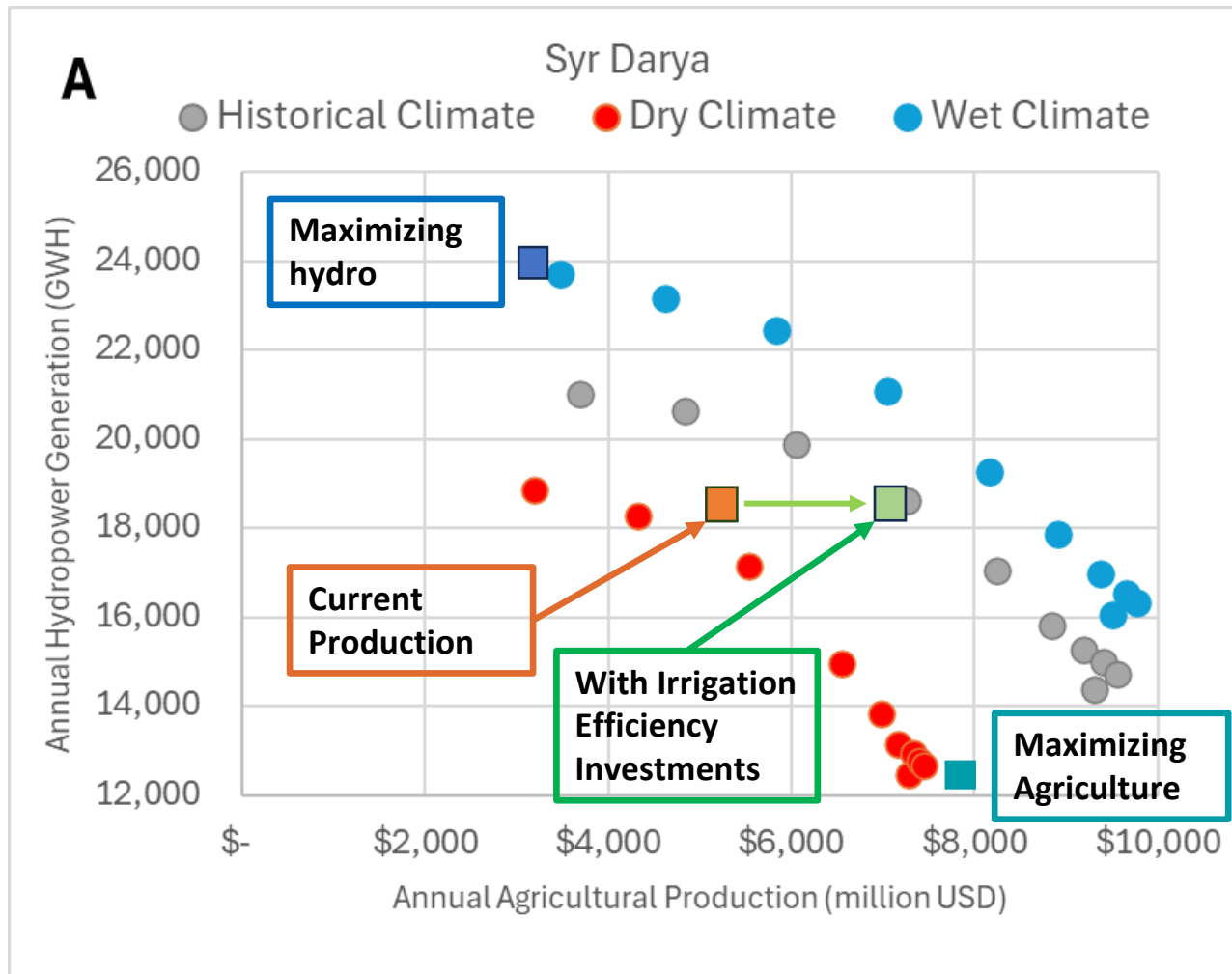
One Hypothetical Scenario: What happens to energy production if we prioritize water for downstream agriculture? (from Scenario Modelling in Aral Sea Basin)

Crop output increase of 4.5M tons per year
At the cost of 8 TWh of hydropower per year



(Average Dry Future Scenario under Climate Change Conditions)

Considering a broad range of Scenarios: → Pareto Frontiers of the Energy–Agriculture Nexus



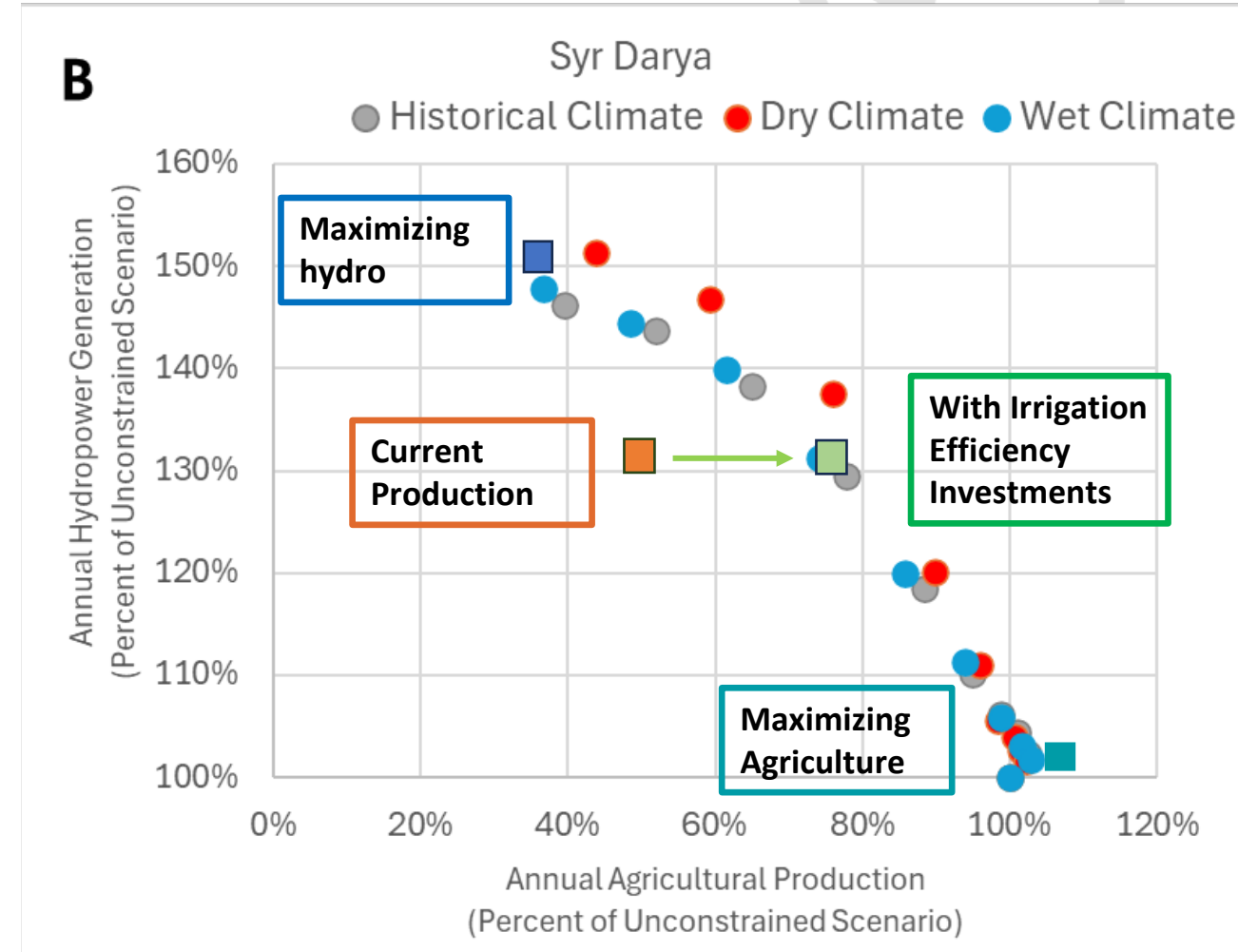
We can simulate a broad range of operations and quantify:

- Economic impacts
- For each country
- For each sector

Pareto Frontiers of Energy – Agriculture Nexus – Normalized (%)

Very significant trade-offs between energy and agriculture.

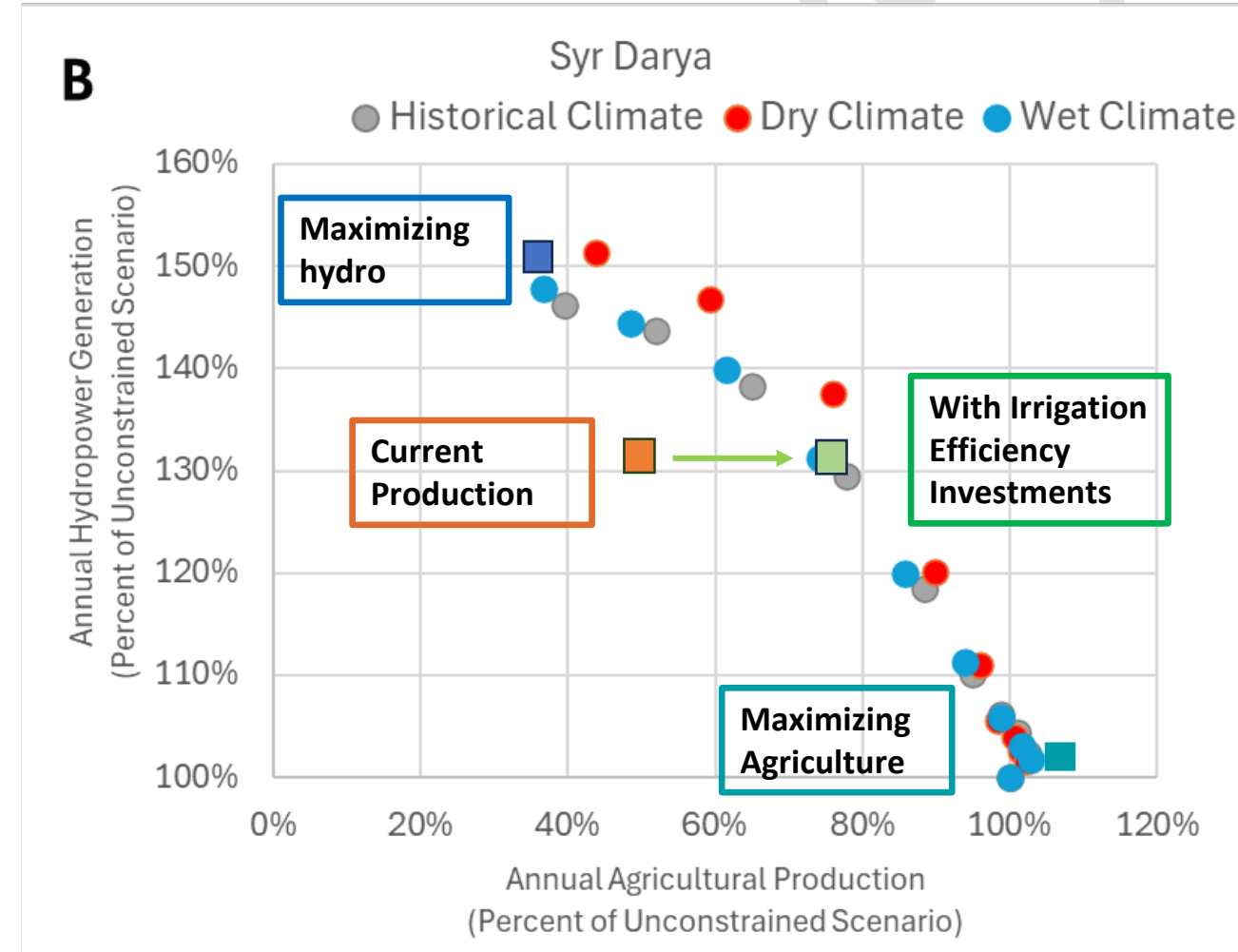
Difficult decisions are ahead, ...lots of regional cooperation needed.



A Regional Water-Energy Model that is Operational

This model is a great tool to:

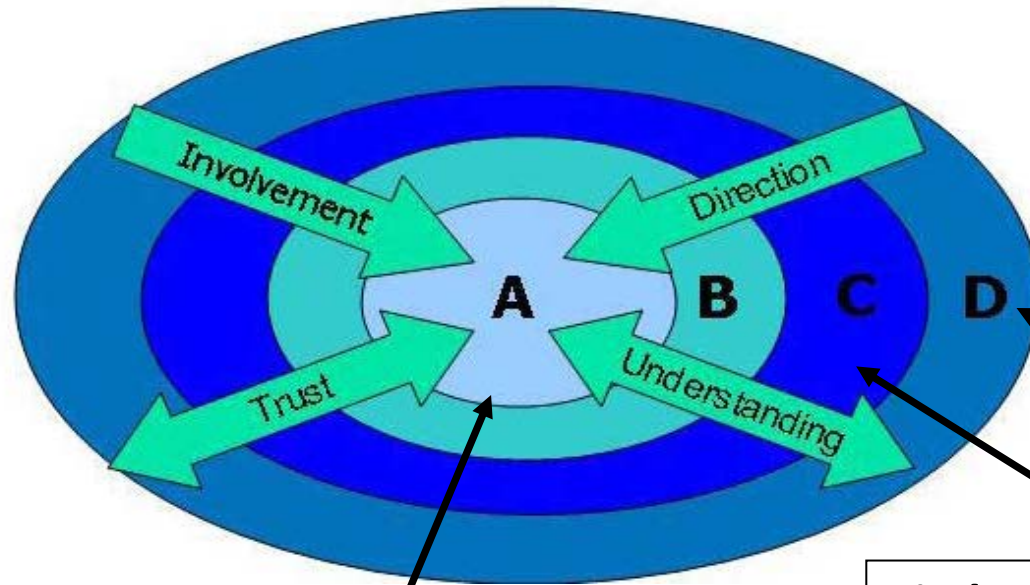
1. objectively evaluate the costs and benefits of *different ways of operating the system*.
2. Evaluate the benefits of future regional investments:
 - Irrigation Efficiency Investments
 - Hydropower Investments
 - Storage Investments
 - Optimized Operations



We need to connect Modeling Efforts with Decision-Makers:

We want to establish a Collaborative Process

Combining modeling efforts with a well structured participation of stakeholders at different levels.



A/B: Core team
Model developers,
SIC-ICWC modelers,
WB support team

Circle D: Country Representatives
advising the decision makers Those who will ultimately decide what is done, what plans are implemented and how.
Meeting 2 or 3 times per year to review, understand and validate progress.
Coordinated with SIC-ICWC & Development Partners

Circle C: Technical specialists from regional and national institutions (BWOs, Dispatch centers, Institutes). Provide guidance and information on the modeling work.
Meeting every 2 months
Coordinated by SIC-ICWC

2 - IRRIGATION MODERNIZATION and WATER CONSERVATION

80-90% of Water is for Irrigation

However, water productivity remains low

Infrastructure more than 50 Years Old

Ageing and inefficient water infrastructure lead to high water losses, poor quality services, and land degradation



Excessively energy-intensive

Expensive (fiscal impacts) and high GHG footprint

Information and institutional bottlenecks capacity constraints hinder water conservation efforts



Environmental Impacts – Low Sustainability of Water Use

A LONG-TERM, TAILORED INVESTMENT PROGRAM FOR WATER EFFICIENCY AND CONSERVATION

- Activities are country-tailored and provide foundation for long-term sustainable water management
- Financing instruments **to be agreed**
- Countries have the **flexibility to select** activities under each pillar

	INFRASTRUCTURE INVESTMENT	FINANCIALLY SUSTAINABLE IRRIGATION SERVICES	INSTITUTIONAL CAPACITY
Country-level activities	<ul style="list-style-type: none"> ➤ Modernization of hydraulic infrastructure/irrigation distribution system and canal lining ➤ Modernization of pumping stations and energy efficiency improvements ➤ Water storage (small seasonal/decade) and modernization of existing dams ➤ Drainage improvement ➤ Groundwater development ➤ Smart water measurement ➤ On-farm water-efficient technologies such as drip, sprinkler discrete irrigation and laser land levelling 	<ul style="list-style-type: none"> ➤ Improve the financial viability of irrigation service providers ➤ Implement energy audits and online monitoring of electricity use at pumping stations. ➤ Introduce digital technologies to support water accounting and metering. ➤ Establish financing and institutional arrangements for sustainable operations and maintenance of dams using needs-based budgeting. 	<ul style="list-style-type: none"> ➤ Capacity-building to access climate finance ➤ Support for national water efficiency policies and cost recovery reforms ➤ Technical capacity building and training, cross-country learning ➤ Reforming institutions to improve dam safety management ➤ Formulation of frameworks for PPP ➤ Shared management of hydraulic infrastructure ➤ Groundwater management, regulation and permitting ➤ Human resources development, salaries, attracting young professionals and gender action plans
Regional-level activities	<ul style="list-style-type: none"> ➤ Networks of irrigation service providers ➤ Standardization of infrastructure designs and practices 	<ul style="list-style-type: none"> ➤ Coordinated efforts to build momentum and access additional financing sources 	<ul style="list-style-type: none"> ➤ Knowledge exchange ➤ Regional extension services

Potential for bringing in concessional financing and grants and other financiers, donors into the program

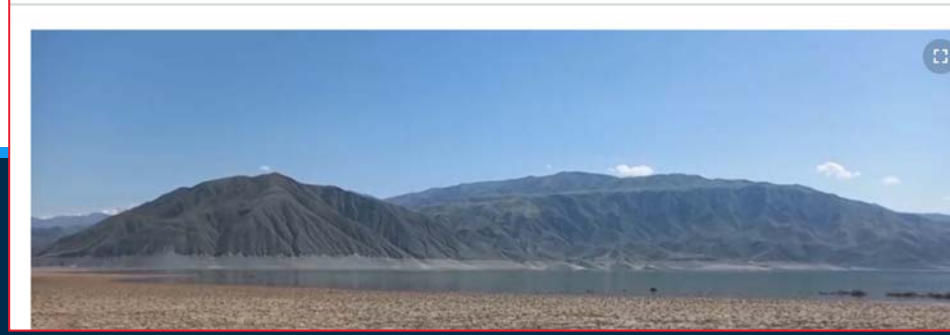


3. Drought Risks and Water Scarcity: How can we reduce national & regional vulnerability?

Activities Planned:

1. **Drought Risk and Resilience Assessment (DRRA)** for each of the 5 countries.
2. **Prioritizing Investments for Drought Resilience (national and regional, transboundary)**
→ Start with Kyrgyzstan and downstream neighbors Uzbekistan and Kazakhstan.
3. **Central Asia Regional Drought Data**

Key results and impact: Road Map of opportunities and actions ahead, List of Prioritized Investments, and Increased Drought Risk Awareness.



Central Asia's shorter winters are whittling away glaciers

Glaciers are disappearing around the world. Here's how it happens in Central Asia.

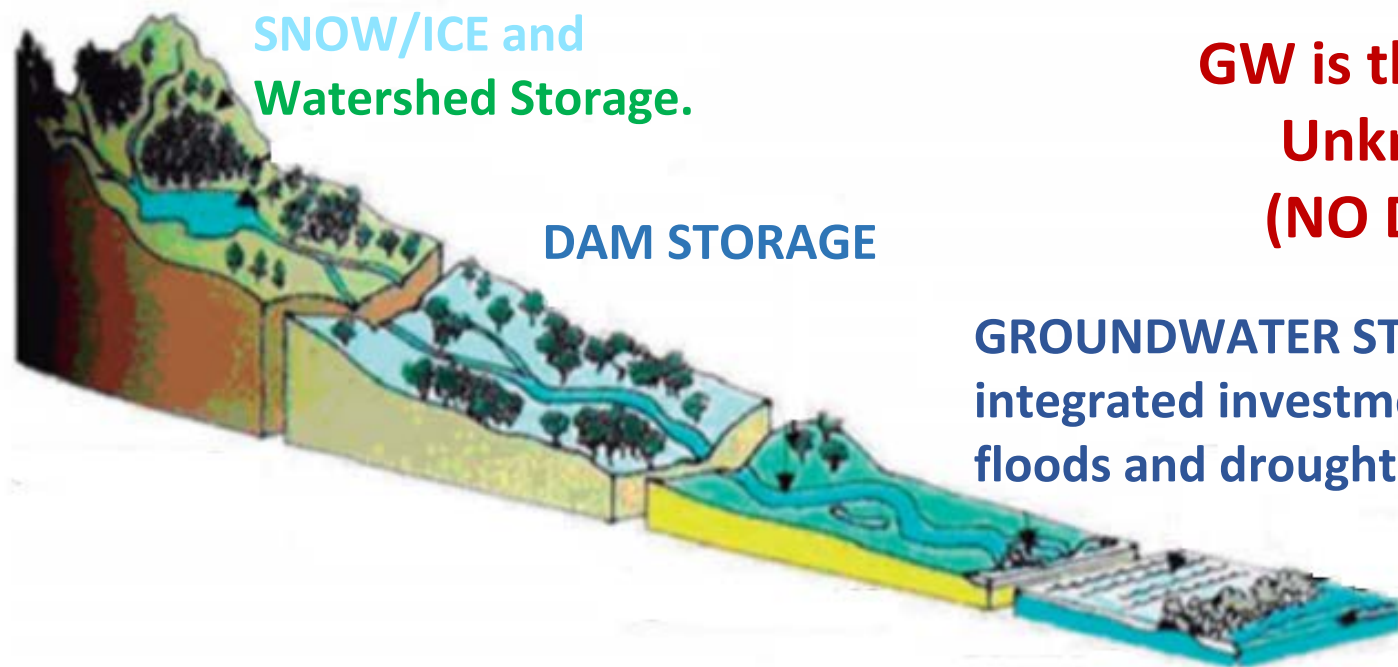
David Trilling Jan 16, 2023



WE ARE LOSING THE WINTER STORAGE. HOW WILL WE MAKE UP FOR IT?

4 – STORAGE AND HOW WE OPERATE IT:

- Integrated Storage Adaptation for Resilience, as climate change will increase irrigation Demand and reduce water Availability
- SW + GW

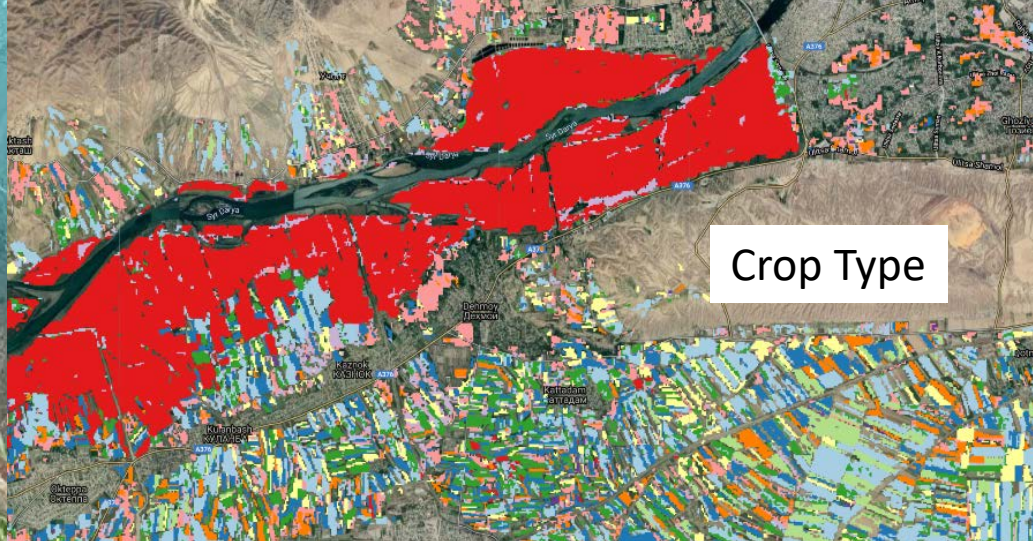
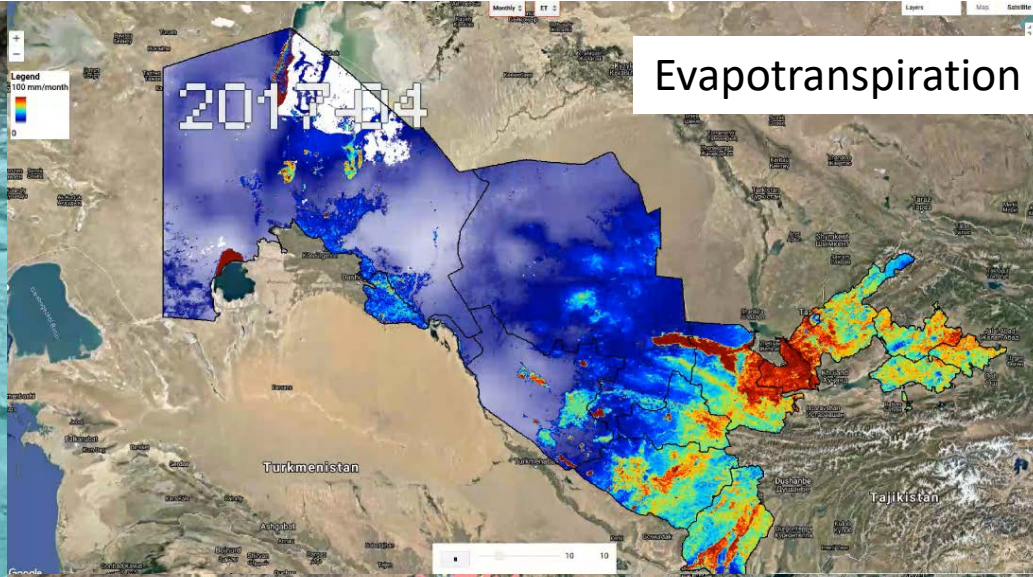


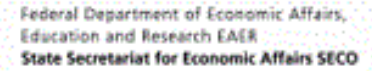
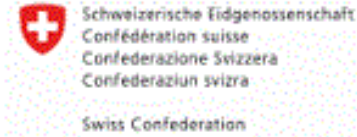
GW is the Great Unknown (NO DATA)

GROUNDWATER STORAGE integrated investments for floods and droughts

5 - DIGITAL AGENDA: WATER ACCOUNTING: Data and Monitoring

- Digitalization: Modernizing Water Centers – Unified Water Management Information Systems
- Remote Sensing data & In-situ data sharing
- Should be a requirement for all big investments – Monitoring & Data Sharing





Thank you

CAWEP

CENTRAL ASIA WATER & ENERGY PROGRAM