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GLOBAL LEARNING AND EVIDENCE EXCHANGE  
**CLIMATE-SMART AGRICULTURE**

DECEMBER 5–9, 2016 // SIEM REAP, CAMBODIA

# Irrigation and Agricultural Water: Challenges and Opportunities for Tajikistan

Mark Doyle, USAID/Tajikistan



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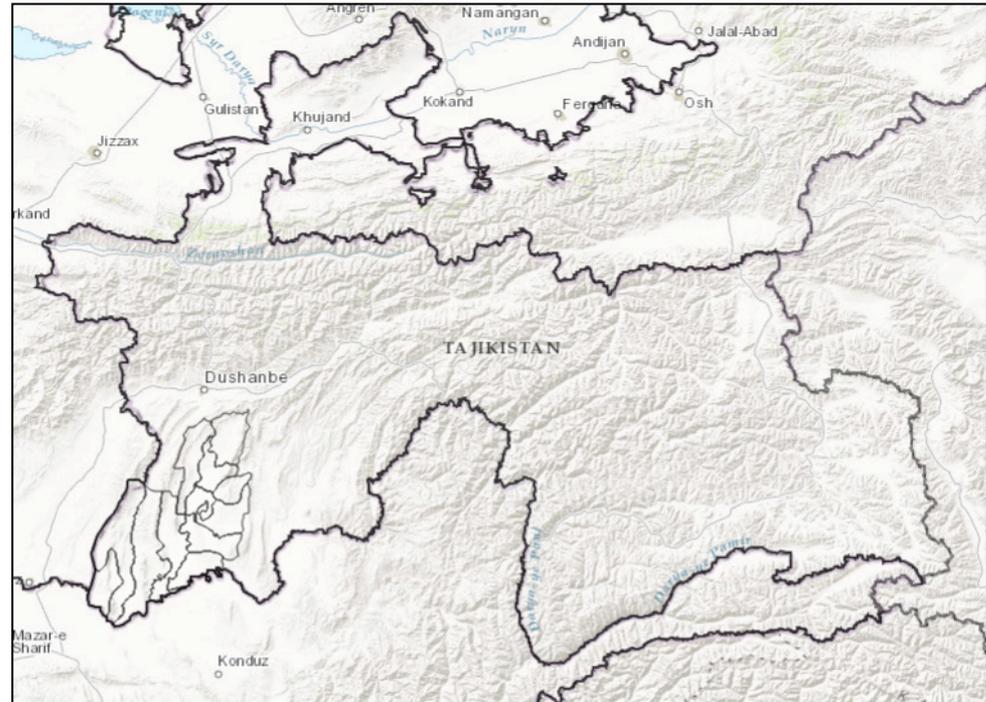


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## TAJIKISTAN

- Population: 8.6M and growing
- Agriculture employs 75% of the population
- Major crops: cotton, wheat
- Feed the Future value chains: vegetables, orchards, dairy
- Ample water but mountainous: 7% arable land



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## CENTRAL ASIA RIVER BASINS

- Two Rivers: Amu Darya and Syr Darya
- The Amu Darya river provides the majority water of for Tajikistan and northern Afghanistan
- Rivers are critical for irrigation and hydropower





## CLIMATE CHANGE VULNERABILITY: TAJIKISTAN

- Droughts are predicted to be more frequent and intense—especially in the ZOI—as a result of higher temperatures
- Water flow is expected to change over time, quantitatively and temporally, with the melting of glaciers and changes in the degree and timing of snow fall and snow melt



Photo: Aga Khan Foundation





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## WATER MANAGEMENT: TAJIKISTAN

- Soviet Era: Construction of irrigation schemes. Creation of collective farms. High government support.
- 1991: Soviet Union collapsed ending subsidies for agriculture / irrigation.
- 1997-present: Land reform process. Break up of collective farms and restructuring of water management.
- Top down and grassroots approaches.



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## USAID AND WATER USER ASSOCIATIONS

### Establishment and Strengthening of Water User Associations (WUAs)

#### Institutional Development:

- 60 WUAs created by USAID using hydrological boundaries
- WUAs registered with the Government

#### Infrastructure Improvements:

- 49 WUA offices built
- 1261 Water gates installed/refurbished
- 64 km irrigation canals cleaned
- 160 km drainage ditches cleaned
- Heavy equipment purchased





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## USAID AND WATER USER ASSOCIATIONS

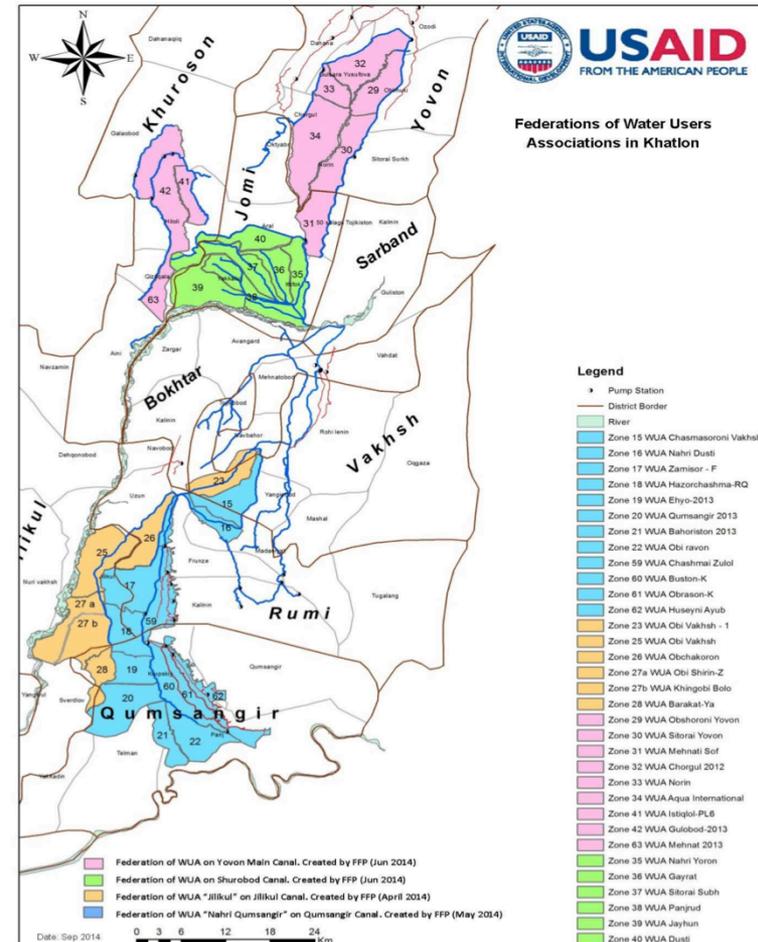
Current work focuses on capacity building, but challenges remain

### Capacity Building:

- Needs assessments / training
- Organizational management
- Fee collection / fundraising

### Challenges:

- Lack of funding
- Urbanization / other water uses
- Maintaining infrastructure
- Soil salinization
- Changing agricultural landscape



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## FEED THE FUTURE TAJIKISTAN OTHER AWM ACTIVITIES / TECHNOLOGIES:



Drip irrigation



Plastic mulch



Improved greenhouses



Improved varieties



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# Irrigation and Agricultural Water Management Challenges and Management Needs in Afghanistan

Shamim Niazi, Project Management Specialist, USAID/Afghanistan



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## CONTEXT

- Agriculture is the single most important sector of the Afghan economy
- Climate change: high-impact and low response
- Decreasing water availability
- Agriculture in Afghanistan is undergoing a significant transformation



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## NATURAL CHALLENGES

- Arid climate
- 40-45% of the country is rangeland
- 30-40% is mountains that are water towers of the country
- Water availability from aquifers is declining
- Afghanistan is not a water-scarce country, but the water is not uniformly distributed
- Natural Disasters (flood, drought, landslides)
- Poverty





## RAMIFICATIONS OF CONFLICTS

- Irrigation systems have deteriorated significantly as a result of conflict
- Afghanistan: 3.1 million hectares reduced to about 1.7 million hectares
- The average land per person: 1.5 ha as compared to 3 ha in 1960s
- Forests have declined from 4% of the total surface area to 2.63% (1.7 million ha)
- Outmoded agricultural practices and lack of inputs
- Approximately 33% of Afghans are food insecure
- Influx of refugees has had a significant impact





## CLIMATE CHANGE IMPACTS

- Mean annual temperature has increased by  $0.6^{\circ}\text{C}$  since 1960, which translates to an average increase of  $0.13^{\circ}\text{C}$  per decade
- Precipitation has decreased by 2% per decade
- Snow cover is reduced
- 33% of the total pasture and agricultural land area in the country has been degraded
- Frequent droughts and floods





## INSTITUTIONAL CHALLENGES

- Climate change is not a priority in the country
- General level of awareness on climate change in Afghanistan is low
- Afghanistan does not have a platform for coordinated action on climate change adaptation
- Inadequate financing
- Institutional arrangements for water resource management
- Lack of reliable data
- Lack of capacity





## WHAT IS THE GOVERNMENT DOING?

- Bringing 2.26 million ha of land under improved irrigation
- Establishing community associations to sustain the investment
- Shifting from institutional view to farmer-centric view
- Establishing agricultural research institutions
- Soil conservation
- Food grains management
- Climate-sensitive natural resource management



# CLIMATE-SMART AGRICULTURE

- Climate-smart agriculture is a new area
- Major interventions are land leveling, tillage, crop rotation, soil cover and water-saving technologies
- USAID developed a smartphone app applying remote sensing of land use and crop production.
- USAID introduced Purdue Improved Crop Storage (PICS) bags
- USAID introduced the use of plastic mulch
- USAID-trained extension agents on conservation agriculture and demonstrated planting in rows and minimal tillage practices.

Category	Legislation, Policies and Plans pertaining to climate change adaptation
Overarching Policies	<ul style="list-style-type: none"> <li>• Afghanistan National Development Strategy (ANDS)</li> </ul>
Water Security and Safety	<ul style="list-style-type: none"> <li>• Water Law</li> </ul>
Food Security	<ul style="list-style-type: none"> <li>• Food Security Act (under development)</li> <li>• NPPs in the Food Security and Agriculture Cluster</li> </ul>
Biodiversity*	<ul style="list-style-type: none"> <li>• National Biodiversity Strategy and Action Plans</li> </ul>
Disaster Risk Management	<ul style="list-style-type: none"> <li>• Afghanistan Disaster Management Law</li> <li>• Afghanistan Disaster Management Plan</li> <li>• Disaster Management Strategy and Mitigation Policy</li> <li>• Disaster Management Framework</li> <li>• Strategic National Action Plan on Disaster Management</li> <li>• Sectoral &amp; Provincial Disaster Management Plans</li> </ul>
Land Degradation*	<ul style="list-style-type: none"> <li>• NPP: Natural Resource Management and Development</li> </ul>
Human Health	<ul style="list-style-type: none"> <li>• NPP: Health for All Afghans</li> <li>• National Renewable Energy Policy (under development)</li> </ul>
Energy Access	<ul style="list-style-type: none"> <li>• National Power Sector Master Plan</li> <li>• National Energy Policy</li> <li>• National Renewable Energy Policy (under development)</li> <li>• National Energy Efficiency Policy (under development)</li> </ul>



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## USAID AND CLIMATE CHANGE

USAID/OAG office has 18 active projects. The following focus on irrigation, natural resource management, and climate change and water data management:

- Strengthening Watershed and Irrigation Management (SWIM): Support stable, agriculture-led economic growth by increasing the sustainable and productive use of water and improve water resource management
- Rehabilitation of Afghanistan Irrigation Networks: Increase crop productivity by expanding development and improving management of approximately 25,000 ha of irrigated agriculture land
- Kandahar Food Zone (KFZ): Rehabilitation of Irrigation Infrastructure and Improved Irrigation System Management
- SERVIR HKH project: Establish a water data management unit



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## MAJOR TAKEAWAYS

- **More sophisticated understanding of the links**
- The greatest loss to human life and economic damage over the last few decades has not been because of terrorism but because of natural disasters from floods, seasonal water shortages and drought
- Strong commitment of the international community
- Climate-smart agriculture is a new area that needs more support





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## THANK YOU

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"Kabul can be without gold, but not without snow" Afghan proverb



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