

## Water users' cooperation as adaptation to water scarcity: Cases from irrigated areas of Kazakhstan and Uzbekistan

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- Anticipatory (planned) & reactive (autonomous) adaptation
  - Planned adaptation requires government intervention
  - Autonomous adaptation occurs through private agents
- *Ex post* strategies: to regulate responsibility and compensation when damage happens)
  - food harvesting, reduction in food intake, livestock selling, temporary migration, seeking aid assistance, planting changes, new crop varieties, off-farm work
- *Ex ante* strategies: to prevent or hinder climate damage
  - farmers' cooperation, food reserve/storage, extension services, income diversification, crop insurance, pricing reform, improved weather forecasting, dissemination of drought-related early warning information, adoption of new technologies

(Jones and Boyd, 2011; IPCC, 2001)

- Situations when individual interests are at odds with group interest
  - individuals free ride, but a community (as a whole) is better off when everyone contributes - **Common-pool resources**: Water use (mostly asymmetric) & Infrastructure creation ([Ostrom et al., 1994](#); [Janssen & Ostrom, 2006](#))
- Real-world problems are **hybrid social dilemmas** ([McCarter et al. 2011](#)):
  - Water users are required to make active contributions (comply to service fees) and avoid from over-consumption of water (comply to agreed schedules)
- Combination of:
  - Social fences or "**give some dilemmas**": Contributions to infrastructure maintenance
  - Social traps or "**take some dilemmas**": Compliance to agreed rules and collective decision of water distribution

# Why water users' cooperation matters? in Central Asian context

- Land reform & fragmentation of water users -> problems of 'smallness'
  - Difficulties with access to resources, machinery, credits, markets and high costs of resource use coordination (Lerman, 2009)
- Decentralization in water management, decentralization of producers' decision-making
  - Water Users' Association (WUAs) – IWRM's decentralization tool: **no success** (Zinzani, 2015)
- To solve the problem of smallness and poor coordination -> voluntarily **informal cooperation** among water users, e.g. *hashar* (O'Hara, 2000)
  - As a reactive autonomous adaptation to collectively cope during water-stressed years



## Long- and short-term determinants of water user cooperation: Experimental evidence from Central Asia (Amirova et al., 2019)

- **History does not predetermine** the success of current water decentralization in ancient (Samarkand) VS relatively recently established (Turkistan) irrigation sites
- **External regulation** decreases farmers' cooperation in water management
  - Efficiency of top-down approach is questionable
- **Face-to-face communication** increases farmers' cooperation in water management
  - Truly self-governed water management policies can be viable
- Substantial **heterogeneity** across locations (villages) warns that one-size-fits-all approaches to local cooperation are unlikely to succeed

*Q: What is the content of  
cooperation among water users?*

# Study sites in Kazakhstan and Uzbekistan

AGRICHANGE – Institutional change in land and labour relations of Central Asia’s irrigated agriculture [www.iamo.de/en/agrichange](http://www.iamo.de/en/agrichange)

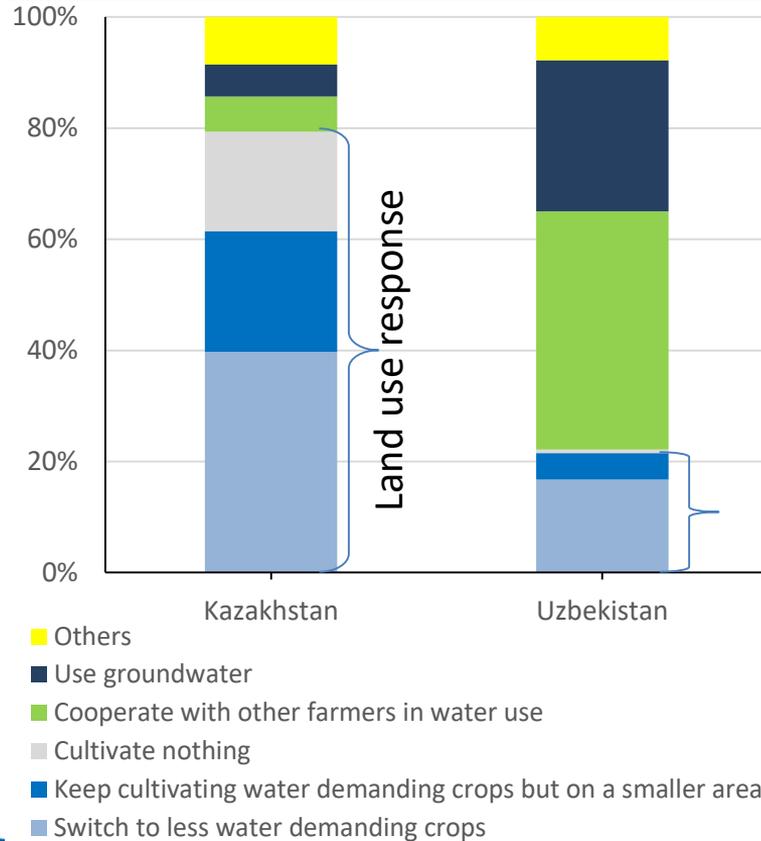
SUSADICA – Structured doctoral programme on Sustainable Agricultural Development in Central Asia [www.iamo.de/susadica](http://www.iamo.de/susadica)



Contrasting agricultural institutional settings, e.g.:

- Decision making autonomy

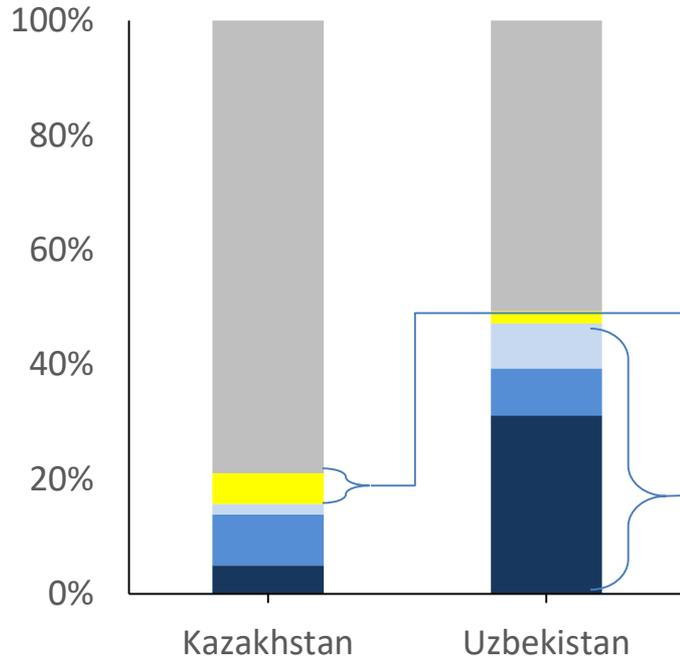
# Farmers' responses in water-scarce years



In Kazakhstan, farmers respond with land use adjustments (more decision freedom)

In Uzbekistan (less autonomy in decision-making), farmers rely on peer-cooperation & ground water

# Observed cooperation in “give some” water management

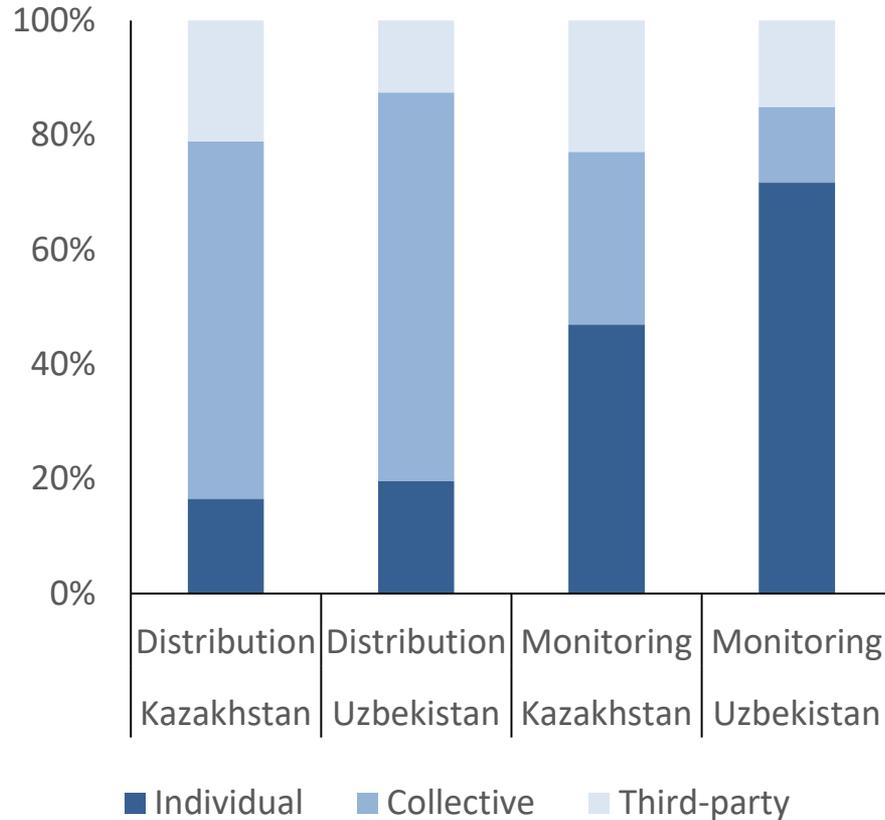


- Participations of farmers in cooperation in infrastructure maintenance was higher in Uzbekistan
  - (50% vs 22% in Kazakhstan)
- In Kazakhstan the share of formal way of cooperation in infrastructure maintenance was higher
- In Uzbekistan, farmers opted for informal forms of cooperating in infrastructure maintenance

■ No cooperation  
■ Only formally or mixed  
■ Informal agreement combined with hashar  
■ Hashar (voluntary free labor contribution)  
■ Informal agreement

Source: Based on AGRICHANGE farm survey (2019).

# Observed cooperation in “take some” water management



Most farmers arrange collective water distribution (agreed irrigation schedules to follow)

However, low collective approach for monitoring of compliance to agreed distribution rules

# (Some) Personal characteristics of cooperators in water management

Both in Turkistan and Samarkand, more likely to cooperate are farmers who...

- have more perceived freedom in crop choice
  - perceive caring about opinions of neighbors and relatives
  - have higher opinion about performance of irrigation water supply organization
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- In Kazakhstan, farmers caring about opinions of local authority do not cooperate
  - In Uzbekistan, authority-trusting farmers are more likely to cooperate

- The institutional environment (of autonomous decision-making) can facilitate individualized adaptation to water scarcity through crop choice
  - Lower crop-choice autonomy pushes farmers to cooperate when in need
- Respect to opinion of neighbors & relatives plays is stronger among ‘cooperators’
  - Social norms in promoting water users’ cooperation?
- Local image of water supply organization matters
  - Water users are more likely to cooperate within respected & trustworthy agencies
- Respect to opinion of public authorities has contrasting effects on cooperation
  - In Turkistan: promote individualism
  - In Uzbekistan: promote cooperation

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