

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)

Cooperation in water management:

Social dilemma

- 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

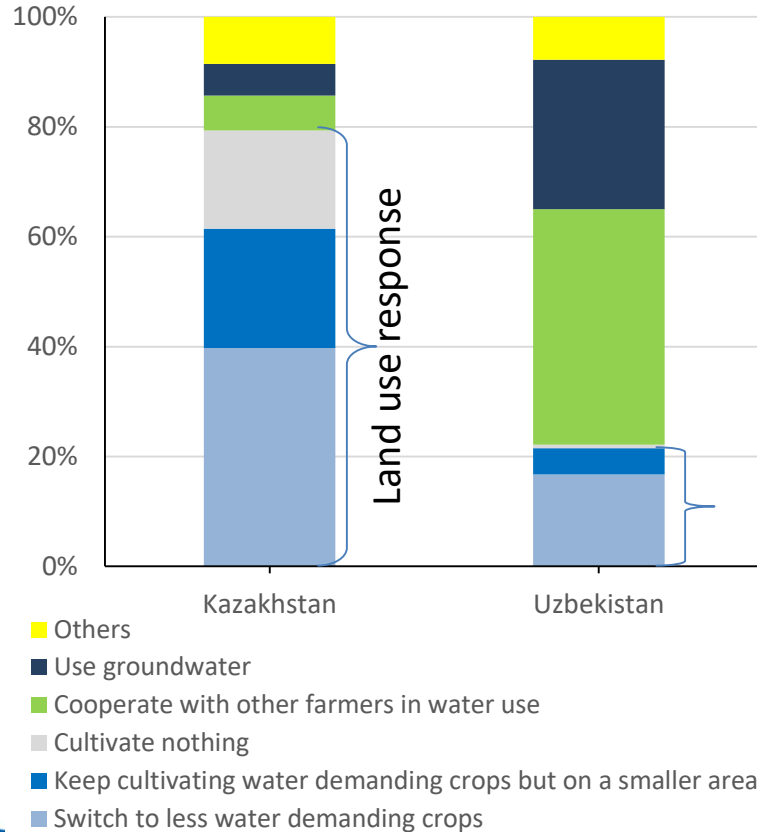
SUSADICA – Structured doctoral programme on Sustainable Agricultural Development in Central Asia www.iamo.de/susadica



Contrasting agricultural
institutional settings, e.g.:

- Decision making
autonomy

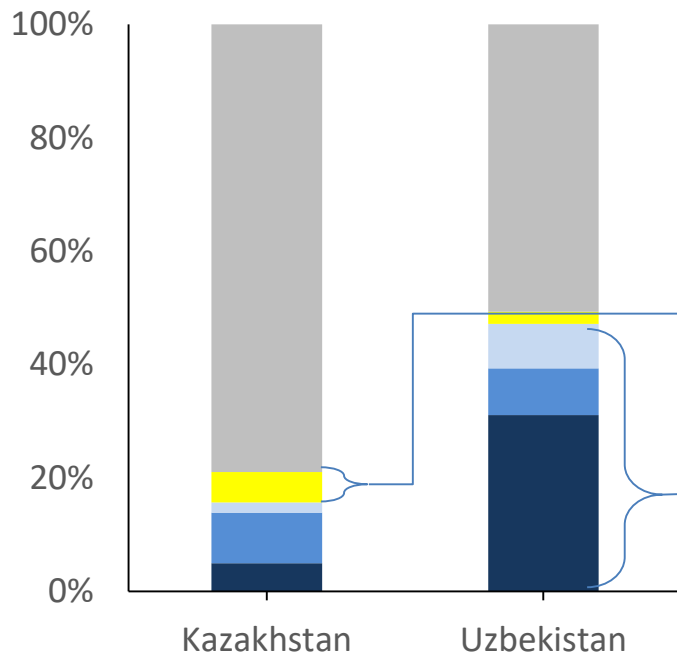
Farmers' responses in water-scarce years



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

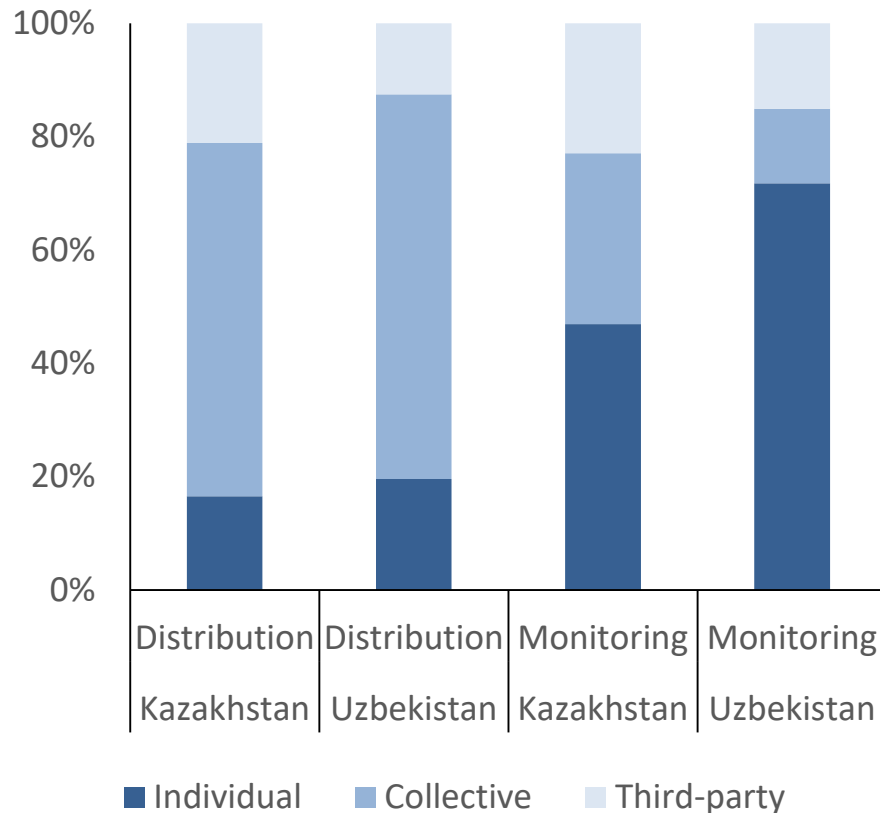


- Participations of farmers in cooperation in infrastructure maintenance was higher in Uzbekistan
 - (50% vs 22% in Kazakhstan)
- In Kazakhstan the share of formal way of cooperation in infrastructure maintenance was higher
- In Uzbekistan, farmers opted for informal forms of cooperating in infrastructure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