

AGRILINKS



Water Governance, Training and Gender in Agriculture: A New Evidence Base

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Joseph Price is a researcher specializing in the politics of natural resources, conflict and local governance. He recently worked as a Research Fellow at the International Water Management Institute in Sri Lanka and Tajikistan, is a Fellow of the Royal Geographical Society, and has produced publications and briefs for United Nations, government, private sector and public audiences. He holds an MPhil in International Relations and Politics at the University of Cambridge, for which he conducted field research on water conflict in Bolivia.

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Soumya is Senior Researcher in Environment and Development Economics at the International Water Management Institute—CGIAR. She uses economic methods to address environmental and development challenges in Asia and Africa. Her expertise in program evaluation and non-market valuation is based on fourteen years of field research in developing countries. Her work has been used by international aid agencies and financial organizations to inform investments and programs; and by governments in developing countries to design policy. Soumya has a bachelor's and master's degree in economic theory from the University of Delhi, and a PhD in Environmental Economics from Duke University.

Marie-Charlotte Buisson, International Water Management Institute



Marie-Charlotte Buisson conducts research in Development and Environmental Economics with a specialization in impact evaluation. She has expertise on sustainable management of natural resources, on the role of policy instruments and their relations with climate change and environmental sustainability. Her competencies are anchored on more than ten years of extensive field research in Africa, Southeast Asia and Central Asia. Her work aims to support the design of investments and programs, and to inform policy makers. She also contributes in building research capacity in developing countries. She now works as an independent consultant.

Enablers and Challenges for Water Institutions in Tajikistan

TOP TAKE-AWAYS

1

For new institutions, the length of training provided can be key

2

Even the best designed institutions often meet a complex local political and economic environment on the ground

3

New institutions must recognize traditional/informal forms of governance – should all aspects be formalized?

Institutional Change

- Following the disintegration of the Soviet Union and a 5-year civil war (1992-97), water user associations (WUAs) were introduced – follows global trend
- USAID worked with the Government of Tajikistan to draft WUA Law (2006) - several hundred WUAs established by USAID (FFP), other development agencies and the Government of Tajikistan
- WUAs: Legally identified as participatory water management body at the local level - mandated to perform core functions:
 - 1) Water delivery to private farms
 - 2) Routine repair and maintenance of secondary canals
 - 3) Collect irrigation fees and transfer to government
 - 4) Collect WUA membership fees
 - 5) 5) Resolve conflicts

USAID versus non-USAID WUAs

- For participatory institutions of collective action, member cooperation is required for co-production of services (Beresford, 2010) ----> training
- Key difference between USAID WUAs and non-USAID WUAs: training duration (20-24 months vs 3-6 months)



Do new WUAs with longer training perform mandated functions better than those with shorter training?

- Rapidly applying a 'blueprint' design may not fully account for nuances of community water management (Smith, 2008 and Thiel *et al.*, 2015)
- Without sufficiently lengthy training, 'farmers may not be ready or even interested in the task' of maintaining a WUA (Nagrah *et al.*, 2016)
- Brief training sessions can be perceived as patronizing (Ricks, 2016)
- Dominican Republic - 8 years' training of WUAs; 'longer the project, longer the success' (Yap-Salinas, 1994)

Methods

- Census of 74 USAID and 67 non-USAID WUAs
- Compared performance indicators between two groups (based on legally mandated functions of WUAs)
- Used modified difference-in-difference technique to compare performance between 2014 and 2016

Further detail: Balasubramanya, S.; Price, J.; Horbulyk, T. 2017. 'Impact assessments without true baselines: assessing the relative effects of training on the performance of water user associations in Southern Tajikistan'. *Water Economics and Policy*. <https://doi.org/10.1142/S2382624X18500078>.

Quantitative Findings from Tajikistan

- WUAs with longer training perform mandated functions better than those with shorter training, in particular:
 - recovered membership fees from 19% more of their members
 - 10% more likely to hold board meetings for planning activities before the start of the irrigation season
 - carried out routine repairs and maintenance of irrigation canals more frequently

Implications

- Estimates provide empirical evidence on how a policy intervention influences the performance of new institutions in their early days – valuable for adaptive management and future assessments
- Evidence supports the claim that longer training may enable water governance institutions to perform their functions better – useful if governments wish to expand WUA programs

Realities on the Ground: Contextual Challenges

- While training may improve WUA performance, wider contextual considerations exist:
 - Male migration to Russia, leading to increased importance of kitchen gardens
 - Traditional/informal governance
 - Associated conflicts



Policy Settings

- ‘Policy making and policy implementation do not occur in a vacuum. Rather, they take place in complex political and social settings, in which individuals and groups with unequal power interact within changing rules as they pursue conflicting interests’ (World Bank, 2017)
 - ‘Hybrid arrangements’ (Meagher *et al.*, 2014)
- Post-Soviet states (Sehring, 2009) - ‘Rules and organizations established by the state or international donor organizations are undermined by informal institutions. Yet, informal institutions are not only an obstacle to reform, but can also support it’.

Kitchen Gardens, Village Committees & WUAs

- No WUA membership/legal requirement for water delivery to kitchen gardens
- WUAs and village leaders regulate water for drinking and for kitchen gardens. Many are informal arrangements; some are formal. Ensures gardens enjoy an equal right to water
- Farms relatively new; kitchen gardens are traditional sources of food security (may account for 60% of water use in some settings where drinking water is included; but most often estimates vary between 12% and 25%).

The Role of Village Committees in Conflict Resolution

- Village leaders play a significant part in conflict resolution due to involvement with kitchen gardens, and the traditional role of authority and mediation
- The importance of the kitchen gardens may often be understood by WUAs, which have various mechanisms to link with villages - these recognize and use village leaders' influence
- The village leader often collaborates with the WUA leader to prevent or resolve conflicts
 - E.g. Agreement on an irrigation schedule based on zoning area covered by a WUA. Both farms and gardens receive water simultaneously when it is their turn to irrigate

Coordination, Collision, or Exclusion?

- Governance arrangements vary greatly between different communities - spectrum:
 - Village leaders on WUA conflict resolution committee (where locally powerful); even perceived to seek to dominate in cases
 - Written agreements to integrate village committees with WUAs, initiated by USAID
 - No evident agreements; only tacit universal recognition of importance of kitchen gardens

Towards Coordinated Water Governance

- World Bank influence to amend WUA law; informal WUA-village mechanisms operate to close gaps left by current legal framework
- Key issue: whether necessary governance mechanisms will survive informally (especially with stresses), or require strengthening/formalizing – iterative process?
- Need to focus on different institutions being able to function effectively and cooperatively to reduce tradeoffs between different production systems

RECOMMENDATIONS

1

Recommendation

The length of training provided to water governance institutions should be a key factor in program design

USAID provided longer training to WUAs, associated with better fulfilment of mandated functions

2

Recommendation

To maintain the WUA institutional system, bringing kitchen gardens into WUA membership may increase revenues and improve coordination

There are various options for strengthening or formalizing coordinating mechanisms

Increasing Capacities and Capabilities of Female Tajik Farmers to Sustain Participatory Water Governance

TOP TAKE-AWAYS

- ① Participatory irrigation in Tajikistan trained managers (male)
- ② With rapid male migration, females increasingly operate farms
- ③ Farms operated by females are less likely to pay dues, enter into water contracts, be represented at irrigation planning meetings
- ④ Sustaining participatory irrigation management in Tajikistan depends on directly investing in female human capital

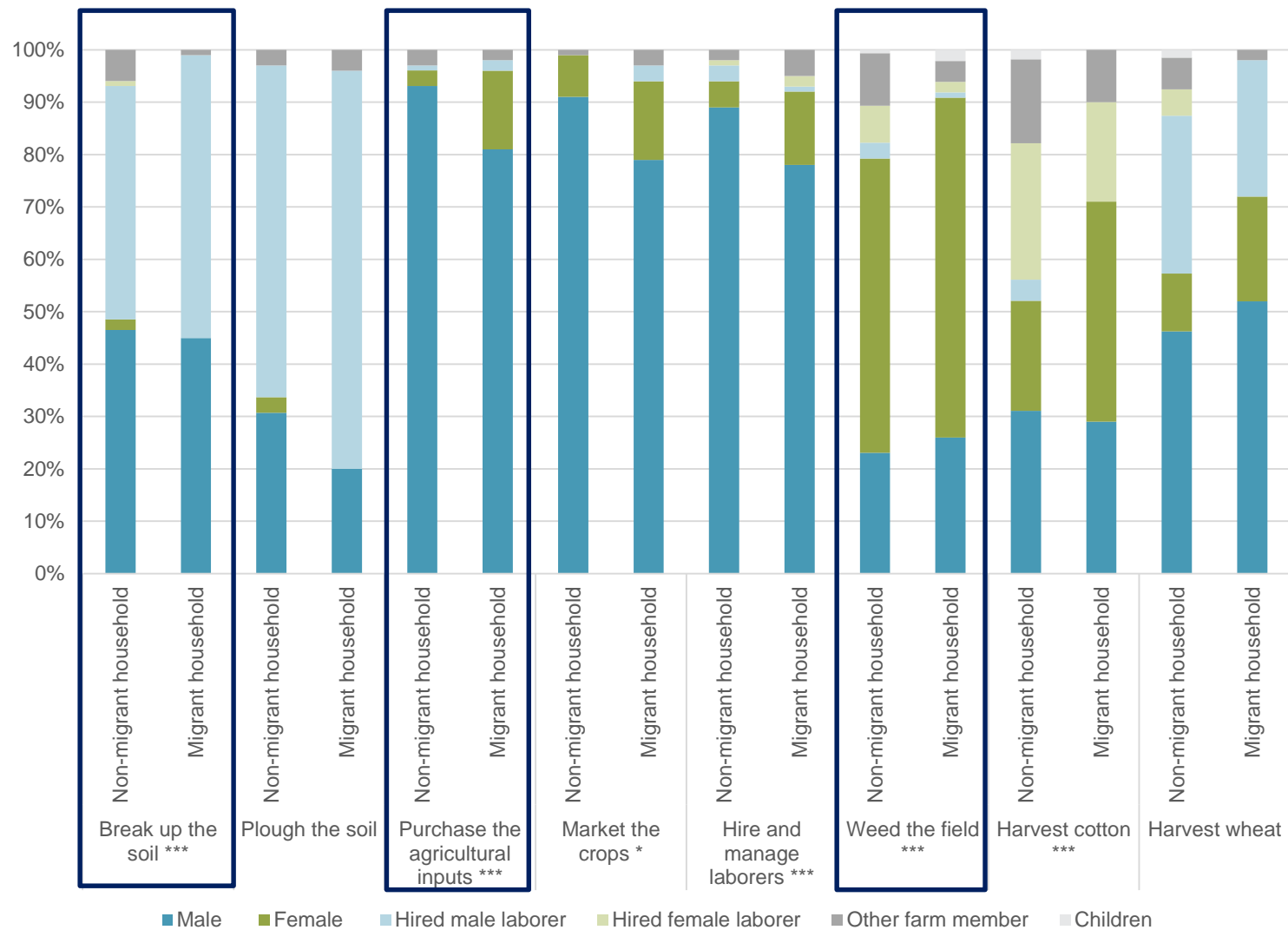
Male Migration is High

- ~48% rural households have migrants (Buisson *et al.*, 2016)
- Do women take over the activities traditionally performed by males or do they hire labor?

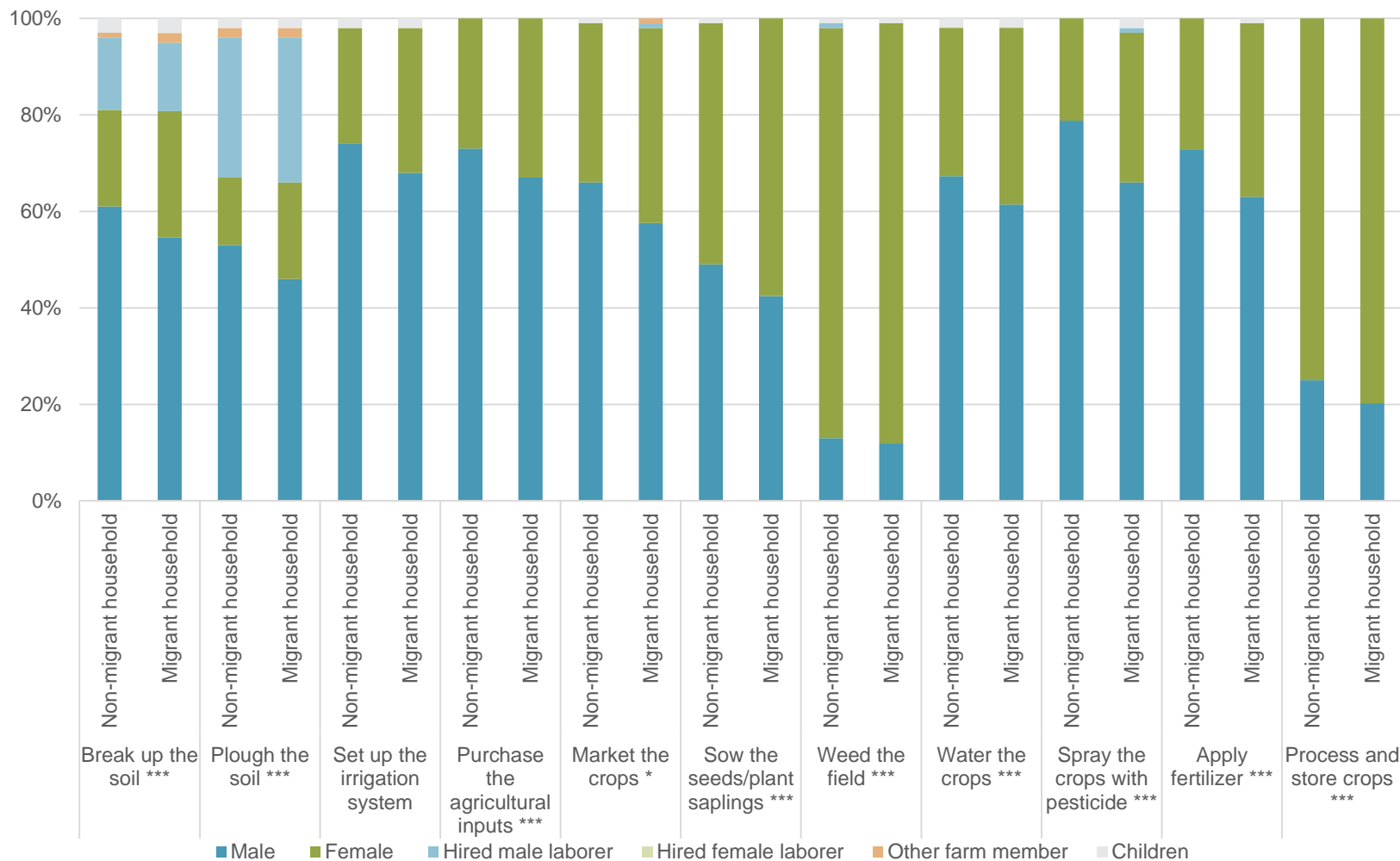


“Feminization” of Labor-Intensive Tasks

- 1,920 households across 80 *jamoats*, 160 villages, in southern Tajikistan; comparing migrant households to other households
- Migrant households hire male laborers to perform capital-intensive tasks (e.g. preparing the soil)
- In a small fraction of migrant households, women take on managerial tasks (e.g. purchasing inputs, hiring laborers, attending WUA meetings)
- In most migrant households, women take on labor-intensive tasks (e.g. weeding, cotton harvesting, irrigation)



Kitchen gardens



Farm Managers Were Trained in Participatory Water Governance

- Legal position; listed on title
- 98% managers male (FAO 2018)
- Agricultural economics:
 - Lead/male farmers have stronger networks to diffuse information (Anderson and Feder, 2007)
 - Improve cost-effectiveness of trainings (Feder *et al.*, 2004)

Farms Are Being Operated by Other Workers

- Farms operated by non-trained members (Balasubramanya *et al.*, 2018)
 - Non-trained males: 30% of farms
 - Non-trained females: 20% of farms
- Information on governance needs to diffuse from managers to non-trained workers to sustain participatory irrigation
- Development economics: Diffusion depends on
 - Complexity of information (e.g. Rola *et al.*, 2002)
 - Density of trained farmers (e.g. Tripp *et al.*, 2005)
 - Gender composition of trained and untrained (e.g. Kumar and Quisumbing, 2011; Beaman and Dillon, 2018)
 - Farmer and farm characteristics (e.g. Fuglie and Kascak, 2001)

Research Questions

- Does length of training affect participation?
 - Yes; a positive effect
- Is participation affected when farm operated by non-trained member?
 - Not when male
 - Participation significantly lower when female
- Implications for WUA functioning
 - Potentially serious

Adapt Standard Methodologies to Establish Causal Relationships

- Areas with longer training may historically have been more integrated into communities
- Farms with lowest capacity workers may be less likely to migrate
- Females are likely to operate farms only when no other male is left
- Before WUAs were created, no participatory institutions existed

Study Design, Data & Methods

- Selected subdistricts where farms were imparted longer and shorter training in matched pairs
- In selected subdistricts: stratified random sample of 2,000 farms
- Two surveys:
 - First in 2015 (for 2014 year)
 - Second in 2017 (for 2016 year)
- Econometric estimation using difference-in-differences

Balasubramanya, S.; Price, J.; Horbulyk, T. 2017. Impact assessments without true baselines: assessing the relative effects of training on the performance of water user associations in Southern Tajikistan. *Water Economics and Policy*. <https://doi.org/10.1142/S2382624X18500078>.

Participation Indicators

Irrigation fees

Fees were paid for both irrigation seasons in the year

WUA membership fees

Membership fees were paid for the calendar year

Participation in pre-irrigation cleaning of canals

of person-days supplied by farm towards cleaning

Legal relations

Farm signed a contract with the WUA

Farm member(s) attended WUA meetings

Time-varying farm characteristics

Farm operated by non-trained male

Farm operated by female

Number of members

Share of members that were female

Share of members that spent majority of time on farm

Number of households

Area with official title (ha)

Cultivated area (ha)

Irrigated area (ha)

Farm cultivated cotton

Area under cotton cultivation (ha)

Time-invariant farm characteristics

Age of the farm

Age of farm manager

Education of farm manager

Distance of farm from road

Time-invariant subdistrict characteristics

Dummy for subdistrict

	Irrigation fees	Membership fees	# man-days	Farm signed a water contract	Farm attended WUA meetings
	paid	paid	labor		
Longer training	-0.06 (0.05)	0.08 (0.05)*	7.10 (2.40)***	0.20 (0.05)***	0.09 (0.04)**
Farm operated by non- trained male	-0.02 (0.04)	-0.02 (0.02)	-2.43 (1.85)*	-0.02 (0.03)	-0.01 (0.02)
Farm operated by female	0.03 (0.05)	-0.09 (0.03)***	3.21 (1.94)	-0.11 (0.04)**	-0.03 (0.01)*
Number observations	1753	1753	1561	1753	1753
Prob > F	0.28	0.57	0.01	0.00	0.09
R-squared	0.02	0.04	0.02	0.09	0.03

Implications for WUA Functioning

- Non-payment of membership fees compromises financial health of WUA; affects operations
- Not signing contract: district irrigation department budgets less water for particular WUA than what is actually needed
- Not attending meetings: affects planning of irrigation schedule

Reasons for Lower Participation

- 6 FGDs with female irrigators; 5 females/group
 - Women believe only managers can attend meetings: non-managers are not allowed to attend
 - Irrigation scheduling at inconvenient times (midnight): less inclined to pay membership fees
 - Not clear about the purpose and frequency of contract

RECOMMENDATIONS

1

Recommendation

Clarify WUA Law:

Any nominated member can attend

2

Recommendation

Train female farmers directly:

Diffusion networks may not be sufficient

3

Recommendation

Train WUA to cope with changing demographics:

e.g. using membership fees to hire wage labor to irrigate female-managed farms

4

Recommendation

Build capacity of district irrigation departments:

e.g. WUA liaison officer

- Project details and resources: <https://agrilinks.org/library/impact-water-users-associations-water-and-land-productivity-equity-and-food-security>
- Balasubramanya, S., Price, J., Horbulyk, T. 2018. Impact assessments without true baselines: assessing the relative effects of training on the performance of water user associations in Southern Tajikistan. *Water Economics and Policy*.
<https://doi.org/10.1142/S2382624X18500078>.
- Balasubramanya, S. 2018. Effects of training duration and the role of gender on farm participation in water user associations in Southern Tajikistan: implications for irrigation management(in review).
- Balasubramanya, S., Buisson, M.C., Saikia, P., MacDonald, K., Aslamy, S., Horbulyk, T., Hannah, C., Yakubov, M., Platonov, A. (2016). Impact of water-user associations on water and land productivity, equity, and food security in Tajikistan. Baseline Technical Report. Colombo, Sri Lanka: International Water Management Institute. Prepared for the United States Agency for International Development, USAID Grant Number AID-BFS-G-11-00002.
<https://tinyurl.com/ybrbjqqf>
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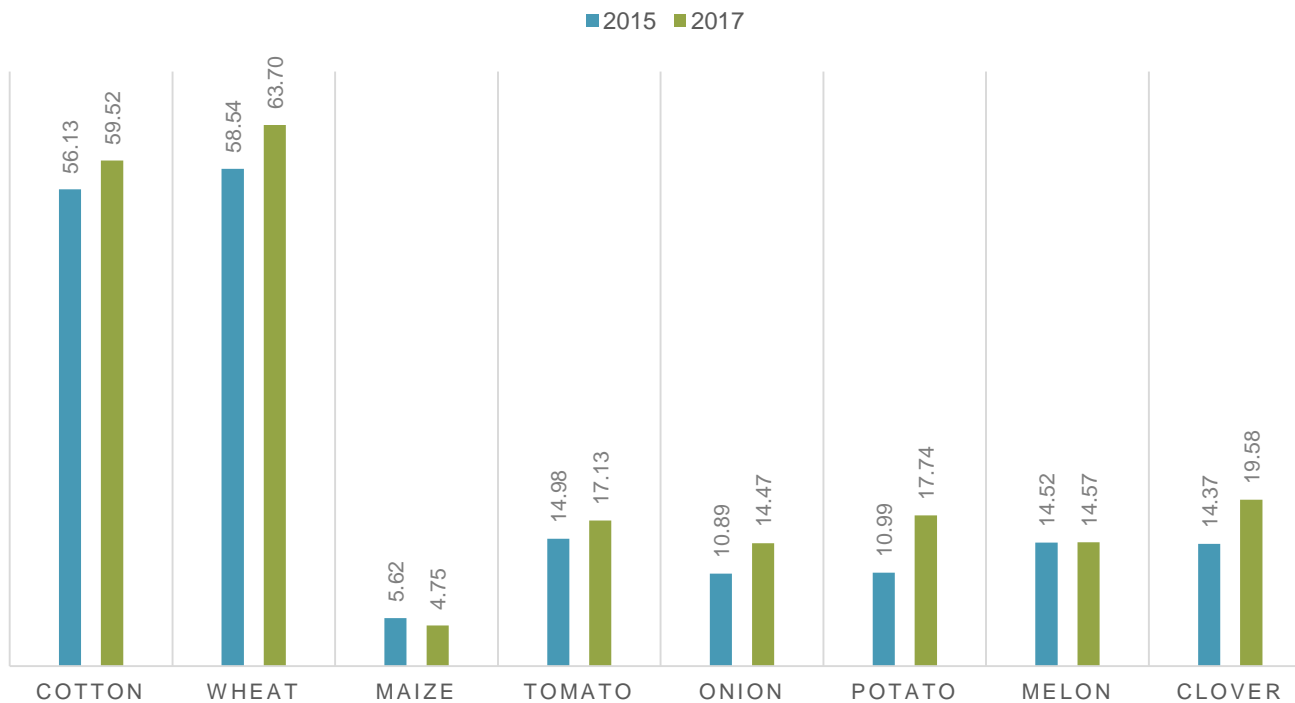
Traditional Farming or High Value Crops?

A Comprehensive Approach Helps Tajik Farmers to Choose Crops

TOP TAKE-AWAYS

- 1 Cultivating cotton for cash and wheat for food is the dominant cropping pattern in South Tajikistan but faces risks.
- 2 Diversification of crops can support incomes and food diversification but faces constraints.
- 3 Farms served by USAID-supported WUAs benefitted from water services and agricultural extension services.
- 4 Improved irrigation service boosts staple production, while diversification into high-value crops requires both water delivery and agricultural extension services.

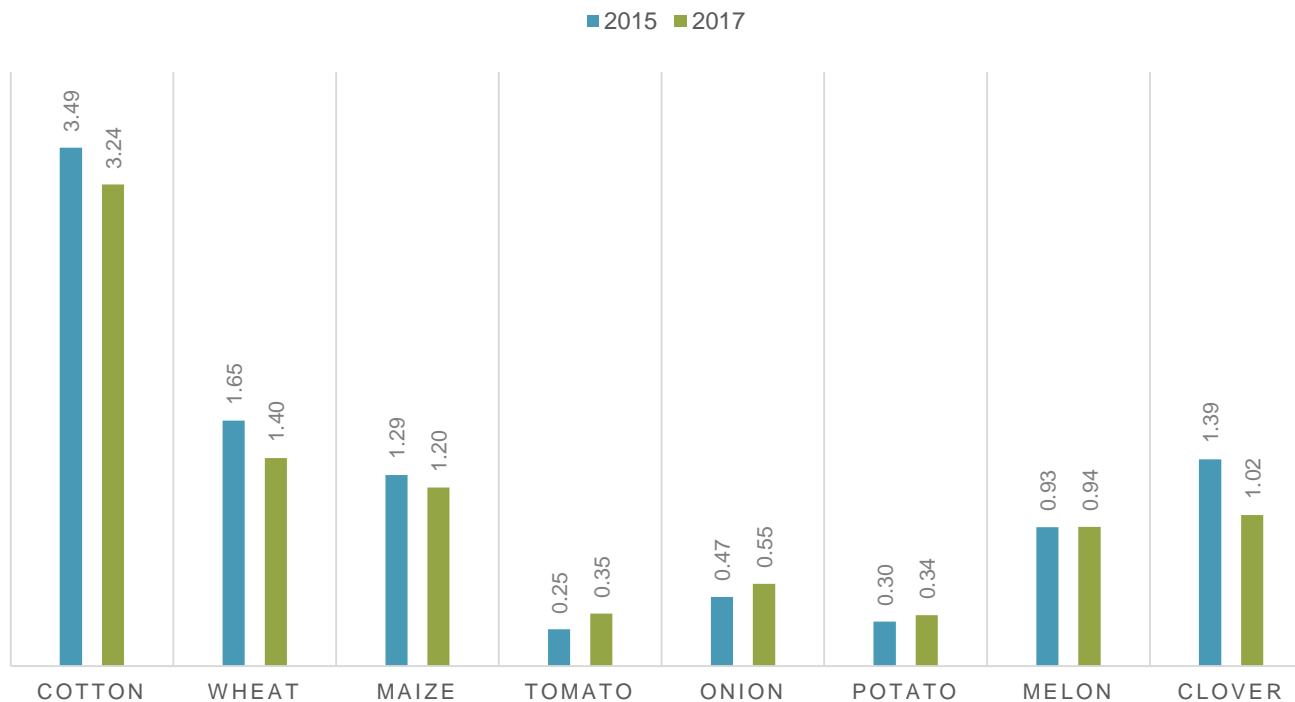
Crop Choices – Type of Crops



Source: Authors' calculation based on survey data collected in 2015 and 2017.

Figure 1. Percentage of farms cultivating different crops.

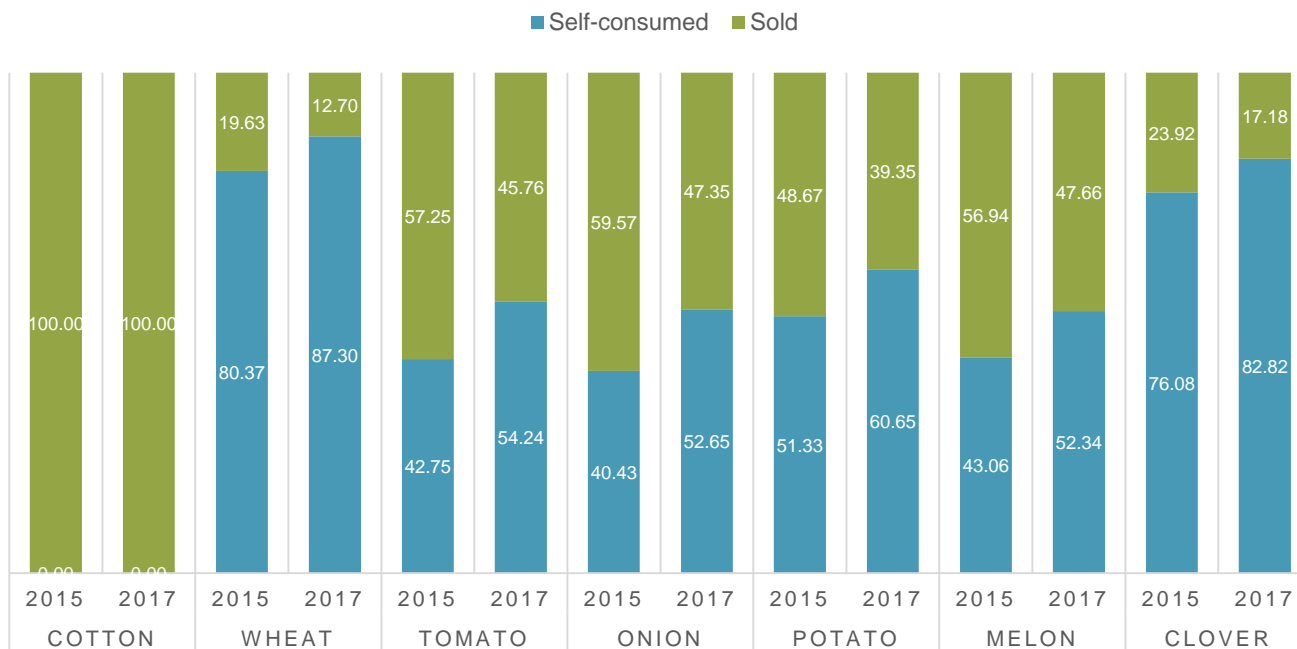
Crop Choices - Areas



Source: Authors' calculation based on survey data collected in 2015 and 2017.

Figure 2. Areas allocated for the cultivation of different crops (in hectares).

Sale or Self-Consumption?



Source: Authors' calculation based on survey data collected in 2015 and 2017.

Figure 3. Percentage of production used for self-consumption or for sale (by crop).

Traditional Farming: 'Cotton for Cash Wheat for Food'

COTTON

- Second highest export earner
- Farm prices regulated, harvests purchased by a few companies

At farm level, **limited profitability**, BUT

- Cultivating cotton provides stalks for heating and feeding fodder
- Debts and links between farmers and 'future' companies, personal networks, community norms



WHEAT

- Staple food, main source of **nutrition**
- Fluctuating prices of imported wheat
- Government's agricultural policy targeted toward food security and independence
- Area under wheat cultivation has more than doubled since independence in 1991, but 40% of the wheat consumed is still imported

Risks Associated with Traditional Farming

- Impacts of climate change in the Central Asian region→ Productivity of wheat and cotton is likely to fall (Mannig et al., 2013; Bobojonov and Aw-Hassan, 2014; Sommer et al., 2013)
- Cotton is a highly water-dependent cash crop, vulnerable to water availability, state of infrastructure, energy costs or institutional environment
- Cotton market not profitable
- Alternative risk management mechanisms (forward markets, crop insurance) are limited

Opportunities and Constraints Associated with High Value Crops

Introduction of diversity in cropping systems may lead to

- **varied sources of incomes** for farms
- more **diversified food intakes** for households



BUT

- Limited dissemination of technologies and information
- Lack of input markets for alternative crops
- Limited credit facilities associated with limited land market
- Absence of cold storage and processing facilities
- Volatility in vegetable prices

Evaluation Question

- Primary objective of Water User Associations (WUAs): manage water through operation and maintenance of the water bodies or structures on the basis of a decentralized, participatory and multi-sectoral governance structure. However: → WUAs can also **influence other components of agricultural decisions**
- **Influence of WUAs on the crop choices made by Tajik farms and on their diversification strategies? To what extent WUAs reinforce the 'cotton for cash, wheat for food' model or strengthen the development of alternative cropping systems?**
- Analysis is based on an impact evaluation of the WUAs supported by the United States Agency for International Development (USAID) in Khatlon Province of Tajikistan.

Data and Methods

- **1,956 *dehkan* farms** in Khatlon Province surveyed in **2015 and 2017**
- **Treated farms:** *dehkan* farms receiving water from USAID WUAs
- **Control farms:** *dehkan* farms served by non-USAID WUAs, supported by other donors or formed through initiatives of local governments
- Sample design based on two steps:
 - **Matching** to select treated and control subdistricts
 - **Proportional random sampling** to select the farms

Intervention not considered as a monolithic package, but split into different components:

- **water delivery services**
- **agricultural extension services**



Determinants of Crop Choice

Cotton and Wheat

Water delivery services partly determine the cultivated area of cotton and wheat.

- A better perception of water sharing is associated with the cultivation of 0.23 additional hectares of cotton.
- Farmers that perceive an improvement in the quantity of water delivered cultivated 0.49 less hectares of wheat.

The cultivated areas for cotton and wheat are not determined by agricultural extension services measured by whether the farm had received any formal training; and by the number of interactions (if any) with farmer groups pertaining to agriculture and/or water.

Determinants of Crop Choice

Other Crops

Water delivery services, especially through infrastructure rehabilitation, underpin farmers' decisions toward more crop diversification.

- A better perception of the condition of the watercourse is associated with the cultivation of 0.15 additional crops on the farm

Formal as well as informal agricultural extension services linked to the establishment and development of WUAs shaped cropping choices toward alternative crops.

- Farms that received formal agricultural training cultivate 0.26 additional crops (most important determinant)
- Interacting more often with the group results in cultivating 0.14 additional hectares with alternative crops



Determinants of Cropping Intensity and Diversification



Infrastructure rehabilitation has a positive effect on the cropping intensity and diversity index (measured with the Margalef's index).

- A better perception of the condition of the watercourse is associated with an increase of 3.06% of the cropping intensity.



Training of the farm members on agricultural practices and technologies is a positive determinant of diversification.

- Farmers who benefitted from the formal agricultural extension services provided by USAID partners tend to have more diversified cropping patterns.

RECOMMENDATIONS

1

Recommendation

Water governance should be considered as one of the agricultural challenges in the project design phase and not be isolated.

USAID designed its WUA support program to address water and other production challenges.

2

Recommendation

A comprehensive approach in program implementation widens the range of potential impacts.

Instead of water only services, members of USAID-supported WUAs benefitted from agricultural extension services which strengthen not only dominant agricultural practices but give them the opportunity to shift to high-value crops.

Questions and Answers

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1

Join us for the next Agrilinks webinar!

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June 6, 2018, 9:30 - 11:00 AM EDT: <https://bit.ly/2ko3OMI>

2

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June 7, 2018, 10:00 -10:30 AM EDT: <https://bit.ly/2IINDYB>

3

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