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Putting Research Knowledge into Action

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Strengthening participatory irrigation management in Tajikistan

Tajikistan has made a significant effort to strengthen its agricultural irrigation systems, which fell into serious disrepair after the collapse of the Soviet Union and the country's ensuing civil war. With support from international organizations, particularly the United States Agency for International Development (USAID), Tajikistan established water user associations (WUAs) throughout the country to foster participatory irrigation management. WUA members are drawn from the thousands of private (*dehkan*) farms that replaced the enormous collective farms established under Soviet rule. Both the government and USAID provided training to support the establishment of the WUAs. USAID provided longer training in water governance, and supplemented this with formal and informal agricultural extension services. Scientists with the International Water Management Institute (IWMI) recently conducted a series of detailed surveys and economic analyses of WUAs, farms and households in southern Tajikistan to determine the key factors driving the success of participatory irrigation. The researchers were also interested in learning how the increasing out-migration of male labor and the consequent "feminization" of agriculture are affecting water management in Tajikistan.

Key messages

- IWMI's research found that farmers who received longer training in water governance and management tended to participate more actively in their WUAs than farmers who were trained over relatively short periods of time.
- When a trained male farmer leaves the farm in search of better job opportunities, he tends to transmit what he has learned to the person who inherits his duties if that person is a man, but not if a woman has taken his place. Only men have received training so far, but this clearly must change as more and more women become *dehkan* farm managers.
- Since WUAs serve *dehkan* farms, while village committees oversee kitchen gardens, a combination of formal and informal governance mechanisms may be needed to reduce conflict and increase coordination over irrigation water between different production systems. Kitchen gardens are managed by women and are crucial to household food security.
- Combining training in irrigation services with agricultural extension not only strengthens the production of Tajikistan's traditional staples – cotton and wheat – but also helps farmers shift to high-value crops.

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Background

Over 70% of the population of Tajikistan resides in rural areas, particularly in the southern part of the country. Agriculture accounts for about 60% of employment and is the main source of gross domestic product. Around 95% of crop production takes place on irrigated land. During the Soviet era, production was strictly limited to just two crops: cotton for sale and wheat for food. The country relied on imports from other Soviet republics for additional commodities.

The mandatory cultivation of cotton and wheat has been relaxed, but the production of these crops still dominates, in part because farmers lack experience in growing other crops. Cotton fiber is Tajikistan's second largest export earner, and cotton remains the most common cash crop. Bread, mostly made with wheat flour, is Tajikistan's staple food and the main source of nutrition, providing 52% of daily energy intake. The country consumes more wheat than anywhere else in the world, nearly 170 kilograms per person each year.

When the Soviet Union collapsed in 1991, Tajikistan almost immediately fell into civil war. The conflict, which lasted until 1997, undermined public services and infrastructure, including irrigation. After the civil war, the Soviet era's collective farms were divided into thousands of smaller private farms, known as *dehkan* farms, of around 3-5 ha each. The district irrigation departments, which had been responsible for delivering water to the collective farms through an extensive network of canals, were unable to manage the demands of the new private farms. Deprived of Soviet subsidies, Russian expertise and technical skills, Tajikistan's irrigation system fell into serious disrepair (Figure 1), causing a significant decline in the country's agricultural productivity.

Recognizing the urgent need to rehabilitate its irrigation systems, the government decided to establish WUAs, whose members – notably limited to *dehkan* farms – would take on the responsibility for overseeing the delivery of water to the farms. In 2006, Tajikistan passed the *WUA Law*, which spells out the roles of members. The *dehkan* farms are expected to pay an irrigation service fee every season and an annual membership fee to cover the cost of WUA operations. They are expected to send representatives to WUA meetings, help resolve irrigation-related conflicts, and provide volunteer labor to repair and maintain irrigation canals. With assistance from international organizations – most notably USAID – Tajikistan established WUAs throughout the country, starting in 2011-2012. Both USAID and the government provided the managers of *dehkan* farms – 98% of whom were men – with training on the duties involved in participating in the WUAs. Today, more than 400 WUAs operate in the country, each covering, on average, 1,400 to 1,600 ha.

IWMI recently conducted a series of studies on participatory irrigation management in Tajikistan. Researchers paid particular attention to factors that could undermine water governance and limit crop diversification in order to generate evidence for future planning.

FIGURE 1. The irrigation systems of Tajikistan fell into serious disrepair after the collapse of the Soviet Union and the country's ensuing civil war (*photo:* Neil Palmer/IWMI).

The findings

1. More extensive training increases the likelihood of farmers participating in WUAs

The USAID-led training for farm managers lasted about 2 years, while the training led by the government lasted just 3 to 6 months. USAID also offered agricultural extension services and coordinated meetings to provide farm managers with information about new technologies and alternative crops.

IWMI surveyed 141 WUAs in southern Tajikistan twice to collect data for the 2014 and 2016 calendar years. Seventy-four of the WUAs surveyed were established by USAID and received 22-24 months of training, while 67 were created by the government and received 3 to 6 months of training. The surveys collected extensive data on the activities of the WUAs as well as on factors that might affect their performance, such as irrigation infrastructure, size of irrigated areas, number and gender composition of WUA board members, occurrence of water disputes, and office bearers' perceptions about the quality of irrigation infrastructure. Research findings indicated that a longer training period enabled WUAs to more effectively carry out their mandated responsibilities, particularly the recovery of membership fees from 19% more members.

A second IWMI study surveyed 1,855 member-farms in 80 subdistricts (known as *jamoats*) in southern Tajikistan twice to collect data for the 2014 and 2016 calendar years. The farm managers in 40 *jamoats* received more extensive training from USAID, while those in the other subdistricts received less training. Researchers found that farmers who received longer training were 8% more likely to pay their membership fees, 20% more likely to sign a contract with the WUA and 9% more likely to attend WUA meetings. *Dehkan* farms, whose managers (e.g., see Box 1) received longer training, also contributed seven additional person-days of labor towards the repair and maintenance of canals.

BOX 1. Abdullaeva Uguloi, Head of the Obchakoron District WUA.

Abdullaeva Uguloi has been a *dehkan* farmer for 20 years. The Obchakoron District WUA was formed in 2012, and she was hired as the secretary. After 4 months, the WUA head quit; he said it was too much work and pressure to manage all the farms and finances.

Photo: Madeline Dahm/IWMI

"Everyone thought it (the WUA) was destroyed," said Abdullaeva. She stepped in and kept managing things after the head quit, and the other members encouraged her to keep the office open. "*I kept going to the US Embassy and all the authorities. They all remember me very well. I collected 4.5 million somoni in water fees, and they started to be more interested. We showed them we can work.*"

The system was on the brink of crumbling when she stepped in. Abdullaeva has been the head of the WUA of Obchakoron for almost 6 years.

"We've almost graduated from what we call the USAID University. For the last 6 years, we have been at the USAID University. By the time this is done, we could have a diploma. We've learned and done so many things."

"The problem is that we have one canal that is divided among multiple water user associations, so when others create problems it becomes my problem," said Abdullaeva. "So, I am forming a federation of these WUAs." She is calling this a friendship. There are six WUAs that she's working with to establish a protocol for cross-district water use. "Some of these other WUAs I work with are not in the USAID training program. We need educated specialists and WUA heads."

2. Women farmers need additional support

Recent years have seen a major upswing in out-migration, mostly by men in search of better jobs. One consequence is that nearly half of the *dehkan* farms have been turned over to managers that have never received WUA training.

IWMI's research with 1,855 farms also examined the impact of male out-migration on participatory irrigation management. They discovered that, when trained male farmers migrate, they usually pass on what they have learned about WUAs to the men who take up their responsibilities but not to the women. This is because male farmers pass on technical information to other males, but not to females who have culturally not been associated with technical tasks. As a result, women do not receive critical information about water delivery.

Unsurprisingly, participation in the WUAs was not affected when farming responsibilities were taken over by untrained male workers, since they had access to irrigation information. However, when the farm was operated by a female worker, it was 9% less likely to pay WUA membership fees than farms operated by males, 11% less likely to sign a water contract, and 3% less likely to attend the WUA meetings. All three factors threaten the health of WUAs: Non-payment of membership fees puts WUA operations at risk; unsigned water contracts mean that the district water offices budget for less water than what is needed; and lack of attendance at meetings means that women have no input in the planning of the irrigation schedule. This has serious implications for irrigation management, since women now operate around 20-25% of all *dehkan* farms in Tajikistan.

IWMI researchers also interviewed women farmers in over 1,900 households in 160 villages across southern Tajikistan. When male farmers leave, they usually pass on their labor-intensive work (e.g., planting, weeding and harvesting) to women (Figure 2). Women are less likely to assume managerial tasks (e.g., purchasing inputs and attending WUA meetings) and even less likely to take on mechanized jobs (e.g., operating equipment). Given their traditional domestic and family care responsibilities, it is extraordinarily difficult for women to manage the additional tasks left to them by departing men. Also, while women may lack the capacity to handle capital-intensive and managerial work on the farm, these tasks still need to be carried out, and that usually means either hiring male labor or reducing crop production on farms to concentrate on kitchen gardens. Any reduction in the number of operational *dehkan* farms means fewer livelihood opportunities for farmers, and fewer membership fees available to support the WUAs. If WUAs are not able to raise adequate membership fees then water services to kitchen gardens are also compromised, since the same canals deliver water to gardens and farms. It is clear that the key to sustainable participatory irrigation systems in Tajikistan is direct investment in technical training for women to ensure that they – as well as men – have access to the knowledge they need in their new roles.

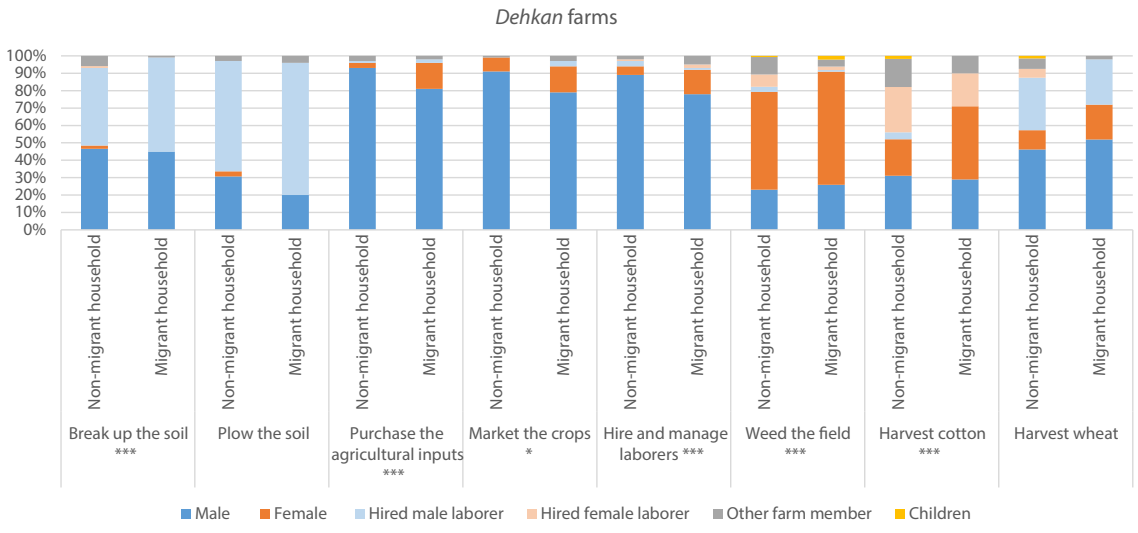

FIGURE 2. Percentage of households where women perform agricultural tasks.
Source: Authors' calculations based on survey data collected for the 2014 and 2016 cropping years.
Notes: * indicates differences are significant at 10%; *** indicates differences are significant at 1%.

3. Coordinated local water governance is key to resolving water disputes

Mahalla committees are traditional neighborhood councils. They are elected by the community to address local problems. *Mahalla* committees play a significant role in local water governance, in particular by regulating the use of water in kitchen gardens. These are small plots close to the farmer's home where women grow food for the household (Figure 3). Kitchen gardens are not legally eligible for WUA membership, and canal water is often diverted to irrigate kitchen garden plots before the water reaches the *dehkan* farms. *Dehkan* farm water users, who pay WUA membership fees for irrigation services, often receive water only after kitchen garden water users siphon off water (both farms and gardens pay irrigation service fees).

FIGURE 3. Nazokhat in her kitchen garden in Tajikistan (*photo:* Madeline Dahm/IWMI).

Since the kitchen gardens are critical to the food security of rural households, informal governance mechanisms have emerged to coordinate water use between *dehkan* farms and kitchen gardens. In some places, *mahalla* leaders work with the WUA board to agree on irrigation schedules so that both gardens and farms are served in a timely manner. In other cases, *mahalla* committees sign contracts with WUAs, so that kitchen gardens may be served.

Yet, in many cases, informal governance mechanisms do not evolve, and this results in conflicts between water users. This underscores the importance of considering more formal options to achieve comprehensive coordination among different institutions and water users. One option is to revise the WUA law, so that membership is open to kitchen gardens, even if they remain non-commercial entities. Allowing kitchen garden users to be members of the WUAs may give them rightful access to irrigation water, facilitate the coordination of water users across different production systems and increase the membership fees available to support WUAs.

4. A combination of interventions works best

Introducing greater crop diversity in farming systems reduces risks from pests and climate change, decreases nutrient loss in soils, and offers new sources of income for farms and more nutritious diets for households (Figure 4). IWMI also used data from *dehkan* farms in southern Tajikistan, which was collected for two calendar years, to determine whether the WUAs and WUA training influenced the crop choices and diversification strategies adopted by farmers.

The results demonstrate a distinct increase in the cultivation of additional crops (e.g., tomato, onion, potato and melon) between 2014 and 2016 (Figure 5).

For example, potatoes were cultivated by 10.9% of the farms in 2014 and by 17.7% in 2016. At the same time, the cultivated areas of cotton and wheat decreased by 7.1% and 15.2%, respectively. Crop diversification was particularly evident on the *dehkan* farms managed by people who had received training from USAID. Only USAID included extension services in its WUA interventions, which suggests that combining the improvement of water delivery services with agricultural extension may prompt farmers to consume and sell a greater diversity of crops.

Another factor influencing farmers' decisions to diversify their crops was their perception that the water delivery infrastructure available to them was adequate.

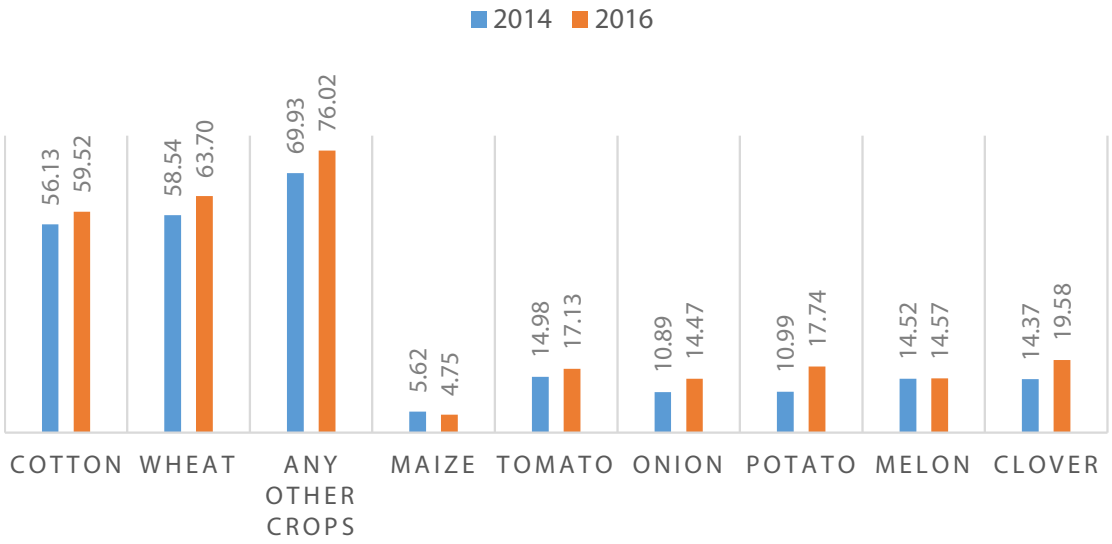

FIGURE 4. Percentage of farms cultivating different crops.
Source: Authors' calculations based on survey data collected for the 2014 and 2016 cropping years.

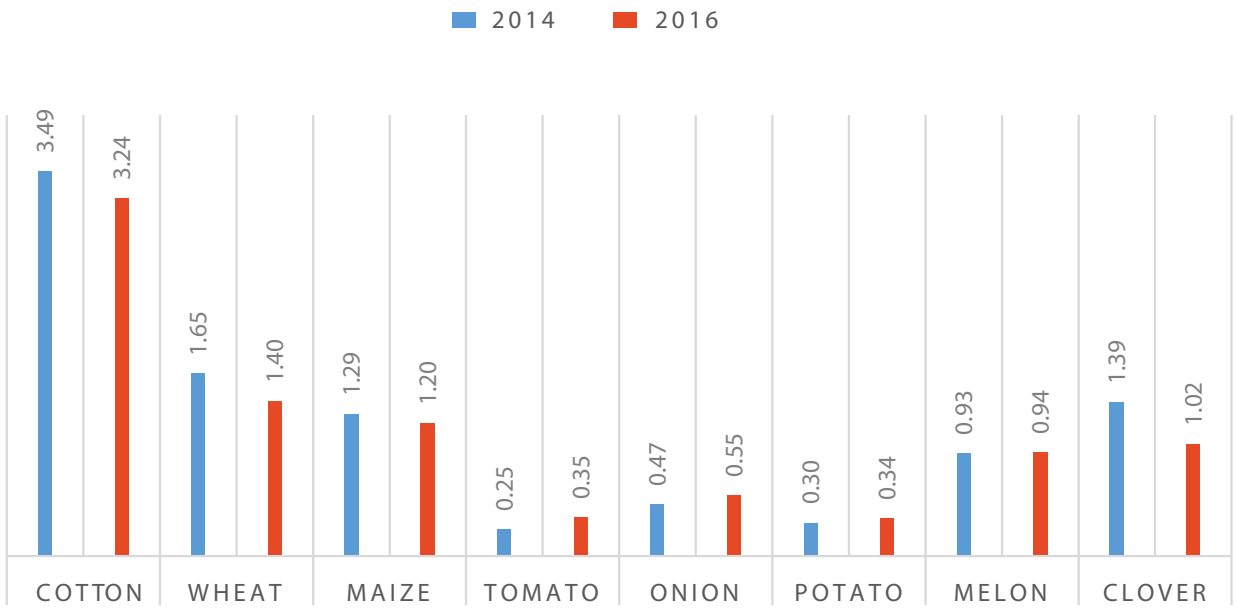

FIGURE 5. Areas allocated for the cultivation of different crops on the farm (in hectares).
Source: Authors' calculations based on survey data collected for the 2014 and 2016 cropping years.

Farmers served by USAID-funded WUAs perceived the condition of their infrastructure to have improved more than farmers served by government-funded WUAs. As a result, the USAID-funded WUA intervention contributed to increasing the number of crops cultivated by the *dehkan* farms.

IWMI's findings highlight the essential role of a comprehensive approach to program planning. USAID designed its WUA intervention to address water as well as the other production challenges faced by farmers. While the production of cotton and wheat still dominates and can be supported by improving irrigation services, this does not prevent farmers from adding greater diversity to their production systems (Figure 6). Agricultural extension can play an important role in supporting diversification, especially when knowledge about cultivating alternative crops is limited. Lack of input markets for such crops, inadequate credit facilities, cold storage and processing facilities, and volatility in vegetable prices are additional constraints to diversification that could also be addressed in program planning.

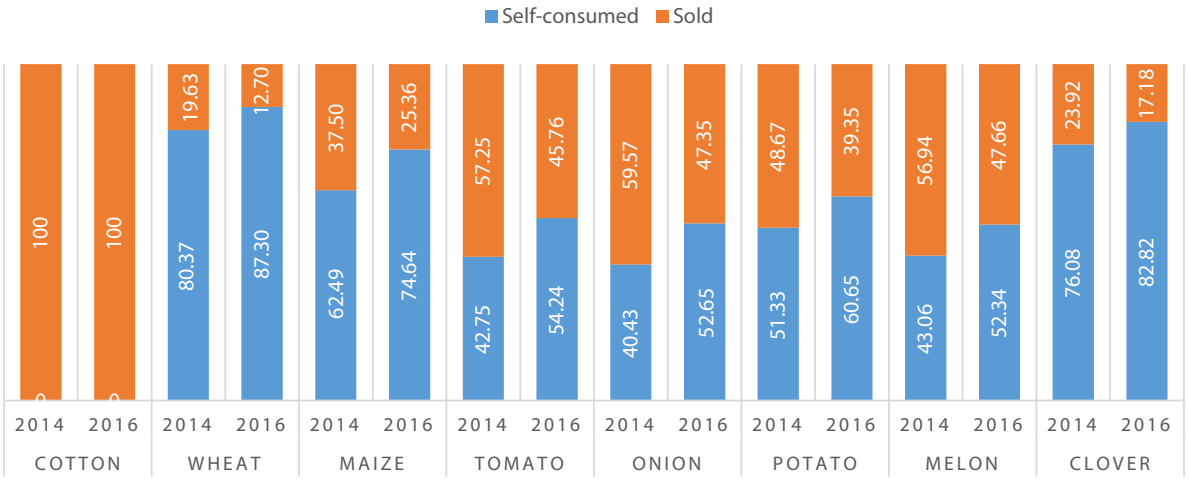

FIGURE 6. Percentage of farm harvest used for self-consumption or for sale (by crop).
Source: Authors' calculations based on survey data collected for the 2014 and 2016 cropping years.

Conclusions

The continuing need to promote and support participatory irrigation management in Tajikistan calls for more extensive training for the farm managers who are responsible for water delivery through WUAs. Many farmers who were originally trained through WUA interventions have either left the country in search of other work or received only a short period of training. Since more extensive training in water governance stimulates greater participation in WUAs, additional training should be provided to untrained farm managers and reinforced in locations where the original training was of shorter duration. Combining training in water governance with agricultural extension services motivates farmers to diversify their crop production, which promises both environmental and nutritional benefits. Particular attention should be given to training women, who are increasingly responsible for farm management, so they can access the human and financial resources they need to lighten their growing burden of responsibility for both family food security and the *dehkan* farms.

Source

This Water Policy Brief is largely adapted from the following sources:

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 at *Agricultural Water Management.*

Balasubramanya, S.; Buisson, M.-C.; Saikia, P.; MacDonald, K.; Aslamy, S.; Horbulyk, T.; Hannah, C.; Yakubov, M.; Platonov, A. 2016. *Impact of water users associations on water and land productivity, equity and food security in Tajikistan.* Baseline Technical Report. Colombo, Sri Lanka: International Water Management Institute (IWMI). Prepared for the United States Agency for International Development, USAID Grant Number AID-BFS-G-11-00002. Available at https://tinyurl.com/ybrbjqqf (accessed on June 7, 2018).

Balasubramanya, S.; Price, J.P.G.; Horbulyk, T.M. 2018. Impacts 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.

Buisson, M.-C.; Balasubramanya, S. 2018. *The role of water users associations on agricultural production systems and diversification in Tajikistan.* Unpublished.

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Price, J.P.G.; Balasubramanya, S. 2018. The role of the *mahalla* in local water dispute resolution in Tajikistan. Revise and resubmit at *Central Asian Survey.*

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Contact: Dr. Soumya Balasubramanya, IWMI, Colombo, Sri Lanka (s.balasubramanya@cgiar.org)

Front cover photograph: The Head of a Water User Association (WUA) in southern Tajikistan meets cotton farmers to discuss irrigation requirements (*photo*: Neil Palmer/IWMI).

International Water Management Institute (IWMI). 2018. *Strengthening participatory irrigation management in Tajikistan.* Colombo, Sri Lanka: International Water Management Institute (IWMI). 8p. (IWMI Water Policy Brief 41). doi: 10.5337/2018.212

/ participatory management / irrigation management / irrigation systems / water governance / water users associations / training programmes / farmers / farm managers / collective farms / agricultural extension / food security / crop production / women's participation / rural communities / Tajikistan /

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International Water Management Institute (IWMI)
127 Sunil Mawatha, Pelawatte, Battaramulla, Sri Lanka
Mailing Address:
PO Box 2075, Colombo, Sri Lanka
Tel: +94-11 2880000 Fax: +94-11 2786854 E-mail: iwmi@cgiar.org
Web: www.iwmi.org