



Improving Gender Equity in Irrigation: Application of a Tool to Promote Learning and Performance in Malawi and Uzbekistan

Nicole Lefore, Elizabeth Weight and Nozilakhon Mukhamedova

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Nicole Lefore, Elizabeth Weight and Nozilakhon Mukhamedova

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Acknowledgments

The Gender in Irrigation Learning and Improvement Tool (GILIT) was developed and piloted with support from the CGIAR Research Program on Water, Land and Ecosystems (WLE), which is hosted and led by the International Water Management Institute (IWMI). The need for a tool to address gender equity at irrigation scheme and project level arose from consultations of the network for Improved Management of Agricultural Water in Eastern and Southern Africa (IMAWESA), which was funded by the International Fund for Agricultural Development (IFAD).

The authors would like to thank those that contributed through facilitating research in the field. In Uzbekistan, thanks go to Nazar Business and Technology (NBT), Jusipbek Kazbekov (formerly IWMI, Central Asia) and Khurshida Gapirova (consultant) for leading the pilots in Central Asia, as well as to members of the irrigation water users' associations (Alisher Navoi – Suv, Angren Mirob, Jamiyat – Oydin, Yurtim – Istiklol, Amu – Hayrabod and Hujabuston Suv Tarmogi) that participated in the piloting of this tool. In Malawi, thanks go to Wapulumuka Mulwafu (Professor, University of Malawi, Chancellor College), the Agricultural Extension Service, and the farmers participating in the irrigation projects at Kaziputa and Lufilya that assisted us in the piloting of this tool. The authors also acknowledge the support provided by Emelda Tagutanazvo (graduate student intern at IWMI) in conducting the research in Malawi. Thanks also go to Deborah Rubin (consultant) for contributions to early versions of the tool and, finally, to Dr. Eleonora Fayzullaeva (socio-economic and gender expert) for her review of this paper.

The authors also thank those that commented on an earlier draft of this paper presented at the 4th African Regional Conference on Irrigation and Drainage (ARCID) held on April 26-28, 2016, in Aswan, Egypt.

Project

This tool and manual were prepared with the support provided by the *Sustainably Increasing Land and Water Productivity* Flagship of the CGIAR Research Program on Water, Land and Ecosystems (WLE).

Donors

Funding for this research was provided by the following:



This research was carried out as part of the CGIAR Research Program on Water, Land and Ecosystems (WLE) and supported by CGIAR Fund Donors (<http://www.cgiar.org/about-us/ourfunders/>).

Citation

Lefore, N.; Weight, E.; Mukhamedova, N. 2017. *Improving gender equity in irrigation: application of a tool to promote learning and performance in Malawi and Uzbekistan*. Colombo, Sri Lanka: International Water Management Institute (IWMI). CGIAR Research Program on Water, Land and Ecosystems (WLE). 31p. (WLE Research for Development (R4D) Learning Series 6). doi: 10.5337/2017.217

/ research and development / gender equity / learning / training programmes / performance evaluation / women / women's participation / men / irrigation schemes / participation / improvement / assessment / on-farm production / agricultural extension / agricultural production / productivity / water management / water allocation / farmers / market access / investment / community involvement / stakeholders / resource management / decision making / state intervention / Malawi / Uzbekistan /

ISSN 2522-7106 (Print)
ISSN 2522-7076 (Online)
ISBN 978-92-9090-858-6

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Summary

This paper provides a brief synthesis of research conducted on gender in irrigation, and the tools and frameworks used in the past to promote improvement for women in on-farm agricultural water management. It then presents results from the pilot of the Gender in Irrigation Learning and Improvement Tool (GILIT) in locations in Malawi and Uzbekistan in 2015. Through the results of the tool, the paper looks at benefit sharing between men and women farmers: (i) access to irrigation scheme resources (including information, for example, in the design phase; land, water and other inputs); (ii) participation in scheme management; and (iii) access to scheme benefits, including access to market information, packaging and payments. The indicators for the tool were modelled after principles reflected in existing gender policies and strategies, and intended to improve performance at field level in line with national and regional goals. The paper concludes with informal and formal constraints to gender-equitable outcomes from irrigation investments identified during the pilot, and suggests how the tool can be used by various development actors to improve the benefits for women from investments in agricultural water management.



Photo: David Brazier/IWMI

INTRODUCTION

This paper describes the results of research that piloted a practical tool to assess equity in the design and implementation of formal irrigation schemes. The Gender in Irrigation Learning and Improvement Tool (GILIT) was developed through the CGIAR Research Program on Water, Land and Ecosystems (WLE). The research aimed to test whether one set of gender equity indicators could be used across different contexts to assess and improve gender performance in irrigation, such that gender equity at the local level would be better aligned to national and regional aspirations.

Ensuring gender equity in irrigation is important because the level of agricultural productivity of women can be the same as that of men when they have access to the same quality and quantity of agricultural inputs, potentially increasing women's yields by 20-30% above current levels (FAO 2011a: 5). Agricultural water management (AWM) is one of those inputs that can increase agricultural productivity for both women and men, thereby contributing to food security and improving livelihoods. Most governments prioritize the development of new irrigation schemes over the rehabilitation of old ones. At the same time, both governments and development partners acknowledge the centrality of gender in agricultural development goals. Therefore, achieving gender equity in the irrigation sector has become an important development goal.

However, few practical tools and approaches exist to guide interventions in irrigation towards impact. At present,

the United Nations Development Programme (UNDP) provides two indexes in its Human Development Report - the Gender Development Index (GDI) and the Gender Inequality Index (GII) - that measure and then rank gender equity at the national level (UNDP 2015; Berlin et al. 2017). GDI is a composite measure of health, knowledge and living standards at national level, whereas GII measures inequality between women and men with regards to reproductive health, empowerment and economic status at national level. These metrics are intended to permit the monitoring of progress toward gender equity, and to also support policy analysis and advocacy. The scores give an overview of gender relations in each country and enable a general comparison across countries, but reveal little about progress on gender equity in agriculture or water, particularly below the national level. As stated by UNDP, limitations of the GII include that "it does not capture the length and breadth of gender inequality. For example, the use of national parliamentary representation excludes participation at the local government level and elsewhere in the community and public life" (Berlin et al. 2017: 5). Thus, GDI and GII do not capture participation in critical sub-national water decision-making bodies or processes. Indeed, few practical tools and approaches exist that provide sufficiently high-resolution empirical data to assess current performance, guide actions at field or scheme level, and support continued progress monitoring for gender equity in agricultural water management.

GENDER IN IRRIGATION: LIMITED PROGRESS IN ACHIEVING EQUITY FOR WOMEN AND MEN

Researchers in the 1980s and 1990s documented women's contribution to water in domestic and agricultural contexts, e.g., in collecting, consuming and conserving water for crop and livestock production and processing. At the same time, this research gave little attention to gender issues specifically in irrigation schemes. This reflected the relatively small percentage of agricultural land under irrigation - roughly estimated at about 20% worldwide, with wide variation from place to place (World Bank n.d.) - and the underrepresentation of women in irrigated landownership and participation in irrigation scheme management. The scant research on gender and irrigation found that the introduction of formal irrigation schemes typically reinforced men's control of plots and added to women's labor input without corresponding increases in benefits to women, either in income or produce; research documented frequent examples of women's withdrawal of labor in irrigated schemes, resulting in lower scheme-level productivity (in the Gambia: Carney and Watts 1991, and Dey 1981; in Cameroon: Jones 1982, cited in Warner and Hansen 1995; in Sri Lanka: Benson and Emmert 1985; in Nigeria: Jackson 1985).

In more recent years, a significant body of research sought to understand gender issues in AWM and identify gender-based constraints from design (e.g., Merrey and Baviskar 1998; Chancellor et al. 1999a, 1999b; Chancellor and O'Neill 1999a, 1999b; Berejena et al. 1999; Matshalaga 1999) to operations (Chancellor 2000) and evaluation (World Bank, FAO and IFAD 2009). The results of the various research interventions are beyond the scope of this paper, but generally conclude that "gender blind" irrigation scheme design can unintentionally introduce or exacerbate gender disparities in social norms and practices, and even create gender inequalities and new barriers for women (van Koppen 2002; World Bank, FAO and IFAD 2009; FAO 2012). In this case, "gender blind" is the term used to describe approaches to project design and implementation with little or no evidence of performing a gender analysis or considering local gender norms and relations. This contrasts with gender-sensitive and gender-responsive approaches informed by gender analysis. Development researchers and institutions proposed that gender-responsive irrigation scheme design could avoid creating or exacerbating gender

disparities. Gender-responsive design efforts to (i) identify those aspects of men's and women's needs, preferences and resources that are relevant for AWM, and (ii) create appropriate institutional structures to ensure that both men and women have equitable opportunities to participate in the scheme and its management. Advocates for the approach cautioned that, while gender-responsive design could help to avoid creating new gender disparities, it could not guarantee gender equality in scheme operations, since schemes typically reflect "existing social relations in power" which have historically favored men (World Bank 2014). The Gender Performance Indicator for Irrigation emerged from that research to provide a tool for development actors to rate and improve gender performance in irrigation (van Koppen 2002).

Parallel to that research, national and international institutions, policies and regulatory frameworks began to reflect this emphasis on gender in water management, including agricultural uses. An international agreement at the Earth Summit in Rio de Janeiro in 1992 highlighted the need to include women and consider gender-related issues in water. The "Dublin Principles" influenced the integrated water resources management (IWRM) approach, which many countries officially adopted (Global Water Partnership 2017). In addition, 188 countries ratified The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) that includes a

provision relevant to irrigation schemes: "To have access to agricultural credit and loans, marketing facilities, appropriate technology and equal treatment in land and agrarian reform as well as in land resettlement schemes." (UN 1979). In May 2011, the African Ministers' Council on Water (AMCOW) further developed a gender strategy for all member states to pursue, which is applicable to irrigation (AMCOW 2011). Many African countries have also included gender in their irrigation policies. These national and international commitments formed the basis for programs and projects to implement gender-responsive irrigation projects and schemes that seek greater equity.

However, international financial institutions and development banks recognize that it has been difficult to improve the attention given to gender in practice (World Bank, FAO and IFAD 2009: 229). An assessment of the World Bank's Water Resources Strategy (World Bank 2002) found that attention to gender issues in water, although considered in an increasing percentage of projects—from 30% in 1993 to 54% in 2002 (World Bank 2006: 65)—remained "the least effective of all Bank actions in irrigation and drainage" (World Bank 2006: 199). Clearly, the aspirations expressed at the regional and global level were expected to be integrated into policy at national level, but they did not translate into effective implementation of gender-equitable actions in irrigation at the actual field level.

SUPPORTING GENDER EQUITY IN IRRIGATION: THE GENDER IN IRRIGATION LEARNING AND IMPROVEMENT TOOL (GILIT)

Research and development organizations responded to the poor gender results with a number of products aimed at improving the mainstreaming of gender in irrigation. These include tools, guides, checklists, participatory exercises and indicators, which were meant to be used across research from planning to implementation and evaluation stages of the project cycle. These products built on the existing body of research that assessed constraints to gender inclusivity and performance at farm and institutional levels (Rubin et al. 2015). However, project managers and implementers continued to express the need for a way to learn and improve on gender performance within small irrigation schemes and projects, and also to share the status of gender responsiveness with governments and donors.¹ In short, a gap remained for a tool that could be applied within the scope of a scheme or project.

The Gender in Irrigation Learning and Improvement Tool (GILIT) (Lefore et al. 2017) seeks to blend the best practices of previous research, and existing tools and indicators, with the principles promoted through the various regional and global strategies for addressing gender equity in irrigation. GILIT provides the basis for indicators useful to assess

and improve performance at scheme level consistent with national and regional goals on gender equity, even where existing social relations in communities may not be gender equitable. At the same time, the tool targets issues that would be within the control of project or scheme management, thereby aligning field- or scheme-level practices with national and regional policy. In this case, scheme management refers to the multiple levels of organization that are responsible for structuring access to irrigation scheme resources. This includes land, water, technologies, inputs such as labor, fertilizer, pesticides, and market information or marketing services, as well as membership in those organizations. It includes Water Users' Associations (WUAs) and the higher-level councils or boards in which WUAs are represented. It may also include the sections or departments within government ministries that are responsible for interfacing with irrigation schemes.

In brief, the tool focuses on three areas for learning and improvement that research highlighted as key issues influencing levels of equity in irrigation investments. These relate to men's and women's:

¹ This was the conclusion of a learning alliance supported by the network for Improved Management of Agricultural Water in Eastern and Southern Africa (IMAWESA). Participants of the learning alliance identified the need for a mechanism to both improve and monitor the gender responsiveness of irrigation projects in different contexts.

- i. access to irrigation scheme resources (including information, land, water and other inputs);
- ii. participation in scheme management; and
- iii. access to scheme benefits (including market information, packaging and payments from product sales or processing).

The tool provides a section and a set of indicators for each of these three categories that describe conditions that reflect gender equity; each category is accompanied by a section on the gender context. The gender context section provides statements and supporting questions that indicate the level of gender equity in institutions, policies and programs at multiple levels. **Section A** of the tool provides statements related to access to irrigation scheme resources. The statements outline whether association and/or scheme by-laws and other regulations provide men and women with equal access to resources such as land, water, labor and technology. **Section B** addresses opportunities for men and women to participate meaningfully in scheme governance, e.g., to join a scheme,

become members of a scheme's user association, and to hold meaningful positions of leadership within those associations. Finally, the statements in **Section C** address the extent to which irrigation scheme management and/or an associated farmer/producer association offers access to scheme benefits for both men and women in an equitable system, in relation to payments, marketing support, extension services and other forms of assistance. A series of supporting questions enable discussion and reflection, and can be adapted to national goals or context. Participants in the scheme and managers of the scheme discuss and rate their performance, and offer actionable suggestions for improvements. The gender context section is not scored, because it is outside the scope of control of project managers and participants. Scoring for the other sections is based on a weighted scale in which the statements or indicators that are more difficult to achieve are weighted higher than those indicators that are easier to achieve. The tool can be implemented periodically to assess perceived improvement by the scheme or project farmers and managers.

METHODOLOGY

The GILIT research team launched pilot projects in order to examine the relevance, usefulness and applicability of the tool in different contexts. The research was conducted with a diverse range of stakeholders in mind, including irrigation scheme managers, leaders of Water Users' Associations (WUAs), local government officials, private sector entities in the irrigation value chain, credit agencies, and national agricultural research systems

(NARS) and extension programs, as well as donor organizations.

For the purpose of this paper, WUAs will refer to all scheme-level irrigation management associations: in the Malawian context, WUAs are the clubs and groups responsible for scheme management; in Uzbekistan, WUAs refer to the Water Consumers' Associations (WCAs).

SITES

The pilot was implemented on existing irrigation schemes in two countries: Uzbekistan in Central Asia and Malawi in Southern Africa. In Malawi (as shown in Figure 1), researchers selected two irrigation schemes characterized by smallholder farmer participation, donor and public investment, and diverse social contexts of matrilineal (Kaziputa Irrigation Scheme in the Ntcheu District) and patrilineal (Lufilya Irrigation Scheme in the Karonga District) inheritance systems. In Uzbekistan (as shown in Figure 2), the tool was piloted on larger and more formalized irrigation schemes that had public investment and limited donor investment.

and canals from the Kaziputa River to 8 hectares (ha) of land subdivided into very small plots. An overarching WUA manages the infrastructure, including maintenance and repair, as well as the fees collected from water users. The Department of Irrigation deals primarily with the formal WUA on the scheme. The overall scheme is divided into five clubs comprised of 185 farmers practicing irrigation, the majority of whom are women. The clubs decide which crops to grow in the scheme during each season, and it is usually maize intercropped with beans and some vegetables. The inheritance and social structure in the area is primarily matrilineal.

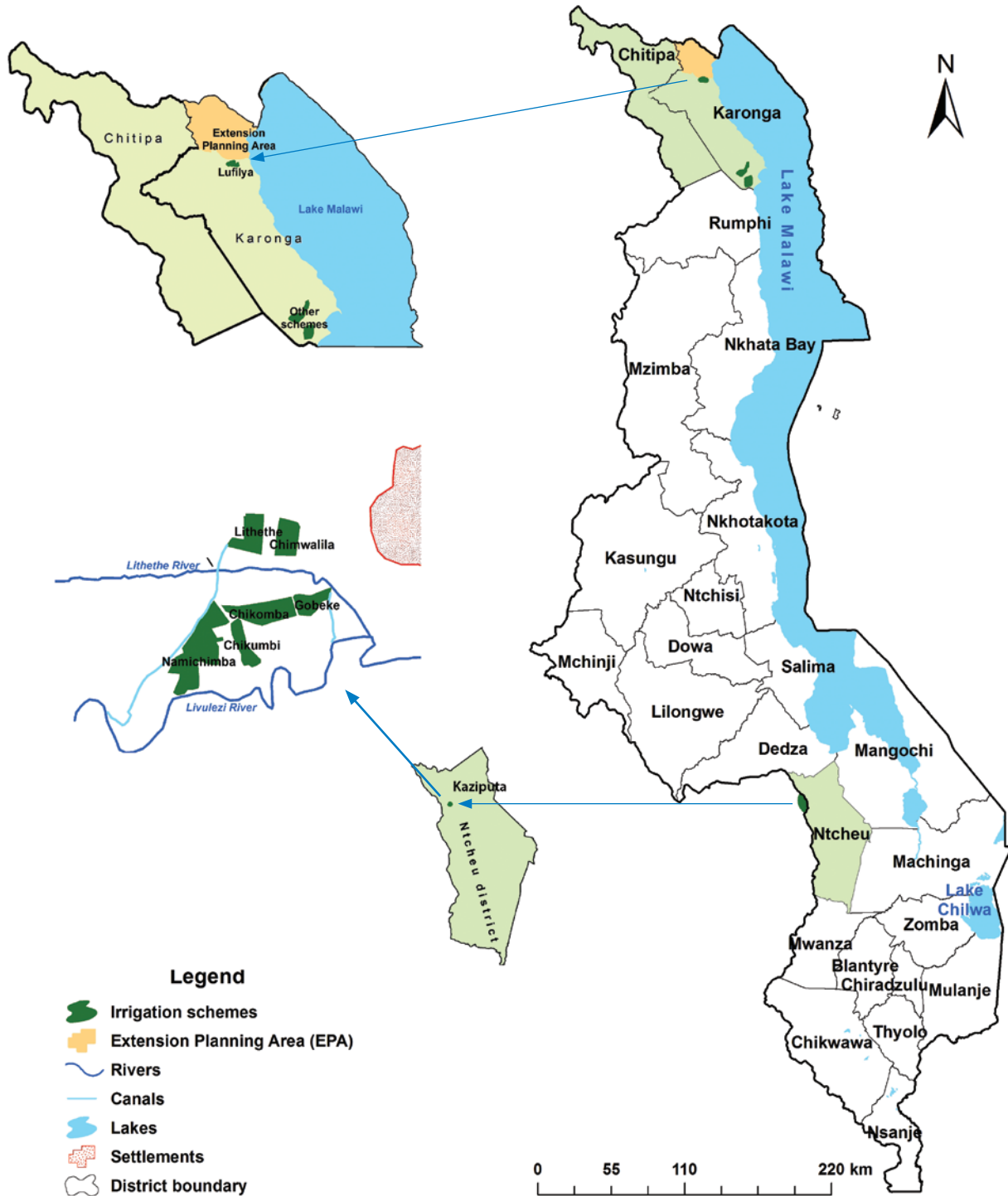
The Kaziputa irrigation scheme began as an informal irrigation site with farmer-led canalization dating back to 1989-1990 when Mozambican refugees were in Ntcheu and introduced the technology (Mloza-Banda 2006). In recent years, the Department of Irrigation upgraded the infrastructure and formalized scheme management with donor support. The system is a series of gravity-fed pipes

Lufilya Rice Irrigation Scheme was established on land that originally belonged to three groups under the Traditional Authority Kilupula. The Malawian government appropriated nearly 1,000 ha of customary land and converted it to leasehold status; hundreds of residents were relocated to nearby villages. The scheme became operational in 1975 and covers a potential area of 600 ha with only 425 ha of

the land currently developed. The average farmer plot size is 0.1 ha. The scheme is gravity fed from the Lufilya River. It was initially settled and run by the Malawi Young Pioneers (MYP) under Spearhead Enterprises, but was then transferred to local farmers in the 1990s. In 2014, the scheme had 1,038 registered members, of which 39 were women. In the 2015 farming year, the figure had increased to about 1,462 members, of which 331 (23%) were women. The scheme has a registered WUA. Farmers produce rice within the scheme; no other crops were reported. The area is predominantly patrilineal.

Since gaining independence from the Soviet Union, Uzbekistan has experienced large-scale privatization of farmland, restructuring of the administration responsible for irrigation and drainage, and the establishment of WUAs. Subsequent land reforms created challenges for irrigation management (Yalcin and Mollinga 2007; Wegerich 2009). State water management organizations, which were formerly responsible for delivering water to collective farm gates, had to deal with an increasing number of individual farmers. The government maintained centralized basin management practices, but transferred

FIGURE 1. MAPS OF PILOT SITES IN MALAWI.



Source: IWMI, based on GPS data from field sites

secondary and tertiary level irrigation management to farmers through WUAs. The government phased in the WUAs (renamed to WCAs in 2009) through pilot projects, and later in 2002, approved establishment of them in all the provinces of Uzbekistan. By 2014, the number of WCAs reached 1,503, covering 3,700,000 ha of irrigated land.

The GILIT research team in Uzbekistan implemented a pilot of the tool in four provinces: Tashkent, Bukhara, Samarkand and Fergana. They selected these regions because they have the highest percentage of irrigated land across the country's 13 regions. Within the identified regions, six irrigation schemes were selected through purposeful sampling. The selected

schemes have an average irrigated area of 2,114 ha, which is representative of the average irrigated area under a WCA command in the country at 2,000-3,000 ha (Zinzani 2015). Further, irrigated cropping patterns of the selected schemes are representative of overall irrigated crop production patterns in Uzbekistan, which is primarily cotton production and then wheat production, followed by fruit and vegetable production (Frenken 2013). Thus, the irrigation schemes selected for the pilot were representative of average irrigation schemes in the country, but varied enough to reveal differences within each scheme and across schemes. The research team invited all available staff members of the WCAs to participate in the focus group discussions (FGDs) on a voluntary basis.

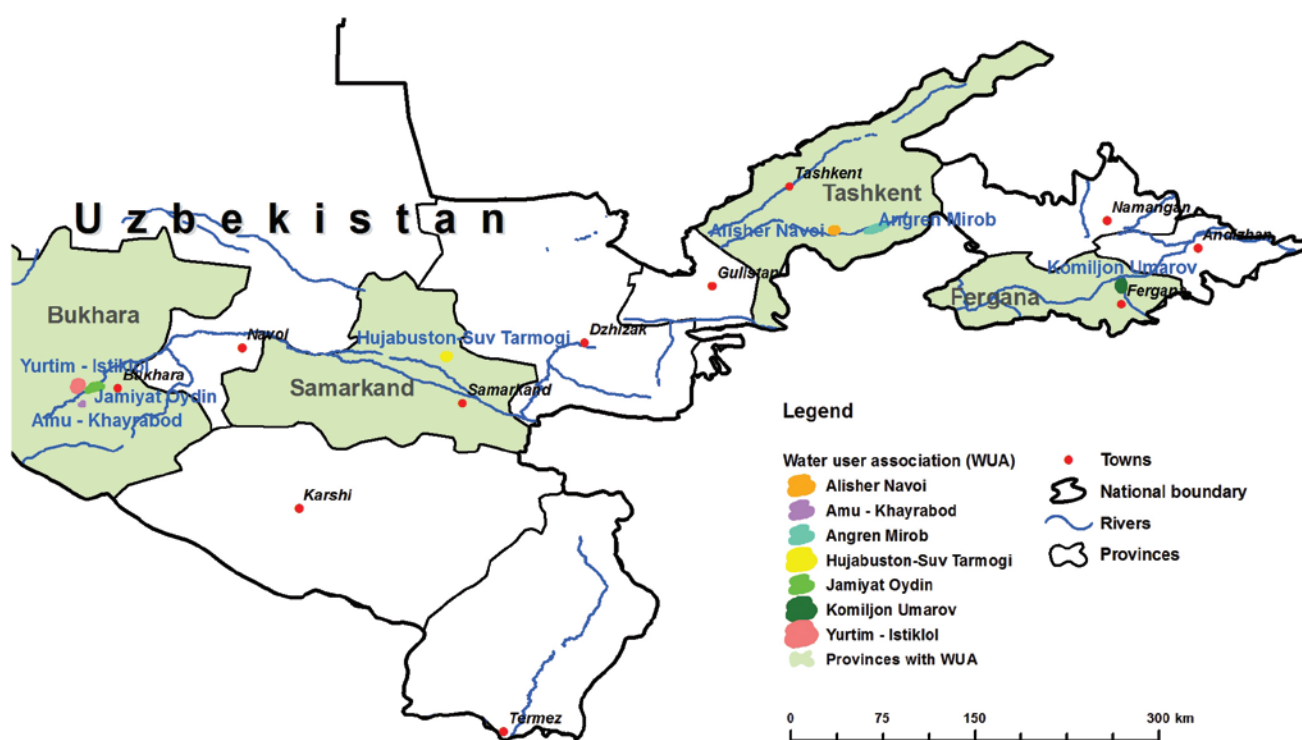
PILOT PROCESS

The process for soliciting responses to the GILIT pilot was similar in Malawi and Uzbekistan. The piloting teams asked every focus group the same standardized questions from GILIT. For each set of questions, respondents scored their response and articulated the reasons for the score. This process provided numeric scores that could be compared and contrasted among respondent groups within the same scheme (i.e., comparing households within the context of scheme management), as well as across schemes in different locations and under different conditions of water variability. The process also provided more detailed

information through the FGDs. This information was helpful to understand the reason for the scoring, and to identify potential solutions to the constraints faced by women and men in each scheme. Focus group responses were documented and analyzed to compare results across irrigation schemes in both countries.

In both Malawi and Uzbekistan, the research teams worked with national consultants, local nongovernmental organizations (NGOs) and extension services to identify representative areas and schemes for the project. They

FIGURE 2. MAP OF PILOT SITES IN UZBEKISTAN.



Source: IWMI, based on GPS data from field sites

contacted the scheme managers to seek permission to pilot the tool, and invited all scheme participants to join FGDs at normal work times to prevent disrupting local schedules. The research teams informed customary and local authorities in each site, in advance, of the FGD; chiefs in Malawi did not participate directly. In preparation for the pilot in Uzbekistan, GILIT was translated into Russian and Uzbek languages, whereas in Malawi, a native speaker

for the geographical area translated tool statements and questions on site. The timeframe for implementation of the tool ranged from 45 minutes to 2.5 hours, depending on the depth of engagement of the group. After implementation, the research team informed the local authorities and stakeholders, including the district irrigation department office in Malawi, about the outcomes and recommended actions that emerged from implementing the tool.

RESPONDENTS IN THE PILOT

Respondents in the pilot were all involved with irrigation schemes, as direct participants, managers or indirectly as providers of support services. The pilot reached 55 respondents in Malawi (Table 1) and 95 respondents in Uzbekistan (Table 2) through FGDs. Participants in Malawi came from the water user groups or clubs—the actual units that manage water in the irrigation scheme—that fall under the broader designation of WUAs. This represented a relatively equal number of men and women in Kaziputa. However, in Lufilya, women’s groups had to be identified in order to reach women farmers and ensure they participate, as they are not as active in scheme clubs or water management.

In Uzbekistan, respondents in the pilot were sought from different levels of scheme management and participation. The pilot included WCA management and operations staff, who were primarily male, and WCA members, who were both male and female. The pilot identified WCA members, who are legal entities registered as “farmers” within the WCA command area. As detailed in the next section of this paper, the state legally recognizes farmers that manage leasehold farms and collective farms, which are predominantly (96%) male owned and managed. So, although the pilot sought to include both men and women farmers and farm managers, the majority of farmers in the FGDs were male. In this paper, the term “farmer” corresponds to this group when discussing results of the pilot in Uzbekistan.

Because of the prevalence of subsistence agriculture in the areas of Uzbekistan where the study took place, the research targeted representatives from households that receive irrigation water from the canals managed by WUAs for household agricultural production. There are no legal water rights for these small-plot household farms (termed “*dehkan* farms”), but a substantial portion of the country’s food is produced on these farms using water from irrigation schemes. Therefore, the pilot included household representatives in order to incorporate their opinions. The households were mostly represented by women. In this paper, “household farms” corresponds to this group.

In sum, the pilot process included strategies to engage female and male farmers, water managers and water users as respondents, who are often not equally represented across water user groups, farmer organizations and water management institutions.

The research also included key informant interviews of national, provincial and local actors involved either indirectly or directly in irrigation and agricultural development. The interviews aimed to outline the gender equity context, but also provide insight into the local situation. Researchers conducted 17 interviews in Malawi and 11 interviews with 13 individuals in Uzbekistan (see Tables 3 and 4).

TABLE 1. RESPONDENTS TO THE TOOL IN MALAWI: IRRIGATION SCHEME FOCUS GROUP DISCUSSIONS.

IRRIGATION SCHEME			MANAGEMENT		FARMERS		HOUSEHOLDS		TOTAL
WUA OR GROUP	PROVINCE	DISTRICT	M	F	M	F	M	F	
(M=MALE, F=FEMALE)									
Kaziputa water user club (all members are farmers, who can hold any position in the water user club)	Central	Ntcheu	0	7	0	2	0	0	9
Kaziputa water user club	Central	Ntcheu	5	0	2	0	0	0	7
Kaziputa water user club	Central	Ntcheu	0	3	0	7	0	0	10
Kaziputa water user club	Central	Ntcheu	1	0	7	0	0	0	8
Lufilya WUA	Northern	Karonga	5	1	0	3	0	0	9
Lufilya farmers – men’s FGD	Northern	Karonga	0	0	5	0	0	0	5
Lufilya Rice Cooperative Village Bank	Northern	Karonga	0	0	0	7	0	0	7
TOTALS			11	11	14	19	0	0	55

TABLE 2. RESPONDENTS TO TOOL IN UZBEKISTAN: IRRIGATION SCHEME FOCUS GROUP DISCUSSIONS.

IRRIGATION SCHEME			IRRIGATED AREA/ MAIN CROP	MANAGEMENT		FARMERS		HOUSEHOLDS		TOTAL
WUA	PROVINCE	DISTRICT		M	F	M	F	M	F	
<i>(M=MALE, F=FEMALE)</i>										
Alisher Navoi	Tashkent	Ohangaran	1,870 ha/wheat	4	1	7	2	0	5	19
Angren Mirob	Tashkent	Angren	2,095 ha/wheat	3	0	2	3	0	6	14
Jamiyat - Oydin	Bukhara	Jondor	2,264 ha/cotton	6	0	8	0	0	4	18
Yurtim - Istiklol	Bukhara	Jondor	2,040 ha/cotton	5	0	7	0	0	7	19
Amu - Khayrabod	Bukhara	Jondor	2,300 ha/cotton	5	0	0	4	0	3	12
Hujabuston Suv Tarmogi	Samarkand	Payarik	3,812 ha/cotton, wheat	5	0	3	1	3	1	13
Komiljon Umarov	Ferghana	Toshlok	3,553 ha/cotton, wheat	0	0	6	0	0	0	6
TOTAL				28	1	33	10	3	26	101

TABLE 3. INTERVIEWS CONDUCTED IN MALAWI.

RESPONDENT	NATIONAL	PROVINCIAL	DISTRICT OR SUB-DISTRICT
District Irrigation Officer, Karonga		X	
Extension and Assistant Irrigation Officer			X
Village Head/Chief			X
Field Extension Officer			X
Water Assistant			X
Assistant District Agricultural Development Officer, Ntcheu			X
Chief, Ganya			X
District Community Development Officer, Ntcheu			X
District Commissioner, Ntcheu			X
District Irrigation Office (4 people), Ntcheu			X
Technical officer, Food and Agriculture Organization of the United Nations (FAO)	X		
Country Representative, UN Women	X		
Agricultural Gender Roles Extension Support Services (AGRESS)	X		
Monitoring and Evaluation (M&E) and Gender Focal Point, Department of Irrigation	X		
Director, Agriculture Extension Service	X		
National Smallholder Farmers Association	X		X
Total Land Care	X		

TABLE 4. INTERVIEWS CONDUCTED IN UZBEKISTAN.

RESPONDENT	NATIONAL	PROVINCIAL	DISTRICT OR SUB-DISTRICT
Ministry of Agriculture and Water Resources, Melioration Department	X		
Interstate Commission for Water Coordination of Central Asia (ICWC)	X and regional		
United Nations Development Programme (UNDP)		X (basin)	
Central Asia Regional Economic Cooperation (CAREC) program	X and regional		
Swiss Agency for Development and Cooperation (SDC)	X		
Nazar Business & Technology (NBT), agricultural consulting firm	X		
Government staff at the provincial level and basin water management level		X	
Fergana Province Basin Irrigation System Authority (BISA)		X	
Syrdarya-Sokh Basin water management		X (basin)	
United States Agency for International Development (USAID)			
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)	X and regional		

RESULTS OF THE PILOT

Situational Context - Malawi

Food production in Malawi is a particularly urgent issue, because 40% of the country's population does not have purchasing power to satisfy daily needs (World Bank 2007). In 2007, as much as 90% of the population lived on less than USD 2 per day and 74% had a daily income of less than USD 1.25 (Government of Malawi 2009). In 2008, 80 to 85% of the population lived in rural areas and derived their livelihood from farming. The European Community Country Strategy Paper (Republic of Malawi - European Community 2013: 8) describes Malawi as “deeply rural” – with a poor road network, and poor physical, economic and social infrastructure.

Of the rural population, 51.7% are women and 48.3% are men, with female-headed households making up 24% of rural households (FAO 2011b). This is significant because the incidence of poverty and ‘ultra poverty’ is higher among female-headed households. Female-headed households have a poverty rate of 58% compared to 51% of those headed by males, and 27% of female-headed households are ultra poor compared to 21% of those headed by males. Female-headed households, on average, earn only 60% of the income of male-headed households. In addition, 94% of women work in subsistence farming compared to 85% of men, and 70% of full-time farmers are women (FAO 2011b).

Women face greater constraints to production through lack of access to assets, resources and services. Women do not have access to benefits such as credit and extension services, as well as technologies and other agricultural inputs. According to Kherallah et al. (2000) and FAO (2011b), credit constraints limit access to fertilizers for female-headed households. Another national study conducted by Gilbert et al. (2002) showed that women achieved the same level of maize yield as men when they have the same level of fertilizer as men.

Improved irrigation systems and intensification techniques would dramatically increase women farmers' productivity and the overall benefit of agricultural production in Malawi in terms of increasing incomes and reducing poverty. The Green Belt Initiative in Malawi seeks to achieve agricultural intensification through irrigation towards increasing overall agricultural production and productivity. According to recent reports, agriculture as a share of total GDP decreased from 40 percent in 2000 to 30 percent in 2011 (FAO 2015), but at least 80% of the population depends on agriculture for their livelihood through smallholder agriculture (Government of Malawi 2005). The World Bank Poverty and Vulnerability Assessment 2007 found that access to irrigation was a major factor affecting household poverty levels (World Bank 2007). Improvements in agriculture could have a considerable impact on livelihoods, particularly through irrigation and intensification.

A new National Irrigation Master Plan and Investment Framework was developed and finalized in 2015 which states that the “specific interests and preferences of female farmers are properly addressed in the WUA affairs.” (Government of Malawi 2015: 30). The aim of the plan was to ensure that 30% of the elected members of the Executive Committee and all of the standing committee are women, and that WUAs should elect at least one woman as an office bearer. In addition, it states that WUAs should form a Women's Affairs Committee to advise the Executive Committee and other committees on issues related to female farmers. It also recommends that 30% of the plots are allocated to female farmers (especially female-headed households), and that one or more plots of the irrigated area are allocated to existing or new women's groups. The same report attempts to address multiple uses of water, notably those for which women are responsible, such as watering animals and doing laundry, though these provisions appear to aim to stop structural damage rather than address water needs equitably.

Malawi faces a number of constraints to actually achieving gender equality, even if it is stated as a goal in official documents, such as the irrigation master plan. Funding remains one of the main constraints to implementing activities that target gender equality and empowerment of women; gender activities receive comparatively little budgetary support from donors (Government of Malawi 2009). Programs conducted by the Ministry of Gender, Children, Disability and Social Welfare are funded entirely by donors, and “gender issues are not taken seriously at central government level, and by senior- and high-level policy makers” (Government of Malawi 2009). Funding for the Ministry of Gender, Children, Disability and Social Welfare was 0.9% of the national budget in 2013/2014, representing an increase from the low of 0.3% in 2009/2010 but a decrease from the high of 2.9% in 2012/2013. The basket fund from donors for gender mainstreaming was also eliminated, though there is a Joint Sector Strategic Plan for Gender, Children, Youth and Sports (2013-2017) that may provide an opportunity for strengthening support again (Government of Malawi 2009). Gender focal points have not been effective in their role in mainstreaming gender across government ministries and departments, being mostly low-level civil servants without clear mandates (Government of Malawi 2009). Nearly all gender functions below national level have been delegated to the Community Development Department without clearly defined responsibilities or coordination. The country has also experienced a loss of progress in regards to gender equality. The poverty rate amongst rural female-headed households increased by 3% (Government of Malawi 2009) between the 2004/2005 and 2010/2011 Integrated Household Surveys (IHSs). This occurred as the human immunodeficiency virus (HIV) prevalence gap between men and women increased

from 3% to 6% between 2004 and 2010 in the 2010 Malawi Demographic and Health Survey.

Malawi ranks at a relatively low 131 out of 187 countries on the GII and 116 out of 187 countries on the GDI in the UNDP Human Development Report (UNDP 2015). The same report showed that only 10.4% of females had some secondary education, which was about half of the 20.4% of males with some secondary education. The estimated gross national income per capita is also lower for women (USD 652) than for men (USD 777). The report of the Law Commission on the development of the Gender Equality Act (2011) cited a 2006 report by Arrehag et al. (2006) that described the situation of women in Malawi to be “a crisis of gender inequality” and went on to observe that “they are disadvantaged in almost every sector of development” (Malawi Law Commission 2011).

This poor performance is in contrast to the various national policies that Malawi has in place to promote gender equality. This includes Malawi’s ratification of CEDAW and the Southern African Development Community (SADC) Declaration on Gender and Development (1997), the Gender Equality Act (2013), the Malawi Growth and Development Strategy, and sector policies that include statements on gender, including agriculture, environment and irrigation. The Ministry of Agriculture and Food Security produced the Agriculture Sector, Gender, HIV and AIDS strategy in 2012. There is also a dedicated Agricultural Gender Roles Extension Support Services section within extension services to specifically target gender issues. These various national institutions provide the regulatory framework and mandate for improving gender-equitable outcomes from agricultural investments. The implementation of programs and projects aimed at ensuring achievement of this outcome currently lag behind attainment of these national goals.

Situational Context - Uzbekistan

According to national official statistics, the poverty rate in Uzbekistan fell from 26% in 2005 to 13.5% in 2015. Over 60% of the country’s 31.8 million inhabitants live in rural areas (State Committee on Statistics, Uzbekistan, July 2016) and 75% of the population living below the poverty line reside in rural areas (World Bank 2016). Yet, the rural agriculture sector provides 23% of the country’s GDP and employs 34% of the population (World Bank 2010).

In order to understand gender roles and equitability in Uzbekistan’s agriculture and irrigation sectors, it is useful to understand the country’s recent agricultural history. During the Soviet era, Uzbekistan’s mandated role within the larger regional economy was as a primary producer, particularly of cotton (Mee 2001). Cotton was produced on large-scale collective farms irrigated with massive transboundary irrigation infrastructure. The country was net food deficient and relied on imports from elsewhere within the Soviet Union to meet food needs (WFP 2008).

Following Uzbekistan’s independence in 1991, approximately 85% of the country’s agriculture continued to be dominated by large-scale (10,000 ha) “collective farms” producing irrigated cotton and wheat (Frenken 2013) under large irrigation schemes—96% of total cropped land is currently irrigated (ADB 2012). The government has maintained control over the central planning system for cotton production (Abdullaev et al. 2009), and irrigation priority is given to farms that produce irrigated cotton and wheat under government orders. In 2003, the Government of Uzbekistan established the WUA as the main community structure for irrigation management (Zavgorodnyaya 2006) and for resolution of disputes among water users (ADB 2014). As noted, the “water and water use” law renamed the WUA to WCA in 2009. The distinction between WUA and WCA was clarified as: “water users” do not affect the amount of available water (e.g., fisheries and hydropower); “water consumers” reduce the amount of available water (i.e., through irrigation) (Frenken 2013: 183-205).

The dissolution of the Soviet Union led to a disruption of food supply, so the Government of Uzbekistan—seeking food self-sufficiency (WFP 2008)—legalized leasehold family farms averaging 25 ha (WFP 2008) and small household plots of approximately 0.2 ha (termed “*dehkan* farms”) (IFAD 2015). While *dehkan* farms occupy only 11.5% of Uzbekistan’s sown area, the country’s 4.7 million *dehkan* farms (IFAD 2015) account for 60% of agricultural output and 75% of food (other than wheat) produced in the country (WFP 2008). Thus, small-plot *dehkan* farms contribute substantially to rural and urban food security (Mukhamedova and Wegerich 2014).

Dehkan farms play an important role in Uzbekistan’s economy and in achieving food security, but there are no legal provisions regarding water distribution to *dehkan* farms. WCAs do not include *dehkan* farm representation. Further, the massive Soviet era transboundary irrigation infrastructure designed for large-farm cotton production does not easily support alternative cropping patterns such as *dehkan* farms (CIA 2017). Uzbekistan’s small-plot irrigation needs, fixed irrigation infrastructure and the legal regulations imposed through the WCAs are not matched to the country’s actual needs. The mismatch contributes to frequent irrigation water conflicts among farming households, farmers and WCAs (Millier and Bellamy 2014). In addition, one of the most widespread activities of rural women is *dehkan* farming (Mukhamedova and Wegerich 2014), with women in rural areas the de facto household-level water managers; women are responsible for irrigating *dehkan* plots, watering livestock, laundry and the provision of drinking water. Therefore, the mismatch in infrastructure, institutions and the absence of legal or customary rights to water for *dehkan* farms primarily impacts female farmers.

The rights and roles of, and benefits to, women in agriculture in Uzbekistan are influenced by the country’s history as well

as cultural norms and expectations. The Soviet Union enacted numerous measures to ensure equal rights and employment for women. These led to the emergence of female professionals and state administrators, as well as an almost 100% literacy rate for women and men (Mee 2001). Following Uzbekistan's independence, the country enshrined equal rights for women and men in its constitution. It also guaranteed gender equality in education, and incorporated non-discrimination clauses and protective privileges for women in its Family Code and Labor Code. Uzbekistan also ratified key international gender equality conventions (Mee 2001). Furthermore, a 1995 decree established a national-level Women's Committee: the Committee chairperson also holds the position of the Deputy Prime Minister for Social Protection of the Family, Maternity and Childhood. At provincial and district levels, there are parallel positions to the national-level Women's Committee. In addition to legal rights and formal mechanisms, a high level of gender parity in access to education and health care has been maintained.

In spite of legal provisions and formal mechanisms that support women's equal rights and roles, the country's customary norms largely shape gender roles and restrict women's access to economic opportunities, and managerial and decision-making positions. The total percentage of women in public institutions is 16.9% and the number of women in parliament was 16% in 2015 (UNDP 2016). Overall employment rates are increasing, but the rate of increase for men is almost double that for women; female employment in all categories decreased between 2007 and 2010. In 2010, 26.8% of low- and mid-level managers

were women; representation of women in top positions is practically non-existent. The estimated gross national income per capita for women (USD 3,811) is approximately half that of men (USD 7,342) (ADB 2014).

Women represent 43% of the estimated 2.7 million economically active population in agriculture, yet post-Soviet land distribution and privatization reforms have resulted in fewer opportunities for women to acquire land-lease rights (Lastarria-Cornhiel and Garcia-Frías 2005). In 2010, women-led farms comprised approximately 4% of the total number of farms. This reduced the number of women represented in WCAs (Stulina 2015): 90% are male; females typically hold administrative positions, e.g., secretaries or cleaners (ADB 2014). Women's labor in the agriculture sector is predominantly in low-paid manual work in cultivation, harvesting and on-farm post-harvesting activities (ADB 2005).

Women have restricted roles in Uzbekistan's agriculture sector, but the sector and women's roles within it are in a state of flux. Post-Soviet agriculture sector reforms have resulted in high unemployment on state farms and high rates of male labor migration (up to 5 million people) (ADB 2014). As a result of rural male out-migration, women are adopting new roles that were recently considered male work domains within the agriculture sector, including irrigation or fertilization (Mukhamedova and Wegerich 2014). Further, recent national-level measures² taken to address gender disparities recommend that project development follow discussion and integration of gender considerations.

GENDER PERFORMANCE IN IRRIGATION SCHEMES: RESULTS OF THE TOOL

Results of the GILIT pilot provided a means to assess the difference between national-level policies and actual performance of gender at the field level in irrigation schemes. It also showed the variation in performance between sites and across country contexts. The statements for each section of the tool are provided in the Annex.

Gender Equality Context

As noted, above, the tool includes a section that aims to outline the situational context in which the scheme is operating. The statements in that section are indicators of a gender-equitable context at local and national levels, and include questions to enable implementers of the tool to assess the actual environment with regards to gender. The statements were not scored, but the results of the interviews are outlined below.

Malawi

The institutional review identified policies, legal instruments and programs that aim to secure equal access for women

and men to certain resources, and also protect women from discrimination. However, national-level aspirations on gender are not always translated into gender relations at the local level. Within this research, 17 interviews were conducted with actors and stakeholders to better understand the policy and institutional context in practice.

Malawi took about 12 years to pass the Gender Act. Even though it is now in place, the Government of Malawi continues to allocate few funds to gender; the Ministry of Gender, Children, Disability and Social Welfare is said to be the lowest funded government ministry. Therefore, most gender 'mainstreaming' activities are supported by donors. The impression of most donors and stakeholders is that there has been a higher awareness on gender over the past couple of decades, but this is amid noted reluctance. District and sub-district agencies have a mandate to promote gender mainstreaming, but the perception is that such programs and projects are not effectively implemented. This is not surprising, as the majority of resources are centrally

²The 2015 "Shadow Report for United Nations Convention on the Elimination of All Forms of Discrimination against Women on Implementation of Article 14", submitted by the Civic Initiatives Support Centre (CISC) and the "Legal Problem Research Center" on behalf of the Republic of Uzbekistan.

controlled and the national government is perceived to underfund gender. Indeed, several respondents stated that the central government may budget for gender mainstreaming, but then do not disburse the funds.

Further, there is a perception that public and civil servants resist gender projects or gender-related activities; civil servants perceive gender to be 'difficult'. In interviews conducted with public institutions, gender activists and departmental focal points with gender responsibilities were often referred to as 'those gender people'. At the Irrigation Department, the gender focal point is allowed up to 30% of work days for gender, most of which is spent in trainings. However, more importantly, the officer described verbal taunting by colleagues because he did not 'just leave it'. Similar ridicule was described at district level for gender focal points across different divisions. In the face of this challenge, donors used HIV/acquired immune deficiency syndrome (AIDS) as an entry point for gender in the agriculture sector. This also became necessary because there is seemingly no link between the Ministry of Gender, Children, Disability and Social Welfare and those ministries responsible for agriculture, water or natural resources. Donors sought indirect ways to link gender into the sector programs. HIV/AIDS became a means to package activities to mainstream and train civil servants on gender, and identify ways to address the observed relationship between cash crop sales, gender-based violence and rights for rural women. However, some non-profit actors stated that using HIV/AIDS as an umbrella for gender programs eventually led to declining resources as the Global Fund to Fight AIDS, Tuberculosis and Malaria reduced support. It is unclear how additional gender mainstreaming in agriculture will be promoted.

The reticence in gender mainstreaming may be related to the perception that it is externally driven. Nearly all respondents stated that gender policy and programs are a donor agenda; only one non-profit organization felt it was not. One institution described 'blaming donors' to get compliance on gender training; project participants and managers accept the donor requirements for gender activities because they are now 'used to it'. A donor organization stated that public institutions' failure to promote gender equality in programs led them to fund projects through customary chiefs, though they acknowledge that chiefs in some areas do not support increased gender equality.

Still, gender mainstreaming efforts largely exclude irrigation and multiple uses of water as part of the gender equity picture. The Agricultural Gender Roles Extension Support Services (AGRESS), which is part of Malawi's extension service, is working on approaches that facilitate household-level dialogue and planning. However, AGRESS noted that most irrigating households are excluded from the dialogues and planning, because these methods target the poorest farmers with little or no assets. At the district level, some civil servants discussed the lack of activities on gender 'fairness'

and benefits with regard to resources such as water and irrigation; they were critical of limiting interventions to women's clubs and village savings organizations. One respondent stated that there would be no initiatives in irrigation related to gender unless brought by a donor or NGO, because "without an NGO there is no training."

The research also sought to assess whether irrigation projects are monitored and evaluated based on gender goals. Most respondents stated that gender may be stated in the goals, but that does not translate into project activities; gender activities in projects are 'tokenistic'. Moreover, respondents stated that gender has not been part of the agriculture or irrigation indicators for which government collects data. Data on the number of female participants in an activity or meeting is usually the only data collected, if any; respondents also stated that this is why many women will be asked to attend only the first meeting of a project. The Irrigation Department stated it intends to collect data on the number of women in leadership positions of WUAs, but at a later, undetermined stage. A small number of donors do see indicators as an entry point for gender activities. Monitoring and evaluation officers interviewed from the Ministry of Agriculture, Irrigation and Water Development noted that donors are insisting on gender-disaggregated data collection, but again, there is strong resistance and it is often just not collected.

The issue of gender-disaggregated data collection points to one of the strongest messages from the respondents: across all sectors, gender mainstreaming is equated with quotas. Several respondents attempted to guess or simply could not explain the reason for the quotas or percentages used in projects. One person interviewed believed that the 'Fourth World Conference on Women' in Beijing, China, in 1995 introduced 30% quotas; a few people thought the government had included specific quota numbers in policies. Typical quotas mentioned for female participation seemed to range from 30% to 50%, though one project mentioned 60%. One staff member from the Ministry of Agriculture, Irrigation and Water Development thought that the Ministry was now targeting 50% women's participation in projects. These numbers are targets, and not necessarily what is achieved. Notably, staffing at the Irrigation Department is only 5% women, though it is a higher 30% in extension. Respondents clearly perceived a link between the quota targets and donor conditions; one stated that 'we are counting on keep getting funding, otherwise we would not bother'.

The quotas only represent the number of women participants, and are not linked to benefits of any irrigation scheme. Respondents generally agreed that women do not see the benefits, as men often collect the produce and sell it at the market themselves, or come and collect the money in cases where wives sell produce at the market. One public official stated that a husband will give a wife a piece of cloth

as a ‘thank you’ for growing the produce. Another noted that women will buy cell phones, but their husbands will take and keep them. The focus on a quota for participants in meetings and not access to scheme resources, decision making or benefits has serious implications. The Irrigation Department put the figure for female participation in some schemes at 70%, which means that large numbers of women provide labor in irrigation projects but do not gain the potential benefit.

The picture was not necessarily better for ensuring that women and men can both access water for multiple uses. The Irrigation Department noted that men submit nearly all applications for water rights. Water rights are also often associated with landownership; husbands control land in patrilineal areas and uncles often control land in matrilineal areas. The Irrigation Department also stated that they make an assessment during planning irrigation schemes to leave a percentage of water in the river or stream so it does not go dry, and this may be used for domestic purposes. The Water Resources Board is mandated to evaluate water availability for both irrigation and domestic purposes, but in practice, there is no assessment of domestic needs for households participating in or situated close to irrigation schemes. Only one respondent could give an example of a multiple-use irrigation system that systematically assessed and secured water for various uses. This appears to be a rare situation. Government respondents consistently stated that irrigation, water and agriculture departments ‘don’t talk to each other’, and even after integrating into one ministry, they continue to hold separate meetings. The District Commissioner of Ntcheu described a number of water conflicts over different uses within schemes, and between schemes and communities; these are generally referred to the local chief even if political actors are involved. At the same time, the government has mandated the crops department to monitor water quality, but there appears to be no attempt to monitor or assess the impact of agrochemicals on water quality, even though it may be affecting the water used for domestic purposes.

The situation for gender and irrigation in Malawi appears bleak, but there are some efforts being made for improvement. At scheme level, district Irrigation and Public Works Departments attempt to ensure some degree of equity on plot allocation and within WUA leadership positions. These bodies have provided gender trainings for WUAs, tools for gender-blind plot allocation, and encouraged meeting times and locations that are more convenient to women farmers. This does appear to be a limited practice and is not an official department policy or approach. Many areas do not have district irrigation officers at all, particularly in the north of Malawi. Informal schemes that are initiated by farmers are not incorporated into any system or linked with the government departments. Respondents suggested that the approach of the district officers varies, with no particular set of tools for strengthening gender equity within irrigation schemes. The

extension service officials interviewed reiterated the issue of lack of consistency. NGOs and private actors ‘contract’ local extension agents to work on their projects and with their farmers, in parallel to their official workloads. Some lead farmers also act as extension agents, but very few women are lead farmers. There are also private extension services offered for certain value chains, notably tobacco. The respondents described a situation of ad hoc and dispersed farming advisors and information providers that overlap with the official extension service, but in general, there is a lack of systematic training on gender and irrigation. Attempts to introduce more short message service (SMS)- and information and communications technology (ICT)-based extension services is constrained because few women have phones or even radios.

In summary, most respondents viewed gender mainstreaming as donor-driven and equated it with target quotas, which were tolerated in order to access donor funding. There are some irrigation schemes where the majority of participants are women, and the district-level Irrigation and Public Works departments have at times provided gender training and tools for more equitability. However, this is not necessarily the case across the country, as departments do not exist in every district and do not take a systematic approach; in other words, extension is uneven and sometimes does not reach women farmers. Generally, the spread of benefits from irrigated agriculture is not perceived to be equal, either in terms of water access for multiple uses or in terms of income. The number of women participating in irrigation schemes does, however, suggest that women farmers perceive opportunities and benefits. Therefore, going to scheme and farmer level is important to get a complete picture of the degree of gender equity locally.

Uzbekistan

Implementing GILIT in Uzbekistan also provided a means to assess the difference between national-level policies and actual performance of gender at the field level in irrigation schemes. In addition to piloting GILIT in Uzbekistan, individual interviews were held with 13 agricultural water management experts (as detailed in Tables 3 and 4 above) and with regional organizations within the country.

The experts confirmed that women are aware of their rights, which are taught in schools and enshrined in Uzbekistan’s constitution, national policies and regulations. However, women’s knowledge of their rights does not translate into equal access to resources, participation and benefits for several reasons. First, experts noted that achieving gender equality will require numerous interrelated and mutually reinforcing actions, rather than disparate projects, laws and regulations. Second, current mechanisms to implement and enforce laws and regulations are weak at all levels and require political will if they are to be implemented effectively. Third, an interviewee noted that technical documents furnished to basin-level water organizations are technical, directive and

focused on engineering (e.g., gate control, discharge rate), and do not provide guidance related to gender inclusivity. Thus, water managers are not equipped with the tools they require to address women's water needs. Finally, legal and regulatory codes do not change underlying cultural and traditional practices and norms or the patriarchal structure of Uzbek families. One respondent noted that, when Uzbekistan was part of the Soviet Union, many women were trained at the irrigation institute and they had a greater role in the water sector, which was prestigious and received substantial financing. With the dissolution of the Soviet Union, water sector financing decreased, which in turn led to inadequate legal enforcement mechanisms, a resurgence of traditional practices and norms, and a decline in women's roles in senior-level decision making.

All interviewees stated that women are responsible for household food security and are the primary managers of small household *dehkan* gardens. One respondent noted that it is easier for water managers to allocate and distribute water to a few larger farms (30 to 50 ha) than to many small household *dehkan* farms. In many irrigation schemes, households are at the middle or the tail end of the water distribution canal; this is reflected in the priorities of the WCAs, who allocate water to household *dehkan* plots only after larger farms receive water. Further, experts stated that quality farmland with irrigation infrastructure has already been allocated to men; if women have been allocated land, it is generally at the tail end of an irrigation scheme or in a highland area. Therefore, they stated that, if irrigation schemes fail or fail to deliver sufficient water, women are more negatively impacted than men. Some interviewees noted that women and their families would be most negatively impacted by irrigation system deterioration due to lack of investment; the same is true of investments in the head end of the system without corresponding investment in the tail end of the system.

Women are not involved in making water-related decisions, according to interviewees, even though women are heavily affected by those decisions. Indeed, a few respondents further stated that different projects have different goals and not all projects have a gender-related goal or component. They seemed to suggest that the purpose of a project should determine whether women and men receive equal benefits from access to water. From the senior government level to WCA level, women do not have professional decision-making

roles at the Ministry of Agriculture and Water Resources or in water research and water quality labs. One respondent stated that, out of 1,500 WCAs in Uzbekistan, there is one female WCA director in Fergana Province. Instead, women work as support staff, e.g., secretaries, administrative assistants, accountants. In addition, one respondent stated that gender equality in agriculture and water management decreases from central level to basin level to WCA to the farm level. At the farm level, public agencies and committees do not view women as farm decision makers; they perceive women's role as "informal" and "supporting" male farmers. Since men are legal owners of houses and legal landowners, women do not have formal decision-making roles in WCAs, which do not consider their needs in water management decisions. Also, since women do not have formal mechanisms to address their water needs, they resort to informal mechanisms, e.g., interacting with female WCA support staff or resolving any issues they face through their male household members or relatives.

Several interviewees noted that WCAs or other agencies invite women into irrigation discussions only to increase the number of women tallied, rather than to provide substantive input into decisions. Several experts noted that counting the number of women who participate in a meeting is not gender equity; rather, gender equity requires changing social and cultural norms.

To address the gender inequalities described by the experts, those interviewed had several suggestions. Interviewees recommended prioritizing household *dehkan* needs in water allocation decisions; to formally recognize the role of women in household *dehkan* farming; and to provide irrigation and agricultural training to women. Further, they recommended that women be officially involved in irrigation management, the WCA council, and Water User Groups. In addition, they explained that addressing gender inequality requires significantly more detailed information, including gender-disaggregated data, than is currently available. Specifically, one interviewee stated that the lack of detailed information below the level of WCAs relating to gender barriers, constraints and opportunities impedes effective gender programming. One interviewee stated that assumptions should not be made regarding women's lack of involvement in irrigation management; rather, detailed information needs to be collected in order to determine underlying reasons for gender disparities.

ACCESS TO SCHEME RESOURCES

Malawi

In Kaziputa, respondents gave their scheme a high score of 27.2 out of 33 possible points. Participants in the discussion noted that women and men had both been consulted in scheme design about most issues. The suggestions of some women had been included and this improved the scheme design: for example, the introduction of a lottery

system that addressed the initial inequality in the location of allocated plots. Both men and women agreed that no public body consulted them about their domestic water needs, but irrigation agencies told them that the government would address domestic water issues separately. All respondents identified problems with non-irrigators using the canals

for domestic purposes, such as washing, but the biggest problem they have is livestock encroaching in schemes and trampling or eating crops. The disciplinary committee, headed by the Village Head that is not on the scheme, is trying to find a solution, and the scheme participants largely felt that fines should be increased and actually enforced. Women also stated that government agencies had not consulted them on their roles for operation and maintenance, but they did not feel their roles had caused them any disadvantage.

Women and men noted a number of constraints preventing women from receiving full benefit from the scheme. Women and men both stated that women are allocated a lower number of plots than men, because they are allocated the number of plots they could effectively cultivate. The number of plots that women “could effectively cultivate” is dependent on their access to inputs, credit and labor. As women cannot claim as much access to credit, inputs and labor as their male counterparts, the number of plots they receive is, therefore, lower. In contrast, the main issue for both men and women related to supplementary support is in overcoming marketing constraints. Men said that women do not want them to control the money because they will take the money to buy beer, but the men said they do not know what the women will take money for. Men felt that the marketing roles are ‘in born’ and cannot be changed. The Department of Irrigation suggested that irrigation schemes form committees on marketing, but it is the first season for this and not everyone was aware of actions taken by the marketing committees so far. There are women on the marketing committees. A fee on the produce from the scheme will cover the costs for the committee to visit markets and get price information. The committee’s objective is to get a higher price by collecting information from various marketing options and taking a joint decision. Men stated that they will still take money for beer, but they are going along with the marketing committee for this year.

The respondents in Lufilya had less knowledge about initial scheme arrangement, so they chose not to score the scheme in the absence of information on planning. Participants were unsure about the planning process that took place in the 1970s, and there was some scheme history known only by the project officer and local village head. Based on those discussions, scheme participants suggested the scheme has undergone different approaches to management since the 1970s but with low participation in decision making from the scheme farmers. At the same time, the statements did generate discussion about urgent issues, similar to discussions in Kaziputa. One such issue is the use of scheme water for domestic purposes. This is formally against the rules but is common, particularly for washing and livestock watering. The villages are supposed to use boreholes for domestic uses and there are committees that are responsible for managing water uses. All the respondents noted tensions and some conflict over water

use between irrigation, domestic uses and livestock, but did not describe current or even proposed actions to address the conflicting uses from the perspective of irrigators. One NGO stated that tensions exist over gendered uses of water, given that women and men are responsible for different uses. However, others say the tensions are not gender-related, but rather between individual farmers or between farmers and livestock owners. Similar to Kaziputa, the other contentious issue was marketing of produce from the scheme. The scheme procures inputs, and women and men farmers are able to obtain the inputs on credit. However, women stated that they feel their culture is a constraint to participation in marketing. They stated that they do more work, but men dominate marketing and take most of the revenue from the scheme. NGOs are now providing training to women, including the establishment of village banks or *Banki Ya Mkhonde*. The village head stated that the NGOs mobilize women’s groups and encourage them to access credit; it was not clear whether this was for inputs to be used on the scheme.

Uzbekistan

As noted earlier, GILIT scores from both WCA management and large-scale farmers were almost identical. The two groups gave all schemes - regardless of location - similar scores, which averaged 18.2 out of 33 for section A. Both groups gave all schemes high scores for explaining the goals, objectives and functioning of the scheme. They gave a score of “0” for questions related to whether women provided input to determine the scheme site location, design and land allocation, and whether the scheme provides credit, insurance and training. They stated that all irrigation schemes were established using a standardized government template, so there is no variation across schemes in regulations, functions of the WCA, etc.

In contrast to scores from WCA management and large-scale farmers, scores from households accessing irrigation water from schemes for *dehkan* gardens, which were in majority represented by women, were consistently lower. In addition, household scores varied across schemes. The Alisher Navoi-Suv WCA in Ahangaran District of Tashkent Province scored the scheme 0 for section A of GILIT, stating that scheme planners did not discuss their water needs, site location, design technologies or land allocation with the community; neither did they explain the scheme’s goals, objectives, costs and benefits. They stated that, “if community interests had been considered during the WCA establishment, households would have received water in their backyards and there would be no problems or water conflicts now.” Excluding the Alisher Navoi-Suv WCA, household producers scored an average of 8 out of 33, explaining that scheme planners met with households and explained the scheme goals, objectives, benefits and costs, which included the requirement for households to provide labor to clean the canals that brought water to the households. Household-level users were not knowledgeable about any other aspect

of scheme establishment, e.g., whether men and women were given opportunities to comment or provide suggestions

relating to site location, land allocation, whether information was collected on men's and women's water needs, etc.

PARTICIPATION IN SCHEME MANAGEMENT

Malawi

Respondents in Kaziputa scored themselves 23.6 out of 24 in terms of scheme performance on equal participation and management. There are no formal constraints or barriers to men or women in terms of participation and leadership. None of the participants own the land, which is leased for each dry season from five local landowners. More women than men manage plots in the scheme. Men stated that more women are part of the scheme, so they have more votes. The government provides training on gender on the scheme after elections, though it had been some years since such a training was held. Elections were expected to be scheduled soon after the pilot for the irrigation clubs and then the umbrella WUA. Men stated that women dominate the scheme already, even though men are also part of the scheme. Women agreed that the irrigation clubs mostly consist of women, but that they are not holding the executive positions. They stated that they should have more representation at the executive level mainly because of their majority status in the scheme. However, men still hold all the executive positions of chairman and vice chairman. Men noted that the chairman has the most power. Men stated that they would accept a woman as chair or vice chair, but they would demand that one of the positions be a man, as a "man must take at least one position." Men and women both agreed that women do not hold the executive positions because the meetings are held far away and women have no transportation. The respondents scored the scheme low on gender equitability in terms of scheme management, and offered a possible solution to improve equitability. Women suggested that the executives be given bicycles to get to meetings and then women would go for those positions that required travel outside the immediate community³.

GILIT enabled discussion and suggestion for a solution that is likely to be implemented, and the discussions revealed underlying social issues around gender relations and how these are reflected in irrigation scheme management. Men stated that women have changed because of the scheme and their roles in the clubs. They said women have become "enlightened" because they have learned from other women to exert more influence over decision making. Men effectively implied that the practices learned from the clubs are then exercised in the household, which, in turn, threatens the existing power relations within the family. Thus, women's empowerment could lead to tensions in the family (though they did not say this was related to access to extension or other training). In turn, women stated that they don't necessarily want executive positions, because

they perceived that men might feel threatened by women taking positions usually held only by men. Therefore, women expressed concerns that taking the higher positions could lead to retaliatory actions by men, e.g., men might refuse to work on plots managed by women. Some women stated that the club leadership positions have given them social status in the community, but also stated that leadership in the scheme only relates to the scheme management and does not cause them to do 'bad things' at home, i.e., threaten the customary roles of men and women in the family. A few women stated that they would like and intend to go for the executive positions regardless of such concerns.

The Lufilya respondents' score of 19 out of 24 reflected more informal constraints to equal participation in scheme management. To begin, the majority of plot owners are effectively men; women are not owners of land and access land only through their husbands. The village head stated that women are considered "strangers" and only access land through their husbands. The village head also stated that he is not aware if this is in line with national laws, but knows that the government "recognizes our culture." The extension office and the project office both stated that men are landowners and women are plot managers. A few plots are rented, but most are farmed by the families that own them and the scheme primarily recognizes the owners (men).

In addition, the scheme formally allows both women and men to vote for WUA leadership and to hold executive positions; that said, many constraints prevent women from voting and holding leadership positions. Men and other respondents stated that elections are not well scheduled for women, because the elections take a full day and women have "chores" that make it difficult for them to participate. Men noted that women often leave before voting begins to attend to their errands. Women stated that they do not know when elections are held, as they are not told. They also stated that they feel that they cannot compete favorably. The recent improvement in the participation of women in leadership on the scheme is largely attributed to interventions by NGOs external to the scheme. There are now a few women on the executive committee and the Board of Trustees; some respondents stated that women still do not have any effective influence. A similar situation prevents women from participating in trainings. The majority of women stated that they still do not feel comfortable speaking at scheme meetings. According to the local culture, women should not speak at meetings where their in-laws are present and are

³ This suggestion has been reported to the Department of Irrigation, which co-manages the scheme funds. They agreed that this is a workable solution and would be discussed further with the clubs and WUA.

not allowed to sit near their fathers-in-law, which creates constraints for women farming in the scheme.

NGOs are providing training to women on leadership in the Lufilya area, particularly working with them on food security and finance (savings and credit). Women stated that they wanted the scheme management to acknowledge that they are capable of being in the leadership positions with equal rights and opportunities. All training on gender and gender-equitable leadership appears to be targeted only at women by the same external NGOs, so it is not influencing the practices of men on the scheme and this create barriers to women's effective participation. In this case, interventions did not address gender in general but only targeted women, which then led to less support for women in other areas and did not contribute to meaningful change in gender relations that would be needed to ensure greater equitability on the irrigation scheme.

Uzbekistan

In relation to participation in scheme management, large-scale farmers and WCA management scored all schemes relatively high, with an average score of 16 out of 24. In all schemes, large-scale farmers may join the WCA if their farmland, which is allocated by the government, falls within the WCA catchment area. In all schemes, large-scale farmers and WCA management stated that large-scale farmers join most meetings, are active members of the WCA, scheme by-laws allow equal voting rights for male and female farmers, and that WCA elections are organized for both male and female farmers to participate. Further, large-scale farmers and WCA management stated that no

farmers contributed to writing scheme by-laws; by-laws are provided as a template by the government. While they did not contribute to writing the by-laws, those by-laws are available and known to all large-scale farmers and WCA management.

Large-scale farmers, WCA management and household *dehkan* producers scored all schemes the same with high scores in relation to respecting their opinions in scheme meetings. Furthermore, both WCA management and *dehkan* producers scored 1 (low) in relation to providing training that enable female and male members (which are only large-scale farmers) to serve effectively in scheme management. With the exception of these two issues, household *dehkan* producers scored schemes lower (an average score of 4 across all schemes) than farmers and WCA management (an average score of 16) for the same schemes. In general, household producers interaction with the WCA was informal and only through the neighborhood "mahalla" representative. Household producers were not knowledgeable on how WCAs operate or any aspect of scheme by-laws, elections or membership rules. In one FGD (Hujabuston Scheme) with household producers, the households stated that they did not know anything about elections because "we are not official farmers."

The one exception to the above was the Hujabuston WCA in Samarkand Province, which was established under a USAID project and allows any irrigation water users, including household producers, to join the WCA. As a result, one household producer is represented on the WCA.

ACCESS TO SCHEME BENEFITS

Malawi

The Kaziputa scheme respondents scored themselves 16.4 out of 21 on performance related to equal benefits. Respondents reported that they had access to water without discrimination related to gender, because they use a lottery system for allocated plots. However, constraints in access to benefits were directly related to information access: men and women both reported that they received most of their information through either the radio or extension service. Women stated that they believe it is difficult for them to access both radios and field day meetings. In the case of radios, only two out of 25 women had a radio. Women without radios stated that they must use an uncle's or neighbor's and not their husband's radio to listen to farm programs at the time of day convenient to them. More than half the men respondents owned radios, but stated that it is part of the men's role to rest, whereas women have chores to do so cannot listen to radios. Women stated that they have to walk about 15 kilometers, which takes 2 hours to reach the demonstration field days that extension services organize to train farmers on new methods. Regardless, a few women do go to field

days; they gave examples of farming practices they learned and applied. Women felt that it would be beneficial to have the agronomic education information reported on the radio for those who could not walk to a field day event. Men use transportation or ride bicycles to field days, but, interestingly, extension respondents felt that men tend not to adopt the new practices shared at field days. Women did not state that they had any cultural constraints to meeting extension agents face to face, but the men stated that women learn better from men and it takes them time to understand something they hear from another woman. In general, women felt they could get more from irrigated cultivation if they could access information and improve their yields.

In Lufilya, the situation was again different from Kaziputa. Lufilya respondents gave themselves a lower score of 11.85 out of 21 on equal access to benefits. Respondents had some disagreement on who is adversely affected if there is insufficient water. Farmers with plots at the tail end are disproportionately affected in water shortages. Men argued

that plots are owned by families and in the names of husbands, and women are not allocated plots at all. They concluded that women could not be disproportionately affected by water shortages at the tail end as they are not allocated plots. Yet, some respondents from NGOs stated that women are disadvantaged in water allocation.

Both men and women felt they do not get adequate access to extension services. Trained lead farmers are the primary source of information. In terms of direct interaction with extension agents and participating in formal trainings such as field days or trainings on the scheme, men reported that women are not allowed to ‘sit on the same chair’ with men, so women should not participate in the face-to-face trainings. Women repeated that they do not feel comfortable speaking at public events, particularly if their fathers-in-law are present. Women also stated that they are not told about trainings, which are held at inconvenient times. They suggested that everyone in the scheme be given a mobile phone so they could all be informed about scheme-related events. The chief stated that all meetings should be organized by him to address the problem, though it is also his role to uphold the customary practices that women reported feeling constrained by.

Women respondents at Lufilya again stated that they feel there is no transparency in marketing. Women and men do not plan together and women do not see the revenue from produce on the plots. There are new local businesses owned by women with which the scheme could engage with as service providers or suppliers, but this is not happening at present. An NGO provides training and credit for women to establish such small businesses, and they stated that the scheme could use the women-owned businesses and services. The men in the scheme stated there are no women-owned businesses that could provide inputs or services to the scheme. Men generally report that women are getting training and credit support from NGOs and suggest there is no need for the scheme to do more for women.

Uzbekistan

In relation to access to scheme benefits, large-scale farmers, WCA management and household *dehkan* producers—with the exception of household producers located in the Alisher

Navoi-Suv WCA in Ahangaran District—gave similar scores across all schemes, averaging 13 out of 21. Participants of the FGDs in all schemes stated that WCAs collect information regarding crops produced by large-scale WCA farmer members to create an irrigation schedule based on crop water requirements and cropped area, without taking gender into consideration. Household *dehkan* producers are not considered to be ‘farmers’, so their irrigation requirements are not included in the WCA irrigation schedules. Participants explained that the majority of large-scale farmers grow state-ordered crops (primarily cotton and wheat), so priority for water is given to large-scale farmers who risk losing their land if they do not produce the required quantity of the state-ordered crop. They stated that water rationing, when necessary, is implemented proportionally among large-scale farmers. All focus groups across schemes agreed that there are no restrictions to women and men communicating with each other and communicating with the WCA.

Focus groups across all schemes except Hujabuston stated that the WCA manages water, but does not provide training or any other services. In Hujabuston, a USAID project provided training to large-scale farmers on farming techniques and also linked farmers to agricultural firms that purchase the produce.

In contrast to the above scores, household *dehkan* producers gave the Alisher Navoi-Suv WCA a score of 5 in relation to scheme benefits. Participants of the FGDs stated that the scheme is located at the tail end of the irrigation system, so there is an insufficient quantity of water. Household producers stated that they do not receive irrigation water because large-scale farmers receive all of the limited quantity of water. This has resulted in continual water conflicts because everyone tries to take as much water as possible. Household producers had heard unofficially from neighbors that they should receive water every Saturday and Sunday, but there was no schedule or clarity regarding water allocation. Households stated that they wanted the neighborhood representative (or *mahalla*) to interact with the WCA to solve these problems. They recommended that the canals be lined to reduce water loss and that the WCA develop a water delivery schedule so that households would know the timing of water delivery to their backyard gardens.

DISCUSSION OF RESULTS OF THE PILOT

Results of the pilot suggest that scheme participants, managers and the public or NGO service providers in different schemes and different regions/contexts tend to score themselves highly, as was expected, but the discussion on constraints also revealed that scoring is sensitive to performance differences. The scores for Malawi are outlined in Table 5 and for Uzbekistan are listed in Table 6. It is interesting to note that men and women within a scheme tended to score the scheme similarly, regardless of

whether their group was the one benefiting or disadvantaged by discriminatory practices. This suggests that women and men, as well as government organizations and NGOs, are aware of the disadvantages and constraints faced by women in the schemes.

Aggregated scores for the sections of GILIT also reflected the intensity of constraints that people faced, and whether scheme participants felt the issues were already being

addressed or if solutions could be implemented through the scheme. The scoring system for the tool appears to accurately reflect the situation in each scheme across the sections and the performance of gender.

The scores given by water users in Malawi reflect the different experiences on gender equity described by irrigation scheme users across the two sites (Table 5). The Lufilya scheme would be considered to adhere to formal institutions and policies with regard to gender equity in activities and rules that are easier to implement, such as formally allowing women to belong to the WUA, vote for executives and stand for election of WUA leadership. However, the results showed that women face informal constraints to participating in scheme management and access to some services, such as information and training. The discussions highlighted how existing gender and social relations can be manifested in irrigation schemes and need to be considered by project designers and managers, and also how local NGOs could offer support to women in the scheme to achieve some benefits for both women and men.

In the Kaziputa scheme, the scores represent higher levels of performance on gender equality. WUA members noted some informal constraints to women's roles in leadership positions, participation in marketing activities and access to information. However, both women and men had begun to address some of the constraints within the scheme, and women had suggestions they felt could easily address other constraints. In this scheme, the Department of Irrigation and the local extension services actively worked with the scheme participants to address gender-related constraints. The Kaziputa scheme falls within a matrilineal area, and irrigation officers and extension agents tended to influence gender relations within the scheme by citing the matrilineal custom, at least as a point of leverage. However, Lufilya is located in a patrilineal area and women stated that they

felt disadvantaged by customary practices. More generally, results of the GILIT pilot suggest that schemes are not gender equitable, which is a concern given the role of women farmers in Malawi's food production. That said, the Kaziputa scheme offers some insights into gender-equitable approaches that could enable women farmers to improve production and incomes.

Similar to the pilot results in Malawi, large-scale farmers and WUA managers (predominately men) within each scheme in Uzbekistan tended to score the scheme similarly (See Table 6). WUA management and large-scale farmers were knowledgeable about WUA by-laws, involved in WUA decision making and benefitted from water allocation from the scheme. Further, the two groups consistently stated that decisions regarding management and delivery were fair and equitable to all, regardless of gender.

In contrast to the scores given by large-scale farmers and WUA managers, household *dehkan* producers in Uzbekistan receiving irrigation water from the same scheme scored the schemes lower across all three sections of GILIT. Given that 96% of household producers in the FGDs were female and 91% of the WUA management and large-scale farmers were male, these lower scores may demonstrate that women are disadvantaged.

WUA management and large-scale farmers in Uzbekistan stated that "gender is irrelevant" because water allocation decisions were made on the basis of crop water requirements. As noted earlier in this paper, "gender blind" or "gender neutral" can unintentionally introduce or exacerbate gender disparities and create new barriers for women. Given that WUA membership is based on land allocation and women in Uzbekistan are underrepresented in landownership, and the share of female farm owners and managers has decreased during farm consolidation, women are largely excluded from

TABLE 5. SCORES GIVEN TO SECTIONS OF THE TOOL BY SCHEMES IN MALAWI.

	LUFILYA	KAZIPUTA
Section A: Access to scheme resources	N/A	27.2
Section B: Participation in scheme management	19	23.6
Section C: Access to scheme benefits	11.85	16.4

Note: N/A = Not available

TABLE 6. SCORES GIVEN TO SECTIONS OF THE TOOL BY SCHEMES IN UZBEKISTAN.

	ALISHER NAVOI-SUV WCA, AHANGARAN DISTRICT		ALL OTHER SCHEMES (AVERAGE)	
	WCA/FARMERS	HOUSEHOLDS	WCA/FARMERS	HOUSEHOLDS
Section A: Access to scheme resources	18	0	18	8
Section B: Participation in scheme management	15	4	16	5
Section C: Access to scheme benefits	12	5	13	13

WCA membership and management. This was reflected in FGDs, in which all 24 WCA managers interviewed were male. They stated that women working in the WCA had administrative positions, e.g., secretaries and accountants. Further, WCA rules prioritize water allocation to farmers that grow state-ordered crops (e.g., cotton, wheat), which results in de-prioritization of water needs for household production.

Discussions with WCA management and large-scale farmers confirmed that the Uzbekistan government's centrally-planned agricultural system determines irrigation sites, scheme designs and land allocation for farm production, and requires farmers to produce specific quantities of specific crops (primarily cotton) on designated land. The discussions also confirmed that the government permits some production of grains, fruits and vegetables in order to alleviate rural poverty and improve food security. However, infrastructure design and institutional modifications to irrigation schemes, as well as WCA management and functioning, do not carry and encourage a gender-responsive approach; thus, those measures do not enable both men and women to have a role within WCA decision making and increase irrigation benefits to households.

It is challenging for the Government of Uzbekistan to retrofit its large and complex irrigation infrastructure in order to support alternative crops and cropping patterns. The same is true for household production plots. This highlights the critical importance of involving both male and female farmers in discussions regarding their water requirements prior to infrastructure design. At present, there is a mismatch between the fixed irrigation infrastructure and the country's irrigation requirements, particularly for small-plot producers. This mismatch, together with gender-biased approaches to water allocation decision making, may negatively impact small-scale, female producers.

Based on opinions of participants of the FGDs, this mismatch negatively impacts women only where there is inadequate water supply. All focus groups across all

schemes in Uzbekistan reported that irrigation priority is given to farms that produce irrigated wheat and cotton under government orders, and there are no legal regulations providing equal proportionate water distribution for household plots/*dehkan* farms. Where water was plentiful, household producers reported that they had adequate water for their backyard production and were uninterested in the structure, functioning or regulations of the WCA. Where there was inadequate water, e.g., the Alisher Navoi-Suv WCA in Ahangaran District, women were disproportionately negatively impacted and wanted to have a role in WCA decision making.

Application of the GILIT suggests that, in locations and/or times of inadequate water, the lack of formal representation of households in the WCAs and the absence of formal mechanisms requiring WCAs to consider irrigation needs for household production can significantly and negatively impact women's ability to produce food for their families. If this is the case, female household producers in Uzbekistan may be more marginalized in the future, given that the Central Asia region is increasingly water stressed and exhibits increasing conflicts over water allocations. The annual internal renewable water resources (IRWR) of less than 1,700 m³/inhabitant is considered to be the threshold below which there are indications of water stress; Uzbekistan's IRWR decreased from 652 m³/inhabitant in 2001 to 589 m³/inhabitant in 2011 (Frenken 2013). Experts expect that the present water scarcity is likely to increase because of increased inter-sectoral demand in the country, development of upstream storage dams and climate change (ADB 2012). Projected changes in the agro-climate, such as increased temperatures and evapotranspiration, pose a "serious risk" to agricultural production, water availability and economic growth for rural livelihoods in Uzbekistan (World Bank 2010: 3). Increasing marginalization of households in times and locations of inadequate water may significantly impact the country's overall food security and GDP, given that small household plots are used to produce approximately 80% of food crops and contribute to 25% of GDP (ADB 2012).

CONCLUSION

Practical tools and approaches such as GILIT can help to improve the design and implementation of irrigation schemes, which in turn could contribute to more equitable, sustainable and effective agricultural programs. One of the few measures available on gender equity is provided by the United Nations Human Development Report through the GDI and GII. According to these measures, Malawi appears to have a much higher level of gender inequality than Uzbekistan. Uzbekistan ranks 114 for the GDI of the UNDP Human Development Report (2015) (the country does not have a GII score or rank due to lack of data). Malawi ranks 116 on the GDI and 131 on the GII. These scores offer some indication of gender-based disparity at national level, but

not necessarily at the local level. The GILIT scores provide a more nuanced, fine-grained understanding of gender disparity in irrigation and agricultural water management. In addition, the GILIT scores provide detailed information regarding the specific disparities (i.e., access to resources, benefits, participation in management) that can serve as the basis for addressing inequality. The results suggest that gender equity in irrigation varies within Malawi with more equity on a smaller scheme in central Malawi than on an older rehabilitated scheme in northern Malawi. The difference appears to be based on contrasting approaches and practices within the schemes, combined with the particular gender dynamic of each social context. In Uzbekistan,

household producers scored schemes lower where water resources were inadequate and suggested that they do not have an equitable role in water allocation decision making.

The pilot also showed that the self-assessment scoring could offer adequate information about gender performance for actors external to the scheme, such as government institutions and other development investors. The results of the GILIT pilot in Malawi and Uzbekistan demonstrated that the numeric score generated from the tool provided the following:

1. A good indication of gender equity/inequity within a scheme.
2. A good indication of the specific areas of equity/inequity (i.e., access to resources, participation in management, and/or access to benefits).
3. A robust score that can be compared across schemes, across contexts and over time to understand trends.

In addition to the numeric scores, detailed input from participants of the FGDs in each context provides valuable insights about those scores. Those insights can be used to develop specific actions based on needs stated by users that improve gender equity in a given irrigation scheme site. The GILIT questions and FGDs served to generate internal discussion and reflection on gender performance. These could also be used to identify potential solutions within the scheme's control that could improve gender equity. Thus, the pilot suggested that the tool may provide one effective option at field level for schemes to learn and improve equity in access to and use of resources for women and men.

Expert stakeholders who were interviewed regarding GILIT stated that the tool provides sufficient, useful and actionable information regarding gender issues and concerns, in addition to identifying gender weaknesses within a scheme. In their opinion, GILIT would be particularly useful for donors supporting irrigation management in the

country, international and local non-profit organizations and their monitoring and evaluation staff, gender consultants, irrigation scheme management, researchers and women's committees in Uzbekistan. They identified the value of GILIT for these entities in several applications:

1. As a first step to gather sufficient information on gender issues as a means to design an irrigation-related project or a gender strategy; to raise awareness of stakeholders on gender issues within a scheme; and/or to develop plans that address issues raised by the application of GILIT.
2. Monitoring to find gaps in perceptions of different stakeholders regarding scheme planning and implementation and/or to determine changes in gender dynamics over time.
3. As a tool for conducting impact assessments for irrigation schemes or development projects related to water.

Suggestions from stakeholders to strengthen and support GILIT in the future included creating an accessible GILIT website that is updated frequently to track gender status and changes at multiple locations over time. Respondents also suggested that a specialist be enlisted to train and support organizations to implement the GILIT, and to train on gender concepts in irrigated agriculture. Training suggestions included providing detailed instructions and examples as well as a video with instructions; providing suggestions on how to adapt GILIT to different organizations and contexts; and supporting interpretation of results.

In summary, the pilot demonstrated that the GILIT was relevant to monitoring and for suggesting approaches to improve performance on gender equity in irrigation schemes across three sets of indicators in different contexts and in different countries. The results of the tool can serve as the basis for strengthening the role of women, and the sharing of benefits between women and men in irrigated schemes for agricultural production.

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ANNEX. STATEMENTS/INDICATORS OF THE TOOL⁴

GENDER EQUITY CONTEXT

Women and men are aware of and knowledgeable about national policies, acts, regulations and goals that prioritize equitable access to resources, participation and benefits between men and women.

The purpose of the scheme/project is to ensure equal benefits for both men and women from access to water.

SECTION A. ACCESS TO SCHEME RESOURCES

Scheme planners met with various stakeholders, including women's groups and potential women participants.

Scheme planners clearly explained scheme goals, objectives, and eligibility and potential costs and benefits to all stakeholders.

Both men and women were included in discussions of options for site location, design and proposed technologies.

Both men and women were given opportunities to comment and provide alternative suggestions relating to site location, design and proposed technologies.

Both men and women were included in discussions of land availability or allocation.

Both men and women were given opportunities to provide alternative suggestions to ensure equal access to irrigated plots of land.

During the scheme or system design process, information was collected on men's and women's different water needs for domestic use.

During the scheme or system design process, information was collected on men's and women's different water needs for agricultural production.

Both men and women were included in discussions of proposed obligations for site operation and maintenance and given opportunities to comment and provide alternative suggestions.

During discussions of obligations for site maintenance, women and men's suggestions for site maintenance were incorporated into operation and maintenance plans.

Scheme management provides supplementary support to men and women to overcome agricultural production and marketing constraints?

SECTION B. ACCESS TO SCHEME MEMBERSHIP, LEADERSHIP OPPORTUNITIES AND DECISION-MAKING

Scheme/association membership is open to both men and women.

Women and men contributed to writing the scheme by-laws.

Association and/or scheme by-laws are available to and known by all members.

Scheme by-laws permit both plots owners and plot managers to be association members.

Scheme by-laws allow equal voting rights for men and women and ensure that elections are organized to allow for both men and women to participate.

Scheme by-laws support women and men to hold positions as association leaders.

The scheme provides training that enables female and male members to serve effectively in scheme management.

Both women and men report feeling that their opinions are respected in scheme association or similar meetings.

SECTION C. ACCESS TO SCHEME BENEFITS

Both women and men are able to receive the amount of water they need, when needed

When water restrictions are put into place, decisions are made in ways that do not discriminate on the basis of sex.

Both women and men receive water on a schedule that is acceptable to them.

Product collection points for bulking, sorting, and grading organized or supported by the scheme are open to both small and large producers, women and men.

Extension advice and price information, among other types of information, are available to both men and women via their preferred communication channels.

Trainings are held at convenient times and in convenient locations to enable both men and women to participate easily.

The scheme management seeks out women-owned businesses, women's groups, and other women entrepreneurs to provide services in the scheme, such as input suppliers, processors, packagers, transporters, and exporters.

⁴ See Lefore et al. 2017.



Photo: Hamish John Appleby/IWMI

About WLE

The **CGIAR Research Program on Water, Land and Ecosystems (WLE)** combines the resources of 11 CGIAR centers, the Food and Agriculture Organization of the United Nations (FAO), the RUAF Foundation, and numerous national, regional and international partners to provide an integrated approach to natural resource management research. WLE promotes a new approach to sustainable intensification in which a healthy functioning ecosystem is seen as a prerequisite to agricultural development, resilience of food systems and human well-being. This program is led by the International Water Management Institute (IWMI) and is supported by CGIAR, a global research partnership for a food-secure future.

About the Research for Development (R4D) Learning Series

The **WLE Research for Development (R4D) Learning Series** is one of the main publication channels of the program. Papers within the series present new thinking, ideas and perspectives from WLE research with a focus on the implications for development and research into use. Papers are based on finalized research or emerging research results. In both instances, papers are peer-reviewed and findings are based on sound scientific evidence and data, though these might be incomplete at the time of publication.

The series features findings from WLE research that emphasizes a healthy functioning ecosystem as being a prerequisite to sustainable intensification, resilience of food systems and human well-being. The series brings together multi-disciplinary research, global synthesis and findings that have implications for development practitioners and decision makers at various levels.

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R4
Learning Series **D**

ISSN 2522-7106 (Print)
ISSN 2522-7076 (Online)
ISBN 978-92-9090-858-6

IN PARTNERSHIP WITH:

