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"If you have money, you have water": Intersectional influences on women's participation in irrigation management in Batken, Kyrgyzstan

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**“If you have money, you have water”: Intersectional influences on women’s
participation in irrigation management in Batken, Kyrgyzstan**

by

Rebecca Nixon

A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degrees of

MASTER OF COMMUNITY AND REGIONAL PLANNING
MASTER OF SCIENCE

Co-majors: Community and Regional Planning; Sustainable Agriculture

Program of Study Committee:
Francis Owusu, Major Professor
Ann Oberhauser
Richard Schultz

The student author and the program of study committee are solely responsible for the content of this thesis. The Graduate College will ensure this thesis is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University

Ames, Iowa

2017

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DEDICATION

For my mom and dad, who always welcome me home, wherever that may be.

And for my Heavenly Father, who holds all things together.

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ABSTRACT

Participatory processes have been widely promoted within the field of natural resource management as a method to support efficient resource use. As women are often key stakeholders in natural resource use, the importance of their inclusion in these initiatives has also been stressed. Specifically, research has shown that women's participation positively impacts outcomes of development initiatives and can transform gendered hierarchies by empowering women in community decision making. However, participatory initiatives are not necessarily inclusive; rather, it has been shown that these processes can exacerbate existing inequalities and specifically, that women can be excluded from participation.

In Kyrgyzstan, participation in irrigation management is organized through Water User Associations (WUAs), or groups of water users responsible for the allocation, scheduling, and delivery of irrigation water. Women make up a small percentage of the members and leaders in these WUAs; however, they are active in agriculture within Kyrgyzstan. Therefore, as irrigation water is vital to livelihoods in agricultural communities, it is important to examine the nature of women's participation in WUAs.

This study draws upon interviews with WUA officials, village leaders, and female farmers in five communities in southern Kyrgyzstan to explore women's access to information and participation in WUAs. Based on the analysis, this study reveals that in addition to gender, personal characteristics such as class and age, as well as geographical location can limit women's access to information and exclude them from membership and leadership. However, women are also strategic in how they choose to participate. These findings suggest the need to reassess the participatory process in WUAs in order to increase inclusion and demonstrates gendered participation in natural resource management.

CHAPTER 1

INTRODUCTION

According to the 2006 United Nations Human Development Report, “water security in agriculture pervades all aspects of human development” (UNDP, 2006, p.174). Around the world on smallholder farms, access to a reliable source of water is necessary for food production that serves both as a source of income and nutrition for the household. In order to manage this vital resource in many countries, participatory processes have become common practices in water management (Harris, 2009; UNDP, 2006). As women are known to be key stakeholders in agriculture and water use (UNDP, 2006) it follows that they have a vital role in this community participation.

Despite women’s role in agriculture and natural resource use, informal and formal rules often hinder their participation in community management. Many face a number of barriers to participation in public meetings, including meetings regarding natural resources such as irrigation water (UNDP, 2006). As a result, women’s participation in community managed natural resources tend to be disproportionate to their male counterparts (Agarwal, 2001; Cornwall, 2000) and initiatives intended to promote community decision making processes have been criticized for supporting the status quo of gendered inequality, enabling existing power structures, and exacerbating exclusions (Cornwall, 2000; Meinzen-Dick & Zwartveen, 1998; Sultana, 2009).

Initiatives that do include women in the management of natural resources are known to promote a number of benefits for the community. For example, increasing their formal participation in decision making can increase women’s water security and strengthen their status

as legitimate water users in the community (Meinzen-Dick & Zwarteveen, 1998). In places around the world where gendered hierarchies dictate inclusion in community decision making, their participation also has the potential to transform power structures by giving women voice in community decision making (Cornwall, 2003). It has been further argued that women's input improves the sustainability and efficiency of development initiatives (Agrawal, 1997) and that their participation increases their adherence to natural resource use regulations (Zwarteveen & Neupane, 1996).

In the case of irrigation management, formal participation and regulation often occurs in the context of water user associations (WUAs) (UNDP, 2006). These associations are groups of water users from one or more hydrological sub-systems who organize the operation and maintenance of an irrigation system. This includes managing financial, technical, and human resources associated with water distribution in their community and thus increases water users' authority in and responsibility for water management. Benefits of WUAs include a more equitable and reliable water distribution, promptly resolved conflicts, and well maintained infrastructure (IWMI, 2003; UNDP, 2006). As water resources are forecasted to become increasingly stressed, efficient management is vital to sustainable management of this vital resource. Additionally, in a world in which it is estimated that two-thirds of the food in developing countries is produced by women (UNDP, 2006), promoting their participation in WUAs not only improves efficiency through increasing their adherence to irrigation regulations but also supports water security by ensuring that they have a voice in irrigation management and decision making in their community.

Among the many countries that have implemented WUAs as the governing body tasked with the operation and maintenance of the irrigation system is the Central Asian nation of

Kyrgyzstan. Agriculture is the largest sector of employment for both men and women in Kyrgyzstan and 80% of the cultivated land (1.02 million ha) relies on irrigation water. The remaining 20%, mainly near the mountains, is rain fed (FAO, 2016), but for the majority of the farmers in Kyrgyzstan, their agricultural productivity is dependent on irrigation water. This makes access to irrigation water vital for the livelihoods of the vast majority of farmers within the country.

In Kyrgyzstan, 50% of all employed women and 68% of all employed men in Kyrgyzstan are working in agriculture (Population and Housing Census of the Kyrgyz Republic, 2009). The share of women has increased over the past decade in part due to male employment opportunities in other sectors and the migration of men out of rural areas and into urban areas (FAO, 2016). Specifically, it is estimated that 20% of the Kyrgyz population is working abroad, predominantly in Russia and Kazakhstan. Young, male migrants make up a majority of this group: of the migrants to Russia, 65% of them are under 30 years old and 62% of those under 30 are male (Sultanov, 2015) and this does not include the many internal migrants who move to urban centers within the country. This out-migration of men leaves women with increasing responsibilities and opportunities in what were once male dominated spheres such as agriculture and more specifically, in irrigation. This significant involvement in agriculture, as well the reliance on irrigation in agriculture in Kyrgyzstan illustrates that access to irrigation water is vital to many women's livelihoods within this country. Therefore, it would follow that women should have a role in irrigation management and decision making in Kyrgyzstan.

Water User Associations in Kyrgyzstan

In the years following independence from the Soviet Union and as a part of the transition from communal ownership of resources to private ownership, the Kyrgyz government issued various policies to organize and regulate on-farm irrigation systems. First, in 1994 the government issued “*Measures to Maintain and Finance Public Irrigation Infrastructure*” which gave the responsibilities of on-farm irrigation to existing village councils. At this point in time, there was no payment system in place for irrigation water, as was the case during the Soviet era (Alymbaeva, 2004). In 1995, four years after independence, the Parliament passed the Water Code, marking the implementation of irrigation services fees (ISFs) in the Kyrgyz Republic. That year the government also issued the first resolution to establish WUAs to organize the operation and management of the irrigation system. This statute described the functions of WUAs and, reflecting the influence of the centralized Soviet government, established a top down management style that suppressed farmer participation in decision making (Alymbaeva, 2004). Still, it represents a change from centralized policies to community decision making, and from communal resources subsidized by the government to the payment for irrigation services. This resolution was amended in 1997 with several changes to address water conflicts, fees, and the rights of farmers (Alymbaeva, 2004).

In 2002, the WUA law was amended again to become the present law that identifies WUAs as non-commercial organizations and establishes the current roles and functions of WUAs. In contrast to the previous laws, the 2002 Water Law promotes the participation of farmers in decision making processes, transparency in finances, and open access to information. It outlines the members’ rights to participate in setting water fees, electing council members, and approving budgets and work plans (Water Law, 2002). In addition to the rights of members, it

also outlines their responsibility to pay ISFs in a timely manner and irrigate according to the WUA schedule (Water Law, 2002). While these policies do support farmers' participation, the Water Law fails to address gender issues in water management.

As of 2011, there were 478 registered WUAs throughout the country, covering about 72% of the country's irrigated land (ABD, 2013). As of 2009, there were over 166,000 members in WUAs (Abdullaev et al., 2009). It has been reported, however, that these registered associations vary in functionality and capacity. There are examples of improved irrigation timing and fee collection in Central Asia through WUAs (Abdullaev et al., 2006) but their efficiency and financial sustainability have been questioned (Abdullaev et al., 2009; Sehring, 2005). Problems that include farmers' inability or unwillingness to pay water fees, infrastructure deterioration, and lack of institutional and technical support impact the extent to which these institutions are able to function effectively (Abdullaev, et al., 2009; Nizamedinkhodjayeva, 2007; Sehring, 2005). Further, it is argued that the legacy of centralized Soviet policies has had a strong impact on the functions of and participation in WUAs (Sehring, 2009; Wegerich, 2000). Specifically, the WUA leadership structure and top down approach that reflects the Soviet management style are uncondusive to the participatory process (Wegerich, 2000).

Despite argued inefficiencies, WUAs remain the nationally recognized administrative body responsible for managing irrigation water at the community level in Kyrgyzstan. Their decisions directly affect farmers' water use through setting irrigation fees, distributing water, maintaining infrastructure, and resolving conflicts. These decisions and actions influence the affordability and delivery of irrigation water necessary for agriculture production. Therefore, promoting information access, membership, and leadership in these associations for all farmers, including women, is key to promoting efficient and equitable water use and decision making.

However, despite their role in agriculture, women's participation in WUAs in Kyrgyzstan is limited. Specific gender disaggregated data on WUAs is non-existent or difficult to access, but it is estimated that in 2009, only 18% of WUA members were women (FAO, 2016). This low membership contrasted with their participation in agriculture calls for an examination of the factors that influence women's access to information and participation in WUAs.

Objective and Research Questions

The objective of this research is to first explore the historical, regional, and local context of WUAs in Batken, Kyrgyzstan, including their purpose, leadership structures, and roles in the community. It will examine the influence of historical Soviet policies on WUA's functions and perceptions of participation in WUAs. While work has been done on the Soviet impact on community water governance (Sehring, 2009), this study will add to the understanding of how the Soviet legacy has influenced individual farmers' participation in WUAs as well as how this history has impacted the functions of these associations. These contextual factors impact participation and water in the research area and are thus included in a study on gender in order to establish the broader situation in which women's participation and water use occurs.

Second, this research will explore women's participation in WUAs to assess the ways female farmers are included or excluded from the participatory processes within WUAs. The existing critiques of participatory development and WUAs juxtaposed with the potential of WUAs to promote inclusion and equity prompts a consideration of these associations' functions and the nature of women's participation within WUAs. Studies have focused on women's membership and leadership in WUAs in Central Asia (Abdullaev & Yakubov, 2004; Stulina, 2015) but little work has been done that includes women who are irrigating as users outside of the WUA or the determinants of their participation. Further, this study provides specific

information on southern Kyrgyzstan and the unique factors in this geographical location.

Broadly, considering WUAs in Kyrgyzstan through a lens of feminism and development theory adds to the understanding of intersectionality, participation in natural resource management, and assesses inclusion in participatory processes of the WUAs. Specifically, this research seeks to answer the following questions:

1. What are the roles and functions of WUAs?
 - a. Who leads WUAs and what are their responsibilities?
 - b. How has the transition from centralized management to independent water management impacted functions of and participation in WUAs?
2. What is the nature of women's participation in WUAs?
 - a. Which women have access to information about the WUA?
 - b. How do women participate in WUAs (e.g. users, members, leaders)?
 - c. What impacts women's access to information and participation?

Methodology

Overview of study area

According the FAO, 93% of the water withdrawn annually in Kyrgyzstan is by the agricultural sector and 1,021,400 hectares, or 80% of the cultivated area, is irrigated in the country (FAO, 2012). Of the total irrigation water, 80% is from diverted rivers, 13% is from reservoirs, 6% from pumping rivers, and 1% of irrigation is from ground water. Less than 1% of the irrigation uses sprinklers with the vast majority utilizing surface irrigation (FAO, 2012). The main crops in these irrigated areas in Kyrgyzstan are wheat, barley, maize, potatoes, cotton, and fodder (FAO, 2012). However, in the southern region of the country, apricots are the predominant agricultural product.

Batken is the southernmost oblast¹ in Kyrgyzstan, sharing borders with Uzbekistan and Tajikistan. It consists of three districts: Kadamjai, Batken district and Leilek. In this oblast, 68% of the employed population works in agriculture (Population and Housing Census of the Kyrgyz Republic, 2009). As of 2010, there were 32 registered WUAs in Batken oblast serving 82% of the 57,000 ha of irrigated land (ADB, 2013). Average farm size in this region of the country is 1.7 ha (ADB, 2013). As shown below, the research area is majority Kyrgyz though its proximity to the borders does support Tajik and Uzbeks living in the area.

Table 1: Research Area Demographics		
	Kyrgyzstan	Batken Oblast
Population		
Total Population	5,362,793	428,636
Male	2,645,921	218,086
Female	2,716,872	210,550
Average size of household	4.7	5.3
Ethnicity		
Kyrgyz	71%	76%
Uzbek	14%	15%
Russian	8%	1%
Tajik	1%	7%
Tatar	1%	0.4%
Uyghur	1%	0.1%
Kazakh	1%	0%
Other	4%	1%
Education		
Primary education completion rate	93.9%	97.8%
Employment		
% of employed population in agriculture	50%	68%

Source: Population and Housing Census of the Kyrgyz Republic, 2009

¹ Kyrgyzstan is divided into seven administrative areas, or oblasts. Batken oblast contains the district of Batken as well as the city of Batken. In order to distinguish each area, this paper will specify oblast, district, or city.



Figure 1: Map of Kyrgyzstan highlighting Batken *oblast*
 Source: University of Texas, 2005



Figure 2: Map of Batken *oblast* showing research sites and water sources
 Source: University of Texas, 2005

- Key**
- Kadamjai
 - Doctuk
 - Batken city
 - Kyzyl-bel
 - Bvium

Data collection

Data collection for this research occurred between April and July of 2016 in five WUA service areas throughout the oblast: Doctuk in Leilek district, Kadamjai city in Kadamjai district, and Byjum, Kyzyl-bel and Batken city in Batken district (see Figure 2). These five locations were selected to capture the diversity in the oblast. Among the study areas, Doctuk is the farthest from any major cities in Kyrgyzstan. It is located on the border with Tajikistan and receives its irrigation water from Kayrakkum reservoir in Tajikistan. Byjum, Kyzyl-bel, and Batken city use irrigation water from the Tortgul reservoir within Kyrgyzstan's borders. Batken city is the capital of the oblast. Kadamjai city is closest geographically to Osh, the major city in the south of Kyrgyzstan, and receives irrigation water from the Aksu River.

Table 2: Interviews Conducted

	Total	Batken city	Byjum	Kyzyl-bel	Kadamjai city	Doctuk
Male Officials	9	2 (WUA chief accountant and city quarter leader)	2 (WUA director and village head)	1 (WUA director)	3 (WUA director, <i>RayVodKhoz</i> director and accountant)	1 (WUA hydro-technician)
Female Officials	2	1 (WUA Director)	0	1 (WUA council member)	0	0
Female Farmers	49	4	13	18	3	11

Purposive sampling was employed to identify respondents. In this sampling method, participants are chosen based on specific characteristics such as socio-demographic characteristics, roles, or experiences (Ritchie et al., 2014). For this study, participants were chosen for similarity in gender (female), occupation (agriculture), location (in one of the three

research areas) and variety in marital status, range of participation in a WUA, age, ethnicity and location of their field to reflect the diversity in the area. Farmers were contacted through gatekeepers² in the community. Officials were chosen based on their location and role in the community and were contacted with an introduction by my host organization, the Tian Shan Policy Center (TSPC)³. In all, respondents included 49 female farmers, nine WUA staff, and two government officials in these districts (see Table 2).

While using gatekeepers has been questioned due to the bias that they bring by excluding certain groups or individuals from participating, it is also seen as an effective way to develop connections with individuals. Further, gatekeepers' knowledge of participants can inform appropriate communication when working with marginalized communities such as women in a largely patriarchal society (Ritchie et al., 2014) and in cross cultural research performed by an outsider, gatekeepers provide necessary connections and introductions to the community (Liamputtong, 2010). In this student, gatekeepers' knowledge of the community as well as their association with a university created their own biases but they were instructed to select participations based on the criteria above. In order to avoid bias from within WUAs, gatekeepers connected to the associations were not used.

This study used semi-structured in-depth interviews to gather data from officials and farmers. This interview type promotes flexibility to explore the participants' responses while maintaining the structure needed to address key questions and topics (Ritchie et al., 2014).

² A total of three gatekeepers were used in this study. Each was a student at AUCA but were originally from each of the areas. One was from Doctuk, one from Kadamjai city and one from Batken city. The gatekeeper from Batken city was used in Byjum and Kyzyl-bel due to their close proximity to each other. Each gatekeeper's first language was Kyrgyz but they also spoke advanced or fluent Russian and English.

³ TSPC, housed at the American University of Central Asia (AUCA) in Bishkek is a "nonprofit, public interest organization focused on research, analysis, and implementation of appropriate and effective public policy in the nations and communities of Central Asia" (<https://auca.kg/en/tspcabout/>). Their research focuses on good governance, human rights, sustainable development, and migration and social protection.

Further, it focuses on participants' expressions of experiences and emotions in their own words (Liamputtong, 2010). This method was utilized to discover participants' experiences and beliefs surrounding water management and WUAs from the governmental, WUA official, and female farmer perspective. In particular, this approach allowed women living in a patriarchal society the space to voice their opinions and the opportunity to shape the interview according to their values and experiences.

Interviews with participants were conducted at the location and time of their choice. Most frequently, interviews with WUA leaders and village leaders were conducted in offices or officials' homes. Topics included their role in the WUA, structure and functions of the WUA, male and female farmer participation, as well as successes and challenges of water management in their service area. Farmer interviews were conducted in a variety of locations including homes, courtyards and farm fields. Questions focused on family background and demographics, agricultural activities, water access, irrigation management, WUA information and knowledge, and participation in the WUA (see Appendix A for interview guides). All interviews were conducted in Kyrgyz, translated into English by the research assistant, and audio recorded with consent from the respondent.

As language is a fundamental tool of qualitative research, the translation process can be especially complex and problematic. Translators have a significant influence on the data as they interpret, clarify, disregard, filter, or miscommunicate language (Liamputtong, 2010). Further, language is embedded in culture; therefore, words and phrases can lose their true meaning when translated into another language and translations can create inaccuracies and misunderstanding of meanings even when the literal translation is correct (Liamputtong, 2010). In this research, interviews were translated into English during the interview process by the research assistant.

The recordings were later listened to and re-translated into English to check for accuracy. The English was then transcribed verbatim. These translation processes were conducted by the same research assistant and myself, creating a bias of her singular translation of the interview. However, my basic knowledge of the Kyrgyz language allowed me confirm or question translations when necessary and she often consulted colleagues if there was confusion about a translation. Additionally, the use of one research assistant, as Adamson and Donovan (2002) suggest, provides continuity in methods and a deeper involvement in the research process. In this situation, the continuity of one research assistant also provided opportunity to build trust in our work and allowed her to provide locally based input on methodology.

Data analysis

Descriptive statistics were used to identify basic trends among participants' socioeconomic characteristics, land use and ownership, and WUA participation. This allowed for analyzation by demographic data. Grounded theory was then used to report patterns and topics in the qualitative data based on themes that emerged from the data by coding, sorting, and interpreting the coded data (Ritchie et al., 2014). An initial thematic framework was constructed based on topics in the interview guide, a familiarization of the transcribed interviews, and the themes that emerged from the analysis of the descriptive data. Nvivo was used to code the interview data into categories by frequency of appearance in both farmers' and officials' interviews. This resulted in 23 categories, which were then sorted into the following themes:

1. Information access
2. WUA meeting attendance
3. Participation in WUA meetings
4. Cost of ISFs

5. Interaction with WUA officials
6. Leadership in WUAs
7. Gender roles
8. Perceptions of WUA
9. Decision making processes

In order to assess access to information, inclusion, and participation, clear definitions were needed to evaluate participation consistently throughout analysis. For this research, access to information is defined as the absence of barriers to the respondents' ability to gain relevant and understandable information that can be converted into knowledge for the water user. It is operationalized through the following questions and appropriate follow up questions in the interview:

1. Who is responsible for irrigation water in your community?
2. Have you heard about the WUA?
3. What are the irrigation water use regulations in your community?
4. What are your rights as a water user?
5. Who do you go to with issues about water in your community?
6. How do you find out about WUA meetings?

Inclusion is defined as the ability to participate in the WUA and choice is defined as the users' own decision to participate or not in the WUA. These are operationalized through the following questions:

1. Do you attend WUA's general meetings? Why/why not?
2. Have you ever attended WUA meetings? Why did you stop/why do you continue?

Participation is defined as acting as a user, members, or leader in the WUA. Leaders are individuals who hold official positions in a WUA; members are self-identifying paying participators in WUA meetings, and users do not participate in the management and decision making in a WUA but utilize irrigation water. It is operationalized in the answers to the following questions in addition to appropriate follow up questions in each interview:

1. Do you use irrigation water?
2. Are you a member of the WUA?
3. Do you participate in WUA council leadership, act as a deputy, work as a myrab, or lead in another capacity?
4. Do you/how do you pay ISFs?

While the methodology was influenced by input from the TSPC and the research assistant, the cross-cultural nature of this study creates specific challenges that may have influenced the research process and results. These impacts are discussed below in order to provide specific context to the cross-cultural nature of this study and to present the steps that were taken to address some of the implications.

Cross Cultural Research: Considerations and Implications

It has been argued that the way in which research participants “place” or “position” the researcher can have a significant impact on the data collection process (Liamputtong, 2010; Meeriam et al., 2010; Song & Parker, 1995). Identities such as gender, age, class, nationality, and ethnicity each influence how participants position researchers, and therefore how they choose to interact within the research process. Specifically, these factors can influence what participants choose to disclose in the interview (Song & Parker, 1995).

As individuals have complex identities, it has been argued that there is no dichotomy of the insider and outside status; rather positions shift depending on the context and the researcher's connection to the participant (Sherif, 2001; Song & Parker, 1995). As an American woman conducting qualitative research in rural Kyrgyzstan, I acknowledge that my own identity often placed me as an outsider, and the manner in which participants placed both myself and my female Kyrgyz research assistant impacted interactions. Further, my frequent outsider status meant that despite efforts to learn the local language and cultural norms, I could often misunderstand linguistic and cultural cues. With the knowledge that my research assistant and I would be placed according to nationality, gender, and age, as well as the potential for misunderstanding, we strove to remain sensitive to the culture and act in ways that created connections with the participants throughout the research process.

Nationality and affiliation

During introductory conversations in the field, I was nearly always asked where I was from and my answer was often met with surprise, as Western visitors are relatively rare in rural southern Kyrgyzstan. My identity as an American is attached with a diverse range of assumptions associated with wealth, privilege, religion, and appearance. This placement by participants often resulted in curious questions as they sought more information about America and compared it with life in their village. I was often told that life was very difficult in Kyrgyz villages, and concurrently asked if, or told that, life was easier in America.

This placing as an American, in addition to my affiliation with the American University of Central Asia, which was also used in introductions with participants, impacted power based dynamics in the data collection process. For instance, affiliations with academic institutions facilitated connections with people of power in the community and gave a level of credibility to

our research (Liamputtong, 2010; Merriam et. al., 2010). It is also possible that my nationality and affiliation placed me as a part of an influential Western establishment and influenced participants' answers, as it has been argued that participants may not report the truth to researchers in power (Gorelick, 1991). Further, the presence of a Western researcher can incite suspicion and that causes hesitancy and unease in the interview process (Liamputtong, 2010). Participants may have misrepresented or manipulated information due to these power dynamics and suspicion; for example, participants may have framed situations to be better than reality if they were trying to impress us as researchers or in order to protect themselves or their community. Conversely, others highlighted problem areas in their village that they thought would be ideal for projects and suggested that I come back with funding for new infrastructure. Both types of exchanges highlight the impact that placing had on what was communicated and how it was communicated during the research process.

While less obvious than my status as a cultural outsider, my research assistant was also placed according to her Kyrgyz nationality, and more specifically, her hometown. While not from the research areas, she was from the neighboring oblast in the south of the country. As the country is divided in topography, culture, and linguistics by north and south, this increased her insider status in our research area. For example, one participant placed my research assistant as from the south before revealing her opinion her negative opinion of the north:

Participant: When those people from [the north] came...are you from the north?

Research Assistant: No, I am from [region neighboring research area].

Participant: Oh good, you are from the south. We are like two countries, the north and the south...when they came, they looked around, but they didn't do anything to help us!

The participant's knowledge that the research assistant was from the south of the country created a connection and made her more willing to share her experiences as she viewed the research assistant as an insider in that aspect of identity. As Liamputtong (2010) states, "insider status will reduce cultural and linguistic barriers" (p. 112). Indeed, this research assistant was intentionally chosen in part for her home's proximity to the research area, which reduced cultural barriers and gave her knowledge of the southern dialect and customs.

Despite this insider placing, in some contexts my research assistant was considered an outsider due to that fact that she was not from the research area and her family was unknown to the participants. While the issues associated with being an outsider are discussed above, our outsider status could also promote different perspectives on norms and assumptions, and give us the freedom to ask for detailed explanations and descriptions (Carter, 2004; Coloma, 2008). For instance, when interviewing WUA officials, it was accepted and expected that we would ask in-depth questions; neither of us were from the area and therefore did not know the system. Further, I asked for explanations about gender norms that may have been taken for granted by insiders. It is also contended that outsiders may be seen as a 'safe' person; participants may be open and honest with an outsider in ways that they would not be with an insider (Hall, 2004; Liamputtong, 2010). It is possible that due to our lack of long term connections to the community, we were safe people to share experiences and opinions that participants would not share with locals for fear of negative repercussions.

Gender

According to Liamputtong (2010), female participants have a tendency to trust female researchers due to shared gender experiences and assumptions. As a female researcher working with a female research assistant in a society that limits cross gender interactions outside the

family, we could comfortably and naturally enter women's spaces that might have been closed to a male researcher. As women, we were invited into homes, kitchens, and courtyards that may have been restricted to men because only women were present. It was often clear that, as reflected in other female researchers' work (Chawla, 2007; Sherif, 2001), shared gender created trust and safety in conversations as participants seemed to share honest emotions expressed in laughter and tears throughout the interviews.

While interactions with female participants fell within cultural norms, one-on-one interactions across genders is especially suspicious and problematic. Therefore, it was beneficial that my research assistant accompanied me during all interviews as it enabled us to interview male officials without the assumptions that can arise with individual interactions between men and women. Further, as it is typically men who drive, traveling as a pair allowed us to accept rides to remote areas and visits to villages and fields from men. This dramatically increased our ability to pursue opportunities and accept invitations without the concern of finding ourselves caught in what might appear as an inappropriate situation.

Age

The Kyrgyz place high honor and status on old age. This is reflected in Kyrgyz linguistics that has different features depending on the relative age of the person the speaker is addressing. Due to the respect for age, our position as young, female, students, did not give us high status among the participants. This may have jeopardized the participants' cooperation and respect of the interview process (Liamputtong, 2010). For instance, while many cultural tendencies were at play, our young age could have affected situations when older participants left interviews prematurely, took phone calls throughout the interview, or when the interview was interrupted or canceled. This often happened when interviewing older participants who held official positions

in the villages when age and authority were each impacting interactions. Conversely, our young age and student status seemed to put other participants at ease, especially for female participants who were initially suspicious of the interview process. Instead of identifying solely as researchers which was both an unfamiliar identifier and one of potential power, our status as students created a known association for the participants and the vulnerability of our young age seemed to produce kindness and hospitality. For example, older women would refer to us as their daughters, offer advice about living in their village, and many ended our interviews with prayers for our studies, families, and futures.

Creating connections through language and cultural sensitivity

In order to be an effective researcher, it is necessary to have knowledge of the culture as well as a continuous cultural sensitivity that enables researchers to constantly learn about the host culture (Liamputtong, 2010). Therefore, I intentionally developed my research timeline to allow space to learn the language and gain knowledge before I began intensive interviews in the villages. Spending the first two months of field research in the capital city provided time for me to experience the culture, take language classes, and interview officials who gave background information on the country, culture, and the geopolitical context that affects water use in the country.

This time proved to be invaluable, as language became a key method to decrease barriers between the participants and myself. By learning Kyrgyz rather than Russian⁴, I was able to communicate respect and honor towards their own language and culture. For example,

⁴ Russian and Kyrgyz are both official languages in Kyrgyzstan. Russian is more common in the northern oblasts and capital, while Kyrgyz is used more frequently in the south. The use of Kyrgyz has been growing since the fall of the Soviet Union, but Russian continues to be used the language of business and many governmental processes, especially in and around the capital.

addressing participants using the respectful kinship terms for aunt/older sister and uncle/older brother communicated honor and appropriately placed myself as a younger person. Although I used a translator for all interviews, having a basic knowledge of the language allowed me to interact with the participants without going through a translator during casual conversation. This connection promoted comfort and openness in the interview process. Spending time in the capital also allowed time to learn cultural practices and norms that were an important piece of respectfully interacting with participants (Liamputtong, 2010). For example, as the majority of interviews happened in participants' homes over many cups of tea or a meal, it was necessary to know honorable greetings, where to sit according to age and status, and other norms of serving tea and sharing meals.

In addition to spending time in the capital, I also embedded myself into the local community by living in the rural research area. This involvement in daily life, accepting and giving hospitality, and immersing oneself in the community has been shown to build trust with research participants (Chawla, 2007; Liamputtong, 2010). Living in the research area as well as conducting two home stays with local Kyrgyz families provided important learning experiences and expressed commitment to the community, culture, and language. Instead of living in a central city and visiting villages for short times, staying in my research area increased my interactions with participants. Living in the community meant they saw me shopping in the local bazaar and using local transportation rather than limiting our interaction to the interview. This increased connection and trust, as well as my insight into participant's daily life. Further, living in the community gave me the time and flexibility to respond to the many unplanned invitations that occurred. It was not uncommon that one interview would become a daylong event: participants would want to show us their land, share a meal, and introduce us to their family and

neighbors. Often, it was during this unstructured time in which I felt I learned the most about the community. While I was an outsider in many ways, observing and participating in daily life gave insights that an interview question could never capture, and living in the community promoted interactions that created trust and connection in the research process.

CHAPTER 2

INTERSECTIONAL INFLUENCES ON PARTICIPATION IN NATURAL RESOURCE MANAGEMENT

This chapter reviews literature relevant to gender in development, the linkage between women and water in the developing world, and participation in natural resource management with a focus on irrigation water. The first section explores trends in the role of gender in the international development literature. The second section discusses the connections between women and water management in the developing world and the third section examines the importance of participatory processes in irrigation management. Based on these reviews, the final section develops a conceptual framework for this research.

Women, Gender, and Development

In development literature today, the significance of women's empowerment and the methods of mainstreaming gender are prevalent themes (Pearson, 2005). However, this has not always been the case, as gender issues were historically seen as a distraction from "real" issues in development (Pearson, 2005). In order to demonstrate the evolution in gender and development literature, the following section will trace the evolutions of the major theoretical frameworks of gender and international development including women in development, gender and development, post modernism, feminist critiques of structural adjustment programs, ecofeminism, and intersectionality.

Women in development

In 1970 Ester Boserup published "Women's Roles in Economic Development," a ground breaking study that brought women's issues into the discussion of development at a time when "literature on economic development and reflections on the particular problems of women [were]

few and far between” (p. 5). In what would inspire the UN Decade for Women between the years of 1975 and 1985, she contended that the mechanization of agriculture limited women’s involvement in this productive activity and therefore reduced their social status (Boserup, 1970). This publication led to the emergence of a larger body of women in development (WID) literature arguing that women’s status is based on their involvement in productive activities (Boserup, 1970; Buvinic, 1983). In practice, these arguments promote increasing women’s access to education and building their skills so that they can compete with men in the labor market (Rai, 2002). While Boserup’s work and the growth of this theory brought women’s issues into the discussion of development, it has been criticized that the focus on production disregards the political barriers and social structures that influence women’s status and livelihoods (Beneria & Sen, 1997).

Gender and development

By the 1980s, the critique of WID prompted a shift to gender and development (GAD), which, in contrast to WID, argues that unequal power relations between men and women are the major barriers to improvement in women’s livelihoods (Enloe, 1989). GAD recognizes the inequality at the household and production levels while also acknowledging the large-scale social constructs that marginalize women (Rai, 2002). Rather than WID’s focus on building women’s production capabilities, GAD promotes an assessment of the structural causes of the marginalization and oppression of women (Enloe, 1989). However, according to Moser (1989), putting these theories into practice in the developing world has been difficult because it is more confrontational than WID and therefore has been less popular in the development field. Further, when major national and international organizations take up the GAD framework, Rai (2002)

shows that they often use GAD terminology without truly addressing women's roles in socio-economic spaces and patriarchal systems.

Postmodern critique of gender in development

During the 1980s and 90s, post-modernism emphasized the issues of difference, identity, and representation. In this context, postmodern theorists advocated for the right of women to communicate their own needs rather than assuming they fit into hegemonic Western assumptions about development (Escobar, 1995; Marchand & Parpart, 1995). In order to promote the valuing of local knowledge, and women's knowledge in particular, Marchard and Parpart (1995) argued against the acceptance of a metanarrative and critiqued the spread of Western hegemony in development. Rather, postmodernism views women's voice in the developing world as expert knowledge. Additionally, Parpart (1993) criticized the tendency of development studies to assume that women in the developing world are a homogeneous group. Instead, postmodernism calls for development strategies to be constructed based on a localized approach that values traditional knowledge (Parpart, 1993).

In contrast to previous ideas of development that assumed that knowledge and skills came from the 'experts' in the west, Edwards (1989) began to argue that development should creatively combine tradition and modernity while valuing local knowledge and culture. This stands in contrast to previous theories of development that assumed the transfer of knowledge and skills from the developed country 'experts' to the developing country (Edwards, 1989).

The impact of SAP on women

Critiques of structural adjustment programs (SAPs), or free market economic policies reforms imposed on many developing countries by the IMF and World Bank, came to light in the

1980s and 90s. During this time, SAPs were offered to countries as financial assistance to reduce fiscal imbalances but required the implementation of neoliberal economic policies as a precondition to receiving the loans (Rai, 2002). This generally resulted in privatization, deregulation, and the reduction of trade barriers. In 2002, the World Bank began integrating poverty reduction into the goals of SAPs but the programs have been widely criticized for the decrease in borrowing countries' sovereignty over economic policies, increases in income disparities, and the privatization of industry and social programs (Beneria et al. 2016).

A large body of literature illustrates the gendered nature of the negative impacts of SAP including Elson (1995) and Sparr's (1994) argument that due to the gendered division of labor, women were disproportionately burdened by the decreasing availability and affordability of social services that SAPs brought about in many of the borrowing countries. Additionally, SAPs' focus on the formal market and production ignored unpaid activities and the reproductive sphere, and thus placed much of the burden of the adjustment on women. Thus, Beneria et al. (2016) demonstrate that rather than being gender neutral, SAPs were insensitive or mistaken in addressing the needs of women.

Women, the environment, and sustainability

Women, environment and development (WED) theories emphasize a distinct connection between the environment and women, rooted largely in their interaction with and dependence on natural resources in their daily tasks (Agarwal, 1997; Leach & Green, 1997). Reflecting ecofeminist ideas, Mechant (1992) argues that just as nature is viewed as inferior to culture, women are viewed as inferior to men. Ecofeminism further connects environmental degradation with gender issues, highlighting the ways in which women rely on the environment and are therefore disproportionately impacted by modernization's damage to ecosystem services (Leach

& Green, 1997). Mies and Shiva (1993) see mechanistic science and colonialism as violence against both women and nature, arguing that capitalism and the mechanization of agriculture for economic growth specifically marginalize women while increasing degradation of the environment. In development initiatives, WED and ecofeminism have promoted an acknowledgement and inclusion of women's knowledge and roles in natural resource management programs (Rodda, 1991). However, it is argued that these theories perpetrate a dichotomy between genders through assumptions of women's roles in relation to the environment (Leach & Green, 1997). Specifically, Jackson (1993) criticized these homogeneous connections between women and nature and argued that the connection between women and the environment cannot be universally applied.

In part due to their use of natural resources and argument that women are more likely to conserve resources than men (Mies & Shiva, 1993), there has been a growing body of literature that links gender and sustainability. For instance, Agarwal (1997) argues that women are motivated to conserve resources due to the increase in their own work when resources are scarce. Further, the 'feminization of agriculture' has promoted an acknowledgement of women's role in agriculture and natural resource use, in part due to globalization and the migration of men from rural areas to urban cores (Radel et al., 2012). Additionally, environmental degradation is assumed to impact women more heavily than men (Arora-Jonsson, 2011) and thus must be looked at through a gendered perspective. However, in addition to gender, conservation practices are influenced by age, social status, and caste, and local ecology (Meinzen-Dick et al., 2014).

Women and empowerment

As theories of development and gender continue to evolve, the concept of empowerment has become an increasingly common in development (Alkire et al., 2013; Narayan, 2002).

Empowerment approaches are often implemented using bottom up strategies in order to meet practical needs that encourage the growth of strategic interests (Moser, 1989; Scott, 2012).

Moser (1989) defines practical gender needs as “those needs which are formulated from the concrete conditions women experience in their engendered position within the sexual division of labor” (p. 1803) and strategic interests as those that increase gender equity in the community.

Moser (1989) and Scott (2012) argue that meeting these practical needs of women can pave the way to meet strategic needs such as poverty reduction, leadership, and power in decision-making. Narayan (2002) defines empowerment as “the expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives” (p. 14), giving community members power to influence decisions that impact their livelihoods. The importance of choice has been largely influenced by Amartya Sen’s work who argues that development is the removal of ‘unfreedoms’ that leave individuals with limited opportunity to exercise agency. Therefore, it is the increase in an individual’s freedom to choose and achieve different outcomes that is essential to development (Sen, 1999).

In order to achieve gender equality and women’s empowerment, gender mainstreaming has become a prevalent mechanism in development initiatives (Parpart, 2013). This idea grew out of the belief that gender equality should be integrated into all levels of programming rather than segregated into its own separate agenda, as shown in the UN Women’s (1997) definition:

Gender mainstreaming the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels. It is a strategy for making women’s as well as men’s concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetrated. The ultimate goal is to achieve gender equality. (n.p)

According to gender mainstreaming, if intervention occurs at every level of development, the gendered power dynamics of a society could be transformed (de Wahl, 2006).

Despite its widespread use across development organizations, Rao (2006) argued that gender mainstreaming has been unsuccessful in the promotion of empowerment and Smyth (2007) demonstrated that these initiatives have often resulted in the decline of resources allocated to programs aimed at women's issues. While the term "empowerment" is commonly used, this widespread use has brought criticism that the term is now too broad and has been transformed into an operationalized outcome rather than a continuous process (Smyth, 2007). Parpart (2013), however, stated that while the transformative results of gender mainstreaming are limited, there is potential for development initiatives to enact change through an increase in research and awareness of gendered hierarchies and structural inequality.

Post-colonial feminism

While women's empowerment and gender mainstreaming focus on the identifier of gender, post-colonial feminism have challenged the universalization of women's experience and the western dominance in feminist thought. Mohanty (1988) has argued widely against the universalization of women in the developing world, arguing also that western feminism has falsely portrayed the image that women in the developing are homogeneously oppressed victims. This has reproduced a form of 'othering' and grants privilege to western values and knowledge (Spivak, 1990). Parpart (1995) and Mohanty (1988) have countered this by illustrating the complexity and diversity of women's experiences across class, ethnicity, and location.

Intersectionality and development

This complexity in gender is echoed in the concept of intersectionality, or the way in which the interconnected nature of multiple identities such as class, dis/ability, ethnicity,

geographic location, gender, and age interact to create specific disadvantages and positionalities. This idea was introduced in the context of the marginalization of women of color in the US (Crenshaw, 1994) and has since informed understandings of development initiatives through an increasing call for the assessment of power in development based on multiple personal characteristics such as age, class, ethnicity, and gender (Tolhurst et al., 2011, Tong, 2011). For example, Walby (2011) argued that the impacts of class and gender should be assessed both separately and at their intersections in order to gain a holistic understanding of power dynamics in a local development context. Further, Grunenfelder and Schurr (2015) argue that the understanding of identities as mutually reinforcing factors is beneficial for both the planning and implementation of development projects.

Brief summary of gender and development policy

The above theories of gender and development: WID, GAD, postmodernism, critiques of structural adjustments programs, ecofeminism, and intersectionality each dictate views of women's roles, conceptualization of power dynamics, and understanding of identity. These interpretations then influence how development initiatives are planned, designed, and implemented. For example, valuing the traditional knowledge of women will influence their inclusion in decision making processes in development, and acknowledging intersectionality promotes the inclusion of a diversity of voices across not only gender, but class, age, ethnicity, and other demographics. This focus on intersectionality and the acknowledgement of the complexity of identity confirms that women in the developing world cannot be assumed to be an undifferentiated group. Instead, development policy and initiatives must acknowledge and act upon the many identifiers that affect power dynamics and decision making within a community. This is vital to development that acknowledges the complexity of power in decision-making.

Further, a focus on empowerment moves the goal of development away from meeting the practical needs and economic growth, and towards an increase in capabilities to make independent decisions.

Water: A Commodity or a Common Resource?

In the developing world during the pre-colonial era, communities usually financed irrigation projects while the daily management was the responsibility of the users. This changed during the colonial period with the increase of industrial farming and the colonial nations' subsequent transformation of irrigation systems to support the large scale agriculture. Then, in the post-colonial period, international development loans began to support irrigation projects in developing countries as governments and donor agencies prioritized agricultural production. These loans also kept agricultural water pricing at a minimum in light of rural poverty (Molle & Berkoff, 2007). However, in order to address water scarcity and the need for financial incentives to promote sustainable water use, there has been increasing attention given to the commodification of water. This idea is marked by the 1992 "Dublin Statement on Water and Sustainable Development" created at the UN sponsored International Conference on Water and the Environment (ICWE). Government designated water experts from over 100 countries, representatives from non-governmental organizations, and members from UN agencies attended this conference. Known as the Dublin Principles, these state that water should be recognized as an economic good due to its economic value and competing uses (Dublin Statement, 1992). It also suggests that water development be based on a participatory approach, outlines the importance of the inclusion of women in water resource development, and acknowledges improved agricultural water use as key to food security (Dublin Statement, 1992). Despite the consensus reached in Dublin and confirmed at the World Summit on Sustainable Development

(Turner et al., 2004), there has been considerable debate regarding the nature of water as a commodity or a common resource.

Pointing to the increase of commodification, Harris (2009) demonstrates that neoliberal agendas have increased the commodification and privatization of water resources. This pricing of irrigation water has been used as a financial tool to maintain the irrigation system, an economic tool to promote conservation, or an environmental tool that counters water pollution (Molle & Berkoff, 2007). Arguing for the commodification of water, Rogers et al. (2002) and Winpenny (1994) agree that water scarcity calls for pricing and management by private companies. It is argued that pricing of environmental goods such as water would create more efficient allocation (Dublin Statement, 1992) and Bakker (2007) claims that giving water an economic value would curb wasteful practices as prices rise to reflect value and shortages. Further, Bakker (2007) points to widespread state failures in the management of water distribution as corruption and limited state resources have obstructed governments' provision of water to their citizens.

Those critical of the commodification of water draw upon the argument that water is a human right, as the UN Committee on Economic Social and Cultural Rights states that every person has a right to "sufficient, safe, acceptable, physically accessible and affordable water" (ECOSOC, 2002). Specifically, Gleick (1998) argues that commodification hinders this right to water through exclusions created by the establishment of prices that are not universally affordable. Advocates of water as a human right also draw upon the historical use of irrigation water as a common resource and criticize the current "neoliberalization of nature" in the creation of private rights over what had previously been a pooled resource in many communities (Bakker, 2007; Heynen & Robbins, 2005). Additionally, Trawick (2003) argues that access to agricultural

water is prerequisite to the right to food. In response to the critique that common resources encourage wasteful use, Shiva (2002) argues that community solidarity and accountability, not the market, is the most effective method to decrease wasteful behavior. Further, she argues that much of the value of water is impossible to capture in a market price. Bakker (2007) and Shiva (2003) demonstrate that the costs of public health and environmental externalities that are impacted by water management are difficult to reflect in prices. It is also argued that the aesthetic, symbolic and spiritual values that water can hold are impossible to capture in price (Bakker, 2007; Shiva, 2002).

It has been demonstrated that the policies that commodify irrigation water have specific impacts on smallholder farmers and particular attention has been given to the effects that commodification has on female farmers. Ahlers and Zwarteveen (2009) argue that neoliberal water agendas prioritize uses with high economic returns, which often translates to valuing large industrial farms rather than smallholder farms, resulting in a decrease in smallholders' water security. Ahlers' (2005) critiques the neoliberalization of water due to its focus on more efficiency and less on the equitable distribution of water therefore exacerbating women's unequal access to water (Ahlers, 2005). Further, Van Wijk et al. (1996) demonstrate that because of the high proportion of women in poverty, they suffer disproportion effects of water pricing in comparison to men. Echoing these critiques of the neoliberalization of water, Harris (2009) calls for the need for alternative political, economic, and governance agendas that recognize both the socio-cultural and economic dimensions of irrigation water in order to promote its equitable and efficient distribution.

It has been shown they women rely more heavily on common resources than their male counterparts (Agarwal, 1997); therefore, water effectively managed as a common resource can

be key to their livelihood. As shown above, however, critiques of the management of water as a common resource argue that pricing promotes efficient and sustainable distribution for all water users, including women.

Participation in Water Resource Management

Trends of participation in development

In the midst of the conflict regarding how water should be managed, there has been an increase in the use of participatory natural resource management that promote community based decision making regarding natural resources such as water. While the term participation is used quite broadly in development, there is no consensus of its definition. As Tufte and Mefalopus (2009) state, “Some stakeholders define participation as the mobilization of people to eliminate unjust hierarchies of knowledge, power, and economic distribution. Others define it as the inclusion of inputs by relevant groups in the design and implementation of a development project” (p. 4). Definitions from major development organizations reflect these differences. For example, the Asian Development Bank defines participatory development as “a process through which stakeholders can influence and share control over development initiatives, and over the decisions and resources that affect themselves,” and acknowledges that participation ranges from “superficial to deep” in development initiatives (Ondrik, n.d.). According to the World Bank, participation improves service provision, promotes advocacy goals, assists in monitoring progress and facilitates learning among local groups (Tufte & Mefalopus, 2009). While Ondrik (n.d) states that participatory approaches are not necessarily convenient to implement, he contends that these inclusive processes increase identification of local perspectives and produce a high level of ownership of the initiative in the community.

Many of the typologies of participation are based on Arnstein's (1969) "ladder of participation" in which she categorizes the eight levels of participation: manipulation, therapy, informing, consultation, placation, partnership, delegated power, and citizen control. Similarly, in Cornwall's (2003) critique of participatory initiatives, she adapts Pretty's (1995) and White's (1996) typologies to illustrate four modes of participation: functional, instrumental, consultative, and transformative. Participation is also connected to the empowerment of individuals: Narayan (2002) cites inclusion and participation in decision-making as a key element in empowerment and Cornwall (2003) contends that transformative participation has the potential to empower citizens with confidence to engage in decision-making processes.

It is not enough to simply assume individuals will participate in community processes. Rather, they need access to understandable and relevant information that gives them the choice to participate and equips them with needed knowledge to participate effectively. As Mchombu (2004) demonstrates, awareness of development information leads to interest in and examination of an idea, which then allows the individual to accept or reject the information. This knowledge, he argues, empowers community members to solve problems based on the available information (Mchombu, 2004). Further, Narayan (2002) and Alsop et al. (2006) demonstrate that access to information and the ability to make purposeful choices is vital to participation. Specifically, increased information regarding opportunities and rights provided in a timely and understandable manner makes it possible for citizens to make effective decisions (Narayan, 2002) which can then be converted into positive outcomes (Alsop et al., 2006).

It is also shown that access to information is impacted by individuals' intersections of identity and access to social networks. For example, Grabe (2011) demonstrates that women's class is associated with access to information and Mchombu, (2004) demonstrates that young

women may have less access to information than older women due to limited opportunities to leave the household, which inhibits their interaction with those who hold knowledge.

Conversely, when individuals do have access to information, they are equipped to exercise their rights, access services, hold leadership accountable, and take advantage of opportunities such as participation in local governance (Narayan, 2002).

Water management and participation

Participation in water management, as part of the transfer of water governance from centralized to local management, has become increasingly common in the neoliberal agenda that includes the devolution and democratization of water governance (Harris, 2009). This increase of local participation has also been coupled with the growth of sustainable development. For example, according to Farolfi et al. (2006), water governance in sustainable development includes participation, greater equity, financial viability, and addressing environmental concerns. These principles have been implemented in integrated water resource management (IWRM), and decentralized management in basin committees or WUAs (Farolfi et al., 2006). It is argued that participation decreases costs for governments as farmers take on responsibilities, improves farmers' incentive to manage water productively, and increases efficiency through local management's quick response to problems or changes (Groenfeldt & Svendsen, 2000). Ahlers and Zwarteveen (2009) also argue that participation is a part of the right to water. Specifically, they contend that participation in management decisions as well as the accompanying obligations such as contributions in finances or labor should be included in a holistic definition of water rights.

Literature reveals mixed results in the decentralization of water management and corresponding increase in local participation. In Mexico, farmers indicate water access has

improved after the transfer to local management, but data shows that water use efficiency has decreased (Palacios, 2000) and in China, the establishment of WUAs was shown to decrease water conflicts among farmers (Wang et al., 2010). In Columbia, local management has resulted in more flexible irrigation plans, but local institutions lack funding for maintenance of infrastructure and equipment replacement (Quintero-Pinto, 2000). While it has been shown that farmer participation can improve water delivery services, reduce government costs, and improve equity, Meinzen-Dick (1996) acknowledges these mixed results by arguing that participation is not a “magic bullet.” Rather, the impact of participation depends on enabling conditions created by an effective partnership between the state and the water users (Meinzen-Dick, 1996).

Women and Participation in Water Management

In development, women’s role as domestic water managers has long been established (Elmendorf & Isely, 1983; van Wijk-Sijbesman, 1985) but discussion of gender in irrigation was delayed by the assumption that men work in income generating agriculture while women work in the home (van Koppen & Hussain, 2007). This assumption of the gendered division of labor supported the idea that men managed irrigation water while women managed domestic water (van Koppen & Hussain, 2007). By the 1990s, however, women’s role in agriculture and irrigation was increasingly acknowledged and therefore addressed through targeting both male and female farmers in decision-making and leadership in irrigation processes (van Koppen & Hussain, 2007).

In some contexts, irrigation may indeed often be men’s responsibility due to gendered divisions of labor. van Koppen (2001) acknowledges this potential but argued for a gendered analysis of water policies due to the constant presence of female farm managers who require irrigation water in male dominated farming systems. Further, Hussain (2007) contends that

female-headed households are often the most disadvantaged in a community, which compounds the need for policies and interventions that promote women's access to irrigation water.

Quisumbing's (1996) also argues that access to irrigation water will promote an increase in production as equitable access to productive resources increases female farmers' on-farm yields. Therefore, women's access to irrigation is critical to improving rural livelihoods and should be addressed through policy formation, project design, and implementation (Hussain, 2007).

Despite the growth in participatory initiatives in the irrigation sector and the creation of policies that explicitly promote the inclusion of women, their participation in decentralized, community based management such as WUAs is frequently lower than their male counterparts (Meinzen-Dick & Zwarteveen, 1998). Barriers to participation in WUAs include formal membership requirements such as land rights or head-of household status (Meinzen-Dick & Zwarteveen, 1998). These membership rules systematically exclude women from participation, as it is common for men to hold both formal rights to land ownership and the status of head of the household (Meinzen-Dick & Zwarteveen, 1998; van Koppen, 2001).

In addition to formal requirements, it has been shown that social norms prevent women from participating in community organizations. For example, women's lack of social mobility and time poverty due to household responsibilities hinders their ability to attend community meetings where knowledge transfer and decision making occur (Das, 2014; Meinzen-Dick & Zwarteveen, 1998; van Koppen, 2001). Traditional social norms that dictate male dominance in public spheres also influence women's ability to participate in WUAs, as it is often unacceptable for women to lead or vocally participate in community meetings (Zwarteveen and Neupane, 1996; van Koppen, 2001). Further, if women do participate, it has been shown that their opinions and values may not be given weight in the decision making process (Agarwal, 1997). Low

participation of women in WUAs has also been related to the preservation of patriarchal power dynamics; it is argued that women's lack of participation in irrigation management promotes a dependence on men that maintains their dominance at the community and household levels (Bourque & Warren, 1981).

Low participation in WUAs can hinder women's access to information and deny their right to participation in community decision making. However, despite women's lack of formal participation in irrigation management, Zwartveen and Neupane (1996) demonstrate that this noninvolvement does not necessarily decrease female farmers' water access; therefore women may choose not to participate in the formal decision making processes. Citing a case in an irrigation area in Nepal, the authors show that women can effectively use informal means to access water and resolve conflicts. Participation was seen as an unnecessary and time-consuming activity for the women. Consequently, it was difficult for the irrigation organization to enforce regulations with these female farmers who do not participate and noncompliance decreased efficiency while increasing conflicts among water users (Zwartveen & Neupane, 1996). Therefore, it has been argued that women's inclusion in natural resource management initiatives improves sustainable use of that resource as participation could increase women's adherence to regulations (Agarwal, 1997; Upadhyay, 2003).

Increased participation and policies that promote women's involvement can also improve women's water security by giving them a formal and more reliable access to water (Meinzen-Dick & Zwartveen, 1998) which can serve to improve livelihoods through increasing agricultural yields (van Koppen, 2001). Finally, in addition to improved efficiency and water security, it is demonstrated that participation in natural resource management has the potential to empower women in their community, as empowerment in one sector is often associated with

empowerment in other domains (Alkire et al. 2013). For example, Upadhyay (2003) argues that women's participation in resource governance promotes gender equity and improves their status in the community and household as decision makers.

While many cases illustrate women's disproportionate participation water management in comparison to their male counterparts, Sultana (2009) illustrates the intersectional nature of water access by showing that class, ethnicity, and educational level impact women's access to water. Hierarchies based on age, class, race, geographical context, and religion have also been shown to impact participation (Cleaver, 1998; Das, 2014; Guijt & Shah, 1998). Therefore, Agarwal (2001) and Harris (2009) call for the need to assess participatory initiatives for intersectional exclusions that influence who is given a role in decision-making in natural resource management.

Conceptual Framework

As shown in the above review, participatory processes in natural resource management are a growing trend in development practice. However, gender inequalities and intersectionality influences who is included in participation, prompting the need to assess participatory processes for exclusions based not only on gender, but also on age, class, geographical location, and ethnicity. This review also illustrated how access to information, choice, and inclusion influence an individual's participation, or non-participation, in natural resource management. Finally, this review showed that participatory processes in natural resource management have the potential to promote equity, efficiency, and empowerment. The relationship between these ideas is illustrated below in the conceptual framework.

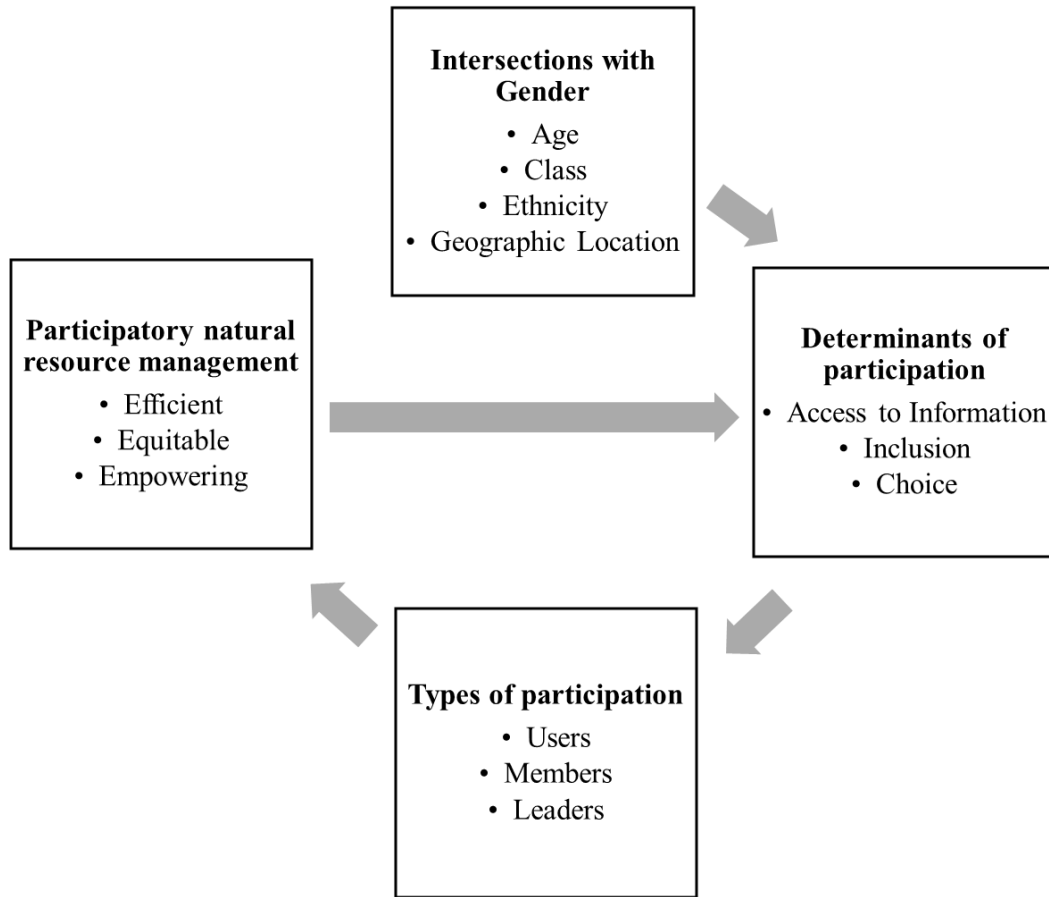


Figure 3: System of Participatory Processes in Natural Resource Management

The conceptual framework above illustrates that gender, age, class, ethnicity and geographical location interact to influence the determinants of participation, highlighting that it is not gender alone, but the complex intersections of these attributes that influence participation. Specifically, the intersections of these attributes influence an individual's access to information, choice to participate, and inclusion in natural resource management. Other intersections may be added depending on the context of the community. For example, a young, lower class male may have more or less access to information than an older, middle class female depending on the cultural context. Some water users may not have access to information needed to participate. Others may have the information but are excluded from decision-making. Still others may

choose not to participate. This then determines how they participate in community initiatives as users, members, or leaders.

Users consume the natural resource without participating in the community management whether due to exclusion, limited access to information, or choice. Members use the resource and participate in the management process while leaders direct the management process. These users, members and leaders make up the natural resource management process that should be equitable, efficient and empowering. For example, participatory processes should support efficiency through the increased ownership and adherence to regulations as members have opportunity to approve and revise regulations. It should also support equity by giving all users a choice to participate in resource management and a voice in decision making. Participatory process should create structures for monitoring resource use as well as space for conflict resolution that allows all users to communicate and resolve grievances in the event of unequitable use. Finally, participatory processes should promote empowerment through equipping users to solve problems and make decisions in resource management.

This process is cyclical in nature; that is if the process promotes equity, efficiency, empowerment, there will be an increase in access to information, inclusion and choice to participate. On the contrary, if the process is limited in its efficiency, empowerment, and equity, exclusions will be common, users may choose not to participate, and access to information may be low.

Examining participation with this framework acknowledges the complexity of intersectional attributes within a community. Rather than focusing solely on gender as an indicator of participation, this research recognizes that multiple intersections influence access to information and inclusion and further, that some users may choose not to participate. It also

highlights the cyclical nature of the participatory system; that is, the absence of an efficient, equitable, and empowering process limits information, inclusion, and choice while the existence of an efficient, equitable, and empowering process promotes participation.

It has been shown in the above review that equity and efficiency of participatory natural resource management systems such as WUAs are improved by the inclusion of women and that participation has the potential to empower women while meeting the practical need of water security. In addition to gender, however, it has been shown that the intersections of personal and spatial attributes influence access to information, choice, and inclusion in participatory processes. Therefore, assessing WUAs to explore how intersectionality shapes who participates as users, members, or leaders in WUAs adds to the understanding of inclusive processes, access to information and choice of participation. This assessment of WUAs in Southern Kyrgyzstan can then provide an example of the factors that affect efficient, equitable, and empowering processes in natural resource management.

CHAPTER 3

HISTORICAL, REGIONAL, AND LOCAL PERSPECTIVES ON IRRIGATION AND PARTICIPATION IN KYRGYZSTAN

In order to understand the context of women's participation in WUAs in Kyrgyzstan today, it is important to establish the historical and regional water issues that influence how irrigation and participation are currently viewed and performed. This chapter is divided into three parts. First it will provide an overview of pre-Soviet irrigation in Kyrgyzstan, discuss the effects of the centralized policies of the Soviet Union, and highlight the regional issues that have arose since the collapse of the Soviet Union and consequent rise in transboundary water issues. Second, it will illustrate current WUA policies, water user rights, and trends in WUAs in order to understand the current concept of WUAs in Kyrgyzstan.

Third, after establishing the historical and regional influences on WUA in Kyrgyzstan, this chapter will introduce the roles and functions of WUAs in the research areas in Batken, Kyrgyzstan. Based on interviews with village leaders, WUA officials, and farmers this chapter will discuss how WUAs in the research areas operate, and will examine the challenges the WUAs are facing while placing them in the broader context of water management in the region.

Pre-Soviet Irrigation Management

Long before the centralized water use strategies of the Soviet Union, and before the government implemented WUAs, the Kyrgyz people organized water use under the management of village leaders (O'Hara, 2000; Igoe, 2007). In the northern region of the country, the Kyrgyz were largely nomadic people, moving with the seasons to find pastures for livestock, but villages in the south relied on the Naryn and the Syr-Darya rivers as well as their tributaries for irrigation (Fitzherbert, 2006). These rivers rise in the central Tien Shan and Ferghana mountain ranges and

supported irrigated agriculture in the Ferghana Valley with evidence of managed irrigation in the area dating back to the 9th-13th century (Fitzherbert, 2006). During this time, villages formed themselves into *ketmans*, or groups of 3-4 villages who pooled resources to construct and maintain irrigation systems. These were overseen by *myrabs*⁵, or leaders who were paid by the farmers to ensure fair water distribution and oversee construction and maintenance. *Myrabs* also had the authority to police water access as users who did not contribute to the maintenance of the irrigation system could be denied access to water and land (Igoe, 2007). *Aksakals*⁶ also participated in the water management, with roles that included overseeing *myrabs* and solving disputes in the community (Igoe, 2007).

In this context, water was viewed as a common resource as the *ketmans* served as the organization for civil society to manage water resources. The users maintained irrigation infrastructure and each member of the community received rights to the resource contingent on their participation in community labor obligations. At that time in history, it appears that women were often equally included in both the agricultural sector and irrigation management as the high need for labor in the nomadic and agricultural lifestyle encouraged the inclusion of women (Blackburn, 2011). Further, women were rarely segregated from men in social settings (Giovanelli & Akmatova, 2002) suggesting that they could have worked with *myrabs* and attended *ketman* meetings. However, the patriarchal *aksakal* tradition suggests that women may not have held official leadership positions in irrigation management. This traditional structure of *ketmans* and management by *myrabs* persisted where irrigation management was used until the

⁵ This term continues to be in use today to refer to the WUA staff member responsible for distributing irrigation water and collecting payments.

⁶ Literally, “white beard.” This term is used to describe male elders in the community who were given authority in decision making and conflict resolution. This term is still in use today to describe male elders.

Soviet invasion and subsequent restructuring of the land that resulted in a drastic transformation of irrigation management and infrastructure.

Soviet Era Transformation of Irrigation

As a part of the large scale Russian expansion, Russian troops defeated northern Kyrgyz forces in 1876 and within five years all of present day Kyrgyzstan became part of the Russian Empire (Curtis, 1997). As the Soviet Union grew both in authority and need for resources, Kyrgyzstan's powerful rivers and fertile lands were seen as important assets for the development of the Empire's economy, specifically for cotton and hydroelectricity production (Igoe, 2007). This required the redirection of Kyrgyzstan's rivers as well as an increase in cultivated area: under Soviet administration the irrigated area in Central Asia increased from 4.5 million ha in 1965 to over 7 million ha in 1991 (see Table 3) (Wegerich, 2008). While much of this cultivated area was in downstream countries, the centralized authority transformed Kyrgyzstan's free flowing rivers and community based infrastructure into a system designed to provide water for the large scale production in *kolkhoz* (collective) and *sovkhos* (state) farms. No longer would the *ketmans* and *myrabs* of the past suffice for the management of water resources; instead, the Soviet Ministry of Water became the primary management for water use, rendering community decision making obsolete (O'Hara, 2006).

Indicator	Unit	1960	1970	1980	1990	2000
Irrigated Area	1000 ha	4510	5150	6929	7600	7990
Total water diversion	km ³ /year	60.61	94.56	120	116	105

Source: Altiyev, 2006

Disputes between the upstream and downstream Central Asia republics did occur during the Soviet era, but the republics also benefited from the regional approach that allowed for the

sharing of water, energy and food resources. Energy was provided from the oil and gas rich downstream republics and water was released from the upstream dams and reservoirs during the summer for agricultural production in the fertile Ferghana valley (Wegerich, 2008). While Kyrgyzstan contained a relatively small portion of land suitable for the production of the Soviet Union's intensive cotton production, it was a vital source of water for the downstream republics (Igoe, 2007). This was made possible largely by numerous hydroelectric and irrigation construction projects implemented by the USSR. One of the most notable is the Toktogul Dam, located in Kyrgyzstan on the Naryn River with a capacity of 1,200 megawatts, supplying irrigation water for up to 0.5 million ha of land (Wegerich, 2008). The Soviets also transformed irrigation technology on a smaller scale, building irrigation canals and reservoirs that served *kolkhoz* and *sovkhos* farms according to soil type, climate, and cropping system (Igoe, 2007). This incredible transformation of water management has created long-term environmental damage, as well as a high reliance on the Soviet Union for finances, technical expertise, and regulation of the centralized system. Upon the collapse of the Soviet Union, these environmental issues and reliance then created a difficult transition into independence for the region.

Post-Soviet Transformation and Implications in Irrigation

The collapse of the USSR in 1991 and the subsequent creation of five independent Central Asian republics (Turkmenistan, Kazakhstan, Uzbekistan, Tajikistan, and Kyrgyzstan) transformed major river basins into transboundary water sources requiring international cooperation and negotiation. Initially, these countries agreed to extend the Soviet Union's water policies and quota system. Consequently, in 1992, the republics signed the "Cooperation in the Joint Use and Protection of Water Resources of Interstate Significance" policy and formed the

Interstate Commission for Water Coordination (ICWC) to enforce regulations and water allocation (Mosello, 2008).

These republics were also faced with the need to address environmental degradation due to mismanaged irrigation by the Soviet Union. Particularly, the Aral Sea crisis, which has been labeled the “starkest symbol of the Soviet Union’s poor water resource management” (Mosello, 2008, p.157) required, and continues to require, cooperation by the republics. Located downstream from Kyrgyzstan on the border of Uzbekistan and Kazakhstan, the Aral Sea was once the fourth largest inland sea in the world, but its volume has since decreased by 90% (Micklin, 2007). Largely due to the extensive and mismanaged irrigation of monoculture cotton in the area, the shrinking has caused massive environmental, social, and economic repercussions. Specifically, wind blows the salt and sand from the dried bottom of the Aral Sea onto land as far as 500km away and can significantly decrease production capacity when it settles on vegetation (Micklin, 2007). Further, the maritime climate surrounding the Aral Sea has become more similar to a desert climate with warmer summers, cooler winters, and a shortened growing season. Biological diversity has greatly diminished, and tens of thousands of fisherman have lost their source of income due to the decrease and eventual disappearance of the fish populations (Micklin, 2007). Finally, among the population in the Aral Sea basin, health issues have increased, including respiratory problems from blowing dust and salt and intestinal disorders from the low quality of drinking water (Micklin, 2007). In order to address this regional disaster, the republics established the Interstate Council for the Aral Sea Basin and the International Fund to Save the Aral Sea in 1993. These agreements signified a unified effort among the Central Asian Republics to address the regional crisis while assisting the populations living in the Aral Sea basin (Mosello, 2008).

Despite the creation of interstate agencies, it has been difficult for the republics to establish water quotas that were both acceptable to each state and environmental sound. Limited institutional capacity, low funding, and a lack of enforcement of agreements (Mosello, 2008) have hindered the success of transnational water agreements and management. In the Syr Darya basin and the fertile Ferghana Valley that spans Uzbekistan, Tajikistan and Kyrgyzstan, tensions revolve around the conflicting needs of water for energy and water for agricultural production. Specifically, Kyrgyzstan prioritizes releasing water from the Toktogul reservoir in the winter in order to meet their population's needs for heat and electricity. Uzbekistan and Kazakhstan, however, require this water during the summer months for cotton and other crops. These conflicting needs have thus far made it difficult to come to lasting agreements about water use.

On an international level, disagreements continue as the republics seek energy and water independence from their neighbors, but tensions are also seen on a local level as cross-border skirmishes surrounding water are known to occur. For instance, in March of 2016, Uzbek and Kyrgyz troops were deployed to the border in what was reported to be a conflict regarding access to a reservoir used by both nations (Eurasianet, 2016). Ethnic tensions, highlighted in the violent clashes between Uzbeks and Kyrgyz in the south of Kyrgyzstan in 2010⁷, exacerbate the conflicts over water. Further, shared reservoirs and rivers flowing through Tajik and Uzbek enclaves within Kyrgyzstan complicate water rights on both an international and local level. Consequently, as territories are interwoven and borders can be permeable, water rights and allocation can be unclear for the now independent republics.

⁷In summer of 2010, three days of violent clashes in Osh, left numerous dead, injured and fleeing the violence. Reports of casualties vary greatly: the initial report from the Kyrgyz government estimated 178 but eyewitness accounts claimed 700. 2,000 casualties were later reported by Kyrgyzstan's interim president (Bond & Koch, 2010).

There is the potential for tensions on a local and international level to be intensified as environmental change is forecasted to increase the gap between water supply and demands for the resource in the region. Specifically, Kyrgyzstan's glaciers and snowfields decrease are expected to decrease and thus reduce the water supply to the region. While it is projected that Kyrgyzstan will be able to meet its own water needs for the foreseeable future, downstream countries rely on water from the mountains of Kyrgyzstan will be effected (Climate Risk and County Adaptation Profile, 2011). This stress on the water system necessitates the need for efficient water use in order to conserve and sustainably manage resources within Kyrgyzstan and the region.

Irrigation and Participation in an Independent State

In the midst of economic and political instability following the collapse of the Soviet Union in 1991, Kyrgyzstan emerged as an independent, democratic nation facing an economic crisis as centralized policies, trade, and production disappeared. Social services once subsidized by the Soviet Union were no longer available, and poverty rates increased rapidly. Out-migration for labor become, and continues to be, a key livelihood strategy. Finally, agriculture production, and thus irrigation water, became increasingly important to individuals' livelihoods as the land reform distributed land to each Kyrgyz citizen.

Land redistribution

Among the many changes occurring in the new state, agriculture was drastically transformed by the transition from *kolkhoz* and *sovkhos* farms to private smallholder farms. In 1988, 98% of the arable land in Kyrgyzstan was controlled by just 500 *kolkhoz* and *sovkhos* farms. In 2008, just 25% of the land was controlled by agricultural enterprises (the successors of

kolkhoz and *sovkhoz* farms) and 300,000 smallholder farms made up the remaining 75% of farmland (Lerman & Sedik, 2009). Despite this incredible change, the irrigation infrastructure remained largely unchanged; the same canals used to serve the centrally managed farms were now being utilized to distribute water to the smallholder plots of land.

This functional change without the corresponding structural transformation has contributed to the low irrigation efficiency and resulting environmental issues. Specifically, it is estimated that Kyrgyzstan's irrigation distribution efficiency is only 55% due to the poor condition of the canals (FAO, 2016). Inadequate drainage systems have increased soil salinization throughout the country; as of 2003, 14,900 ha were considered highly saline (Alymbava, 2004) and on average, 27% of harvest loss in the country is lost on saline land (FAO, 2016). Waterlogging has also been reported to be causing a decrease in crop yields; in 2004, approximately 114,100 ha were estimated to be waterlogged (Alymbaeva, 2004).

In order to manage this transition to private family farms, Kyrgyzstan implemented the *Land Codes of the Kyrgyz Republic* in 1994 and 1999 as well as the *Agricultural Land Regulation* in 2001 to establish land privatization regulations and direct the redistribution process. While these mandated that each family receive a standard amount of land called *ylysh*, equity in land redistribution and water access has been questioned. Specifically, it has been shown that community members who held positions of power in Soviet farms received large plots of land upstream on irrigation canals, therefore ensuring better water access than those downstream (Herrfahrdt et al, 2006). As water access has obvious implications on agricultural production, this inequitable redistribution impacted, and continues to impact, the farmers who rely on production for their livelihoods. Instead of supporting all farmers' livelihoods in the

newly independent state, redistribution has supported existing power structures and left many farmers with little or unproductive land.

Establishment of WUAs

In order to address the deteriorating infrastructure and the need to distribute water to the newly formed farms, the Kyrgyz government initially gave the responsibility of water management to village councils. Already tasked with managing schools, medical clinics, roads and drinking water, these village councils lacked financial and human resources to maintain irrigation systems and the infrastructure continued to deteriorate (Alymbaeva, 2004).

In order to address some of these inefficiencies, in 1995 the Water Code established a legal framework for WUAs that set forth functions, financial guidelines, and organizational structures of the WUAs. However, the Water Code limited the participation of farmers in decision making by concentrating control with the WUA officials and prohibiting farmer access to WUA financial records and work plans (Alymbaeva, 2004). After the Kyrgyz government established the first WUAs in 1995, the Asian Development Bank (ADB) supported a pilot of three WUAs. The World Bank then began working alongside the ADB to support countrywide development of WUAs (Sehring, 2005). In 1997, the second WUA resolution, in an attempt to decrease the continuing water conflicts, called for the establishment of WUAs within hydraulic rather than administrative boundaries. It also established that a farmer's right to water could be revoked if they did not pay the newly established irrigation service fees (Alymbaeva, 2004).

WUAs were placed under the federal Ministry of Water Management and Processing Industries (see Figure 4). At the beginning of each growing season, farmers make a contract with

the WUAs for the water they will need. Based on these contracts, the WUAs make a contract with the *RayVodKhoz* for water their WUA service area will require that season.

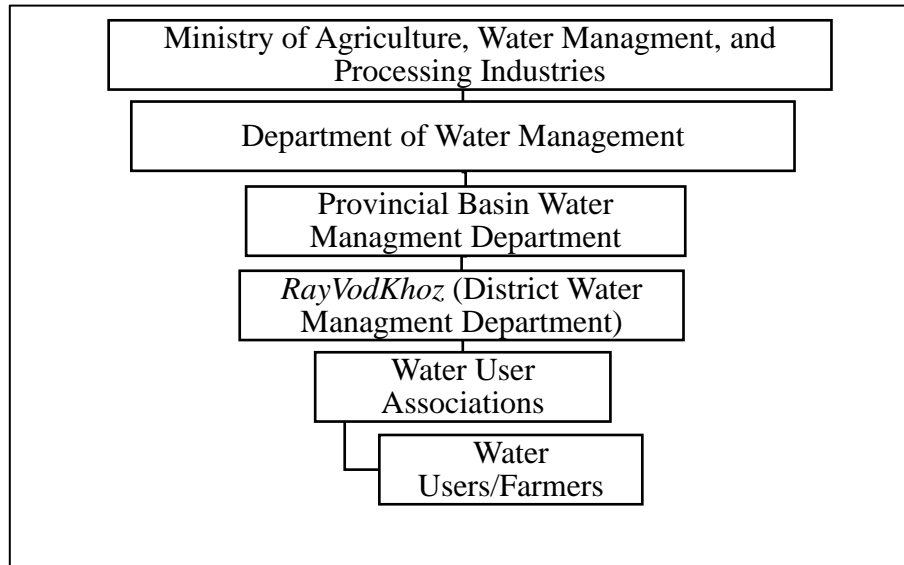


Figure 4: Structure of Water Management in Kyrgyzstan
Source: Sehring, 2005

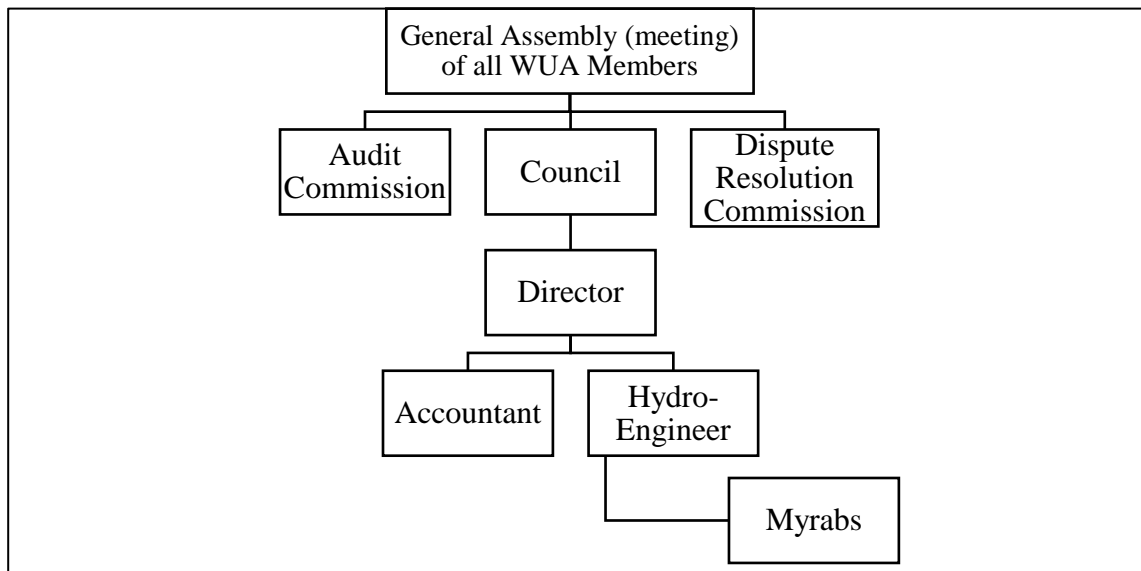


Figure 5: Structure of WUAs
Source: Sehring, 2005

The current Water Law, passed in 2002, clarifies WUAs' role as non-commercial organizations that acts in the public interest in the operation and maintenance of rural irrigation systems. Specifically, the Water Law (2002) outlines WUA's principles as:

1. Ensuring full participation of all members of the WUA in establishment and operation
2. Fair and democratic decision making processes
3. Guaranteeing free access to information for WUA members about its activity
4. Ensuring a fair and equitable distribution of irrigation water for all WUA members
5. Ensuring rational and careful use of water so as to minimize waste, and prevent erosion, salinization and over-watering of irrigated lands

These principles guide the organization and roles of the actors involved in the WUA (see Figure 5). The council (usually 7-11 members) is elected by members and is led by a chairman/woman. The director, accountant, hydro-engineers and *myrabs* are paid staff but depending on the area and available finances, the director may cover multiple roles. *Myrabs* are hired on a seasonal basis and in some areas, other roles may also be seasonal (Sehring, 2005). The 2002 law also introduced two new structures to the WUA: the audit commission and dispute resolution commission. The audit commission inspects the financial records of the WUA and the dispute resolution commission mediates conflicts over water distribution between water users. However, according to the field research, these commissions do not exist in all WUAs and may depend on the leaders' or members' initiative to establish and continue these structures.

WUA member rights and responsibilities

In contrast to the previous laws that supported the continuation of centralized decision making, changes in the 2002 Water Law promote an increase in farmer participation through an open election process and access to WUA information and records. Specifically, according to the Water Law (2002), each member has the right to:

1. A fair and equitable share of the irrigation water which is distributed by the WUA;
2. Participation in the decision making processes of the WUA;
3. Vote at general meetings providing that s/he has paid all requisite charges concerning with activity of a WUA;
4. Propose agenda items for discussion at meetings of the General Assembly;
5. Nominate candidates for and stand for election to the WUA management structures;
6. Benefit from services provided by the WUA;
7. Compensation where they suffer damage to their crops or to their land plots as a result of operation and maintenance activities undertaken by the WUA;
8. Check accounting books and documentation

Further, in contrast to previous policies, this law clarifies farmers' voting rights by guaranteeing that every member has at least one vote. While WUAs can choose to distribute votes based on land size (giving those with more land more votes in an election), it does mandate that no one member can hold more than a quarter of the total votes (Water Law, 2002).

Voting and other decision making occurs at the general assembly of all members (or a group of representatives elected by all members) that must meet a minimum of once per year and must have a quorum of 60% of the WUA members or representatives. According to the 2002 Water Law the general assembly's roles are:

1. Defining main directions of activity of the WUA;
2. Amending the Charter;
3. Approving the provisions of the Council of the WUA and of the Auditing commission;
4. The election and removal of the Council members;
5. Election of the Audit Commission;
6. Election of the Dispute Resolution Commission;
7. Setting the annual fees payable by members and non-members;
8. Approving the annual report and accounts;
9. Approving the annual budget of the WUA;
10. Approving the work plan and watering plan and schedule.

In order to act on these rights and participate in the general assembly, all members must pay an irrigation service fee (ISF) to the WUA. Non-members who use water from WUA operated and maintained canals must pay the ISF at 1.5 times the member rate. On average, WUAs collect 5.77 tyin/m³ of water⁸ (ADB, 2011) but some WUAs charge based on the amount of time a farmer's water gates are open. These ISFs are meant to cover *RayVodKhoz* water fees, staff salaries, taxes, administrative fees, and infrastructure construction and rehabilitation. Collecting these ISFs has been a documented problem in WUAs throughout the country and many WUAs have debts to the *RayVodKhoz*. However, collection rates are improving with the development of WUAs. According to the ADB (2013), in 2001, WUAs paid 71% of the ISF owed to *RayVodKhoz* and by 2011 this percentage had increased to 88% of ISF paid to the *RayVodKhoz*.

⁸ 1 Tyin = 0.01 KGS. At the time of writing, 1 KGS = 0.014USD. 5.77 Tyin is less than 0.01 USD.

Despite the countrywide increase in the collection rates, WUA financial viability continues to be questioned (Alymbaeva, 2004; Wegerich, 2008).

In addition to, or in place of a monetary payment of ISF in some WUAs, farmers can contribute to the WUA through participating in *ashar*⁹ to maintain the water infrastructure. Use of this informal structure varies by WUA, but in the research areas, *ashar* were generally held once or twice a year to clean the canals. Households were expected to send at least one representative to contribute. Depending on the WUA, this labor can be used as an in-kind payment of ISFs, a voluntary contribution to the community, or a requirement in addition to monetary ISF. The use of *ashar* allows the WUA to maintain the smaller canals and promotes community ownership of the infrastructure; however, it is not sufficient for major rehabilitation and repairs that many of the larger canals require (McGee, 2011).

Access to information about WUAs

While the first WUAs were established in 1995, knowledge of WUAs has been reportedly low throughout the country (Wegerich, 2000; WUA Support Unit, 2014). In a study of a WUA in a northern region of Kyrgyzstan, it was found that 47% respondents knew about WUA services, only 6% knew the services very well, and 25% did not know about the services. Similarly, 46% reported knowledge about WUA rules and regulations and 36% reported that they did not know about WUA rules and regulations (Ajibekov, 2015). Further, Wegerich's (2000) case study of WUAs in four Kyrgyz villages reveals a large disparity in farmer knowledge across locations. In two of the research areas, farmers were largely unaware of the WUA and did not know they should form a contract with the WUA for water they would need

⁹ *Ashar* is a traditional practice of gathering community members for volunteer labor to build or maintain community structures such as mosques, schools, or water canals.

each growing season (Wegerich, 2000). In contrast, two of the research areas revealed higher access to information about WUAs. There, farmers knew their rights as water users and were knowledgeable about WUA regulations (Wegerich, 2000). While there are many factors that impact the variability of awareness, Wegerich (2000) hypothesizes that the differences between the communities may be due to the perceived need for the WUA. In the communities where farmers were more aware of the WUA, the canals and ditches were extremely deteriorated and the WUA was seen as a way to organize the funding and construction needed for repairs. In the communities in which farmers were largely unaware of WUA, there was less pressing demand for infrastructure improvements (Wegerich, 2000).

Sehring (2005) points out in a case study of a WUA in northern Kyrgyzstan, that “the cases where farmers totally do not know about WUA are rare – just as rare are cases where farmers know exactly what the WUA is. People in general know that there is some organization responsible for water, because somebody comes to them to collect fees” (p. 35). In addition to farmers’ limited knowledge, Sehring (2009) also points out that leadership’s knowledge of WUA functions and regulations also vary:

The Water Code and its concrete application rules are widely unknown, not only among the population (the water users), but also among the respective bureaucrats. The water users and agencies concerned do not have sufficient information on the law or their rights and obligations and therefore do not know how to apply it and how to make use of their rights. (p. 69)

This limited access to information about the WUA decreases its ability to function as the organization responsible for irrigation water distribution. When farmers or officials do not have access to information about fees, schedules, and contracts, it becomes difficult if not impossible to regulate use. Further, without access to information, farmers remain unaware of the participatory structures, their rights, and their responsibilities as water users.

WUAs in Batken, Kyrgyzstan

Because WUAs vary greatly throughout Kyrgyzstan, it is important to establish the specific structure and characteristics of WUAs in the research area. Therefore, the following section will discuss geographical influences, functions of WUAs, and trends in information access and participation in the research areas in Batken, Kyrgyzstan while placing these issues in the regional and national context described above. This will include information from interviews from farmers, WUA officials, and village leaders, as well as regional data to illustrate WUAs.

Independence and land redistribution in Batken oblast

As was the case around the country, the redistribution of land throughout Batken was marked with inequalities, as leader in Batken city stated:

Our government was mistaken in this [redistribution] process. Some farmers could take a bigger piece of pie and get 10 hectares of land. There was nothing left for the ordinary farmer. It was not a fair distribution because one person could get five hectares of land and one person could just get 30 *sotka*¹⁰. Do you see this big difference? The people who worked in a government position could take better land, and the rest of us were given six *sotka* per person. There are people who were not given any land at all. The people who were better off got land with canals that were already built. They got the land that was already cultivated by the government.

The repercussions of this redistribution continues to be felt by farmers who received smaller plots of land, uncultivated land, or land with little or no water. As one farmer in Byjum reflected: “[After the collapse of the Soviet Union] our crops dried up because of the water shortages. Our work stalled...my son lives south of here and he never planted crops because there was no water on his *ylysh*.” These research areas reflect countrywide trends in the redistribution process.

While it was meant to return the land to people, in many cases it served to support existing

¹⁰ *Sotka* is a Russian measurement equaling 1/100 of hectare.

power structures and inequalities. By giving productive land to powerful individuals, it exacerbated already existing disadvantages by denying others the asset of productive land.

In the years following the collapse of the USSR, the newly formed government lacked the needed resources to regulate and organize public services and infrastructure. This caused conflict in communities throughout the country including in the research area, as the village leader in Byjum remembered,

In the beginning [of independence], we could not plant crops because we could not come to a compromise. There were water conflicts and land conflicts and conflicts over equipment and conflicts over fuel. It was the time of transition and it was quite difficult...there was not enough water. Anyone could just close the water gate. Most of the land was not cultivated.

For irrigation water specifically, the lack of regulation allowed farmers to close or open water gates when they wanted or needed to irrigate their land. Without community cooperation, this unregulated use caused inefficient and unequal water use. Conflicts surrounding water use were exacerbated by the deteriorating infrastructure and the subsequent inefficiencies. As a village leader in Kyzyl-bel noted, “Those canals are left from the Soviet regime. Now all of them are broken and damaged as 50 or 60 years have passed since their construction.” This lack of regulation and the need for reconstruction and maintenance of the canals were motivations to establish WUAs as they could be avenues for both international donor support and community funds needed to improve the infrastructure. WUAs also provided an organizational structure and staff to promote efficient irrigation, monitor water use, and support community decision making.

Overview of WUA staff and functions

While the first WUAs in the country were established in 1995, as described above, officials in Batken cite dates as late as 2002 for the establishment of WUAs in the Batken oblast,

and some areas in the oblast continue without a WUA. While each of the research areas do have a functioning WUA, staff and roles of WUAs vary according to finances available in the area, the needs of the area, and the decision of the leadership regarding what positions to fill (see Table 4).

Location	Total Staff	Director	Accountant	Hydro-Engineer
Byjum	3	1	1	1
Batken City	6	1	4	1
Kyzyl-bel	2	1	1	0
Kadamjai	12	1	5	6
Doctuk	5	1	1	3

In the research areas, the director calculates the amount of water each farmer will receive according to crop type and the size of the cultivated area. The WUA creates a contract with the farmer, who can choose to either pay their account in its entirety at the beginning of the season or an agreed upon percentage at the beginning of the season and the remaining charges after harvest. Each research area distributed water using this method except for Doctuk, where the WUA did not charge by amount of water, instead, this WUA charged 25 *som*¹¹ per hour of water.

Directors also hire and manage the other staff and facilitate meetings. Accountants are responsible for calculating ISFs and managing the farmers' financial accounts. Hydro-engineers' job varied among the research area but they were generally responsible for managing the primary canals. *Myrabs* are hired seasonally (and not included in Table 4) to distribute the water by

¹¹ At the time of writing, 25 *som* is 0.36 USD.

opening and closing water gates, and collect ISFs. The average ISF in the research area is 7.54 *tyin* per m³ of water, the highest in the country (ADB, 2011).

As is the case throughout the country, transitioning to the payment of ISFs has been difficult for the farmers in the research areas who remember farming in the Soviet Union when the state provided water and infrastructure maintenance. As the *RayVodkhoz* director stated, “It is difficult to gather payment for water from people because in the Soviet Union everything was free and no one paid for water.” The Batken accountant also expressed the difficulty in collecting ISFs from the farmers and attempted to improve collection rates by educating the farmers about how the money is used.

The message we want to deliver is that we do not sell you the water, we provide you with the service and you pay for the service. In Kyrgyzstan, the water is not sold. The money that you pay, some of the money goes to WUA salaries, some goes to the construction of internal canals and some percentage goes to local *myrabs*.

While collection rates are improving, the current lack of funding impacts the WUA’s ability to invest in infrastructure maintenance and equipment, or pay staff. This also highlights an inconsistency in how officials define ISFs and how farmers view ISFs. As noted above, this official clearly states that ISFs are not payment for water. However, farmers communicated an understanding that they are indeed paying for water. One member said that she “pays for the WUA services” but the majority of the farmers communicated that the price was to pay for the irrigation water.

Low collection rates mean that there is limited funding for infrastructure maintenance or purchasing equipment. This can further decrease water use efficiency as an increasing amount of water is lost through deteriorating canals. Further, lack of funding for staff decreases the capacity for WUA staff to monitor water use, mediate conflicts, and conduct outreach to inform farmers

about WUA roles and functions. For example, the director in Batken was hoping to extend the accountant's employment through the winter so that he could communicate with farmers in the off season about the WUA and their accounts.

It is essential for us to work directly with farmers because they are not aware of the new system. They find the WUA unnecessary and therefore they do not work with us. So I think we should work directly with the people to make sure that each household knows the function and existence of the WUA and the WUA law. But that means we need to work in winter season. We should go directly to each farmer's house. We should make a contract and find out what the farmers want to harvest next year, what kind of crops do they want to have, how many hectares or how many *sotkas* of land they have. And only then will WUA law will be successful.

As the director mentions, this outreach can address the limited access to information among farmers by informing them about regulations, payments, and the purpose of WUAs. Without payment of ISFs by water users, it becomes difficult for staff such as the accountant to receive a salary beyond the growing season. However, as seen in the quote, the winter months can be an opportunity for WUA staff to conduct outreach as farmers often have more time available and are preparing for the next season.

Geographical influences on WUAs in Batken oblast

The research areas are each located in Batken oblast, the southern-most area of Kyrgyzstan. This location means that their borders with Uzbekistan and Tajikistan as well as their distance from the administrative centers in the capital city influence the WUAs. Further, this research suggests that the WUAs in the research sites vary in capacity and access to resources.

First, Batken oblast is the farthest oblast from the Kyrgyzstan's capital and its administrative resources. The cultural and linguistic differences between the north and south can also act as a barrier for the transfer of ideas. The north, and specifically the areas around the

capital of Bishkek, have a greater Russian influence both linguistically and culturally. In the south, the predominant language is Kyrgyz and is impacted by its borders with Tajikistan and Uzbekistan. This distance and difference may have been factors that influence the late establishment of WUAs in the research areas.

Second, transboundary rivers and shared reservoirs can create tensions at the borders in the south. Indeed, each of the water sources in these research areas are shared between neighboring countries. Specifically, the Aksu river flows through an Uzbek enclave before reaching Kadamjai city, a portion of the water in the Tortgul reservoir is allocated to Tajikistan, and Karrakum reservoir is located Tajikistan but also serves the Kyrgyz border villages. This allocation can create a tension was revealed in respondents' accusations of neighbors or comparing water access with their water on the other side of the border. For example, one respondent in Byjum theorized that it was Uzbek neighbors who blocked the river flowing into her village: "At the head of the Sokh River, someone blocked the canal that was coming to our village. There is a huge stone that blocks the water. Maybe the Uzbeks [blocked the water]?" With frustration, another spoke about the amount of water going to neighboring countries. "We have plenty of water from the rivers, but they all just go to Uzbekistan and Tajikistan and we just use a small percentage of all this water. In one village, the access to water was blocked...but they were told not to touch it because [the water] was sold to Tajikistan. How can they sell water to others when we do not have enough for ourselves?" Further, for the farmers living at the Tajikistan border in Doctuk, it can be easy to compare water access and availability between neighbors and countries:

We are very confused because in comparison with Tajikistan we only have one small canal. The Tajik people have two canals. On the Tajik side, the water never stops. But the water that comes to our village stops frequently. They make excuses like the pipe is not

working...Our tiny canal always breaks and people have no water. The Tajiks have two huge canals. If you see our crops, they are gray. The Tajik side is green. I don't know why their pipes never break. It is ours that breaks.

Another respondent in Doctuk spoke not about comparison, but about the need to continue good relationships with Tajikistan, as her village receives water from a reservoir in Tajikistan. There is an electric pump to transport the water to their village, and she knows that her water security depends on the water from across the border and the electricity that transports it to her country and then her field. "When the electricity is off in Tajikistan, we have a lot of problems with the water. If Tajikistan turns off the electricity, these three villages do not have water. That is why we should have a good relationship with Tajikistan." This response illustrates, on an individual level, the need for transboundary cooperation in water management in order to protect water security.

Variance in WUA capacity

Among the five research areas, there were signs of differences in capacity of the WUAs demonstrated by the resources available to the WUA and farmers in the area. While the ability to manage water does not rest fully on these resources, it can influence the WUA's capacity to effectively distribute irrigation water as well as the ability to provide outreach and trainings. This in turn can influence water security, WUA participation, and access to information for the farmers in the area.

Kadamjai city, the closest research area to the south's urban center, was the only research area in which farmers mentioned trainings on irrigation management. Their knowledge about water conservation seemed to be connected to the trainings they have recently received, as described by a member in Kadamjai:

This year we studied with specialists from [the urban center] who taught us how to use water. For example, before we would irrigate for an entire day, but now we know to only irrigate for four hours because we learned how to use it more efficiently.

In addition to trainings, this WUA received an excavator and tractor on credit from USAID and according to both farmers and the WUA official in the area, this equipment has increased their ability to maintain the infrastructure. Further, Kadamjai's WUA had an office equipped with computers for their staff, which has supported the organizational capacity and record keeping ability for the WUA. This access to equipment and trainings for their farmers increases this WUA's capacity to fulfil their role to manage and distribute irrigation water in their community.

While Kadamjai had access to these resources, the other WUAs' resources varied. At the time of data collection, the WUA in Batken city had just moved into an office space. They also owned a tractor. Byjum's WUA rented an office but was hoping for the funds to purchase an office in the near future. None of the WUAs except for Kadamjai had computers and Doctuk's WUA did not have an office space. Neither did any of the other WUAs report trainings on irrigation management. These differences were clear to the director in Byjum, who expressed frustration at the lack of equipment and resources available:

[Other WUAs] have been provided with cars, tractors, or excavators because they have been working with [international donors]. But we don't have any projects here. Our canal was built 1976 so it is very outdated. We don't have a budget to purchase anything new. Most other places have a computer, but we don't have one at all. But it is always required that we have typed forms! We don't even have our own office, now we rent an office. But we are negotiating with the village council and they promised that in the future they would give me an office.

This illustrates that the capacity of the WUA varies is somewhat dependent on the support of the village council as well as the existence of international projects that can collaborate with the WUA to invest in equipment. Independently, at least in Byjum, the WUA is unable to access these resources. Equipment can relieve some of the burden of manual labor needed to clean

canals and an office space an increase visibility of the WUA in the community. Further, trainings can increase the access to information for farmers in the area. Conversely, lack of equipment and resources can significantly decrease the capacity of the WUA to distribute and manage water effectively as maintenance and organization can be more time consuming and less effective without updated equipment. This limited capacity can also hinder the WUA's ability to provide information for farmers.

Access to WUA information

As shown in other studies conducted throughout Kyrgyzstan, differences in information access were reflected in each of the research areas. Some farmers were unaware of the existence of the WUA, while others regularly attended meetings and knew the water use regulations. For example, when asked about WUA involvement, one respondent in Kyzyl-bel replied, "We don't have a WUA in our village. They operate in big cities like Batken but we are on the edge of Batken city." There is, in fact, an operating WUA in this respondent's village. One respondent attributed water distribution to the *RayVodKhoz*, the regional water management authority rather than the WUA and some attributed irrigation management to a vague idea of "the government."

Respondents often attributed the role of water management to the local *myrab* but did not know they represented a larger organization. As the *myrabs* are a part of the WUA, this awareness is an element of knowledge of the WUA and can improve farmers' access to information about schedules and fees. Further, knowledge of the *myrab* gives farmers access to an authority figure in irrigation management who has the potential to mediate conflicts, advocate for improved conditions with decision makers, and resolve water issues in the community. Some respondents reported that the *myrab* was key to conflict mediation and ensuring water access.

For example, a respondent in Kyzyl-bel commented on the ways her *myrab* works with the people:

[The *myrab*] makes a schedule and usually watches to make sure that crops do not dry. He does not sit at home but goes around the village in order to make sure that no one is complaining... We communicate with the *myrabs*. Everyone has his cell phone number. The *myrab* has his own notebook where he assigns every farmer his own turn: at what time and date each farmer will get water.

Another attributed the decrease in water conflicts to the *myrab*'s role in the community:

There are no conflicts since this *myrab* has been hired because he makes sure everyone takes their turn. He was hired two years ago. We changed the one that was before him because there were lots of conflicts and fights about water. We hired a person who lives nearby and who can control the water.

For these farmers, communication with the *myrab* was beneficial for conflict mediation and water access. However, for many farmers, this knowledge rarely extended past the *myrabs*' role of collecting ISFs and monitoring the irrigation schedule. Specifically, as shown above, many farmers did not know the purpose of ISFs or how this money was used. While many respondents knew the *myrabs* and perhaps even interacted with them on a regular basis, this information did not guarantee knowledge of their rights or opportunities to participate. This keeps them from assessing financial records, voting, running for leadership positions, and approving irrigation schedules and ISF amounts. Thus, instead of having a voice in the decision making process, these farmers comply with decisions made by leaders and participating members.

Participation and inclusion in WUAs

Limited access to information about WUA regulations and members' rights can deny farmers the opportunity to participate in decision making processes in the WUA. While some expressed this exclusion in frustration, others did not necessarily disagree with this method of

centralized decision making, as they thought if all farmers were included it would be difficult to make decisions. As one respondent reflected:

We do [have meetings] but it is usually *myrabs* who participate. Usually it is through the *myrabs* that people know about decisions. They do not invite people for the general meetings, because many people can easily quarrel. Usually people do not go to those meetings. They invite relevant people who work with the WUA and that is how they make decisions.

This respondent did not express frustration at the exclusion from the process; rather she was pleased with how the WUA staff were performing:

The hydro- engineer works very well. The previous ones were not that good so we had a hard time with water. But thanks to God, the current staff works well and he manages to supply enough water. It has been good for two years... The *myrab* makes a schedule and monitors the area to make sure that our crops do not dry.

While this respondent had no desire to participate, this decision making process in which few individuals are invited to participate does not reflect the inclusionary language laid out in the Water Law, instead it seems to reproduce aspects of the centralized decision making of the Soviet Union. While the farmer above was content with the exclusions, others expressed frustration at the lack of inclusion in decision making.

We do not usually join them, our village officials can decide by themselves. They don't include people... We never hear about [the meetings], no one tells us! We need to honestly address this issue. They usually just organize the meetings for themselves and decide things for themselves... Those who work in the office only included themselves.

In contrast to the respondent who felt that the exclusionary participation created efficiency in problem solving, this respondent felt that the exclusions needed to be addressed and changed. This difference may be due to the perceptions of WUA performance; when a farmer is satisfied with WUA work, they may choose not to participate in the decision making process, as was the case for the respondent above. In contrast, when their water needs are not being met, farmers may respond with frustration at exclusions.

In some cases, farmers are indeed informed of meetings, are included in the decision making process, and choose to participate. Farmers report attending meetings and discussing ISFs, schedules, and conflicts. One farmer described the meeting as a time to plan for the coming year while debriefing the previous year:

We listen to the staff and if we have the money, we pay for water. They make a schedule and we sign up for our turn. They tell us how much to pay, how much debt we have from the previous year, and those who did not pay receive warnings. We discuss any difficulties that we had... We also discuss the results of the previous year, who received his water on time, who did not, and what went wrong with the schedule.

For the farmers who choose to participate and are included, these meetings are places to exercise their rights as members while receiving information that will allow them to make informed decisions about irrigation in the next season. Further, these meetings can become places that facilitate empowerment of individuals and communities as their voices are heard and they work together to effectively manage the water and infrastructure.

In addition to meetings, farmers can participate in the WUA through contribution to *ashar*. Depending on the WUA, this labor is seen as an in-kind payment of ISF, a voluntary contribution to the community, or a requirement in addition to monetary ISF. While *ashar* is traditionally based on the volunteer labor by the community, respondents did report repercussions if they did not participate. In some cases, participation in *ashar* was required for water access:

[My family] goes to *ashar* when it is time to clean the canal. In the spring you have to clean the canal if want water on your crops. If you do not go to *ashar*, you do not get water. Therefore, you need to devote at least one day to *ashar*.

In some cases however, water will not be completely denied, instead, according to a WUA hydro-technician, farmers who do participate in *ashar* may receive preferential treatment by the WUA during a dispute: “If farmers do not come to *ashar*, during water conflicts they will not

get water.” When a farmer was asked how long this communal sanction might last if they did not attend an *ashar*, she responded, “Until the *myrab* forgets about it.” This ambiguity makes it difficult for farmers to trust the equality in the repercussions as some farmers may receive harsher or longer ramifications than others. Despite the consequences, participation appears to vary by community. One director estimated that 70% of households participate in *ashar*, but another stated that nearly all households regularly send a representative to *ashar*.

This involvement in *ashar* and payment of ISFs points to a level of awareness and participation in WUAs by the farmers who contribute to labor and pay the *myrabs*. However, even farmers who pay and work with the *myrab* do not necessarily know about the WUA as an organization nor do they have information about their rights. This means that despite their contributions of finances and labor, they are denied the rights given to them in the Water Law including voting for leaders, approving budgets, and filing complaints. Therefore, when farmers remain unaware of the WUA organization and their rights as users, WUAs become exclusive institutions with a small number of powerful decision makers rather than a space for community members to contribute to decision making in an inclusive environment.

Conclusion

Water use and irrigation policies in Kyrgyzstan have been influenced by the transition from traditional water management to the centralized policies of the USSR and finally to current WUA policies. Following the collapse of the USSR, WUAs have been established to manage irrigation on a local level, but their capacity varies and limited access to information as well as barriers to participation inhibit the realization of farmers’ rights as water users. In the midst of failing infrastructure and environmental concerns, however, efficient and equitable irrigation distribution is vital, making WUAs’ functions significant to the livelihoods of the farmers in

Kyrgyzstan. It is within this context that the following chapter will discuss women's participation in WUAs in particular. For while limited information and exclusions impact all farmers, women face specific barriers information and inclusion in participatory processes.

CHAPTER 4

INTERSECTIONALITY IN ACCESS TO INFORMATION AND PARTICIPATION IN WATER USER ASSOCIATIONS

Despite their use of and dependence on natural resources, women face specific barriers to participation in natural resource management. These barriers are demonstrated in female farmers' access to information and participation in WUAs in Batken, Kyrgyzstan. The exclusions are not based on gender alone; rather their access to information, inclusion, and participation in WUAs as users, members, or leaders are influenced by the intersections of gender, age, geographic location, and class. Further, women's participation is not solely based on limited information or exclusions as female farmers also strategically choose how to participate in the WUA. This chapter will examine these influences by first presenting the demographics of the respondents and a discussion of female farmers' roles in irrigation in the research area. It will then discuss the determinants of participation followed by the benefits and challenges of the types of participation by user, member, and leader. Finally, this chapter will examine the influences of age, class, and geographical location on women's participation as users, members or leaders in these WUAs.

Respondent Demographics

While this research draws largely from in-depth interviews, it is beneficial to establish the demographics of the respondents. As indicated, the data for the analysis is drawn from interviews with WUA officials, village leaders, and female farmers throughout five WUA service areas in Batken, Kyrgyzstan (see Tables 1 and 2 and Figures 1 and 2 in Chapter 1). In order to understand the identities of users, members, and leaders interviewed in this research, Table 5 displays

selected demographics by type of participation type. For data separated by study area, see Appendix B.

The average age of the respondent was 46 years old. Largely due to the cultural respect for elders, age was weighted towards older farmers as it was usually expected that the interview took place with the oldest female in the household. Younger women were usually less willing, or had less available time to participate in the interview. The average household size of respondents was 5.7 persons, nearly reflective of the regional average of 5.3 (Population, 2009). Average land owned by respondents was .95 ha, less than the regional average of 1.7 ha (ADB, 2013). All of the respondents had completed secondary school and nine (18%) had graduated from or completed some higher education. All of the respondents identified as ethnic Kyrgyz, though two households had recently moved back to Kyrgyzstan from neighboring Tajikistan. One of these families had obtained Kyrgyz citizenship and one had not yet received the needed documentation to apply for citizenship.

Of the respondents, 20% held a *de jure* head of household (HH) status. Largely due to the frequency of the labor migration of men, 8% held *de facto* HH status while their husbands were working in urban centers. This total is nearly reflective of the national data that estimates that 27% of the households are headed by females (World Bank, 2016). For the purposes of this research, *de facto* HHs are those households where the male head is absent or otherwise unable to act as HH for the majority of the irrigation period. *De jure* HHs are those headed by widows or unmarried, divorced or separated women.

As shown in Table 5, the majority of the respondents are users, or farmers who utilize irrigation water but do not participate decision making and management in the WUA. For the purpose of this study, WUA members are self-identified members who pay ISFs, attend WUA

meetings, and are aware of WUA roles and regulations in the community. A leader is a respondent who holds an official position in the WUA. Non- participants were respondents who did not use irrigation water. On average, leaders were older than members, who were older on average than users. Similarly, leaders owned more land than members, who owned more land than users. Causes for these trends may vary and as this study did not employ random selection, it is not representative of the population. However, the influence of age and class (as indicated by land tenure) on WUA participation is confirmed by the qualitative data.

Table 5: Selected Demographics of Female Respondents

	Total Number of Respondents	Household Status			Average Age	Average Land Ownership (ha)	Average Number in Household
		De jure HH	De facto HH	Household Member			
WUA Leaders	2	1	0	1	58	3.15	5
WUA Members	9	1	1	7	52	1.3	6
Users	35	8	3	24	45	0.83	5.7
Non-users	5	0	0	5	33	0.42	5.2
All Respondents	51	10	4	37	46	0.95	5.7

Gendered Divisions of Labor in Irrigation

In the research areas, both officials and farmers agreed that the traditional division of labor dictates that irrigation is men's responsibility. As one farmer from Kyzyl-bel said, "Women do not work [in irrigation]. Men alone find a common language between them and irrigate the land. We women do not meddle in this." Another respondent in Batken city described the division of labor between herself and her husband: "I am not concerned with irrigation. My husband does the irrigation. When the apricots are ready to be harvested, then it is my time to work." This division of labor in which the male figure is the primary manager of irrigation and

the females of the household manage the harvest was common in the respondents' answers. It was also confirmed by the male city quarter leader who asked, "Why would women irrigate if there are men who can do it?" This illustrates the division of labor in the research areas that assumes that men will manage the irrigation.

Whether real or perceived, this study suggests that the division of labor is influenced by the idea that men hold the skill, knowledge, and physical ability needed for irrigation management and labor. As the WUA hydro-engineer in Doctuk said, "Mostly men participate. Women do not understand the issue of water management." Some of the female farmers themselves also accepted this, as one respondent communicated that she did not know about irrigation methods saying, "I don't have any skills in irrigation, my husband goes to all the meetings to get water. He is responsible for deciding how many hours we should have." In addition to a lack of knowledge, the male WUA director from Byjum said that women lacked the physical strength needed to irrigate. Specifically, he thought they were not strong enough to open the water gates and therefore, could not participate in irrigation labor. This reasoning was also shared by a female farmer: "Women are unable to participate in water issues because we cannot open the water gate. Managing water is difficult. We can't go to the head of the canal and we can't get access to water." This perceived lack of knowledge and strength needed to irrigate contributes to a context in which men often irrigate and make management decisions regarding irrigation.

While the interviews suggest that when men are present, they do indeed do all or part of the irrigation labor, the study identified several instances in which women contribute to both the labor and management of irrigation on their land. This study suggests that women frequently participate in irrigation labor. Even in cases where it was the man's responsibility, women often

assisted. For example, some irrigated alongside their husbands, as did one farmer from Byjum who, when asked if irrigation was indeed too difficult for women, laughed and said “Of course, it is difficult! But we have to do it!” The village head in Byjum also noted the involvement of women, stating, “both men and women pick up their hoes and irrigate.” Further, for members who have a specific time in which they have to irrigate, the responsibility often falls to any household member who was available at that time, as described by a farmer in Kyzyl-bel: “When it is your turn you have to irrigate, or you will lose your turn. I can irrigate, my husband, my son, anyone who is home.” Still other respondents took full responsibility of irrigation labor and management when necessary, often due to the absence of the husband because of labor migration or death, or other factors such as disability that rendered him unable to manage irrigation.

The traditional gendered division of labor has been challenged through the changing demographics in the region due to labor migration. In the research areas, it was common for men to move to an urban area for work, causing one respondent to report that her village had “a deficient of men.” Indeed, it is estimated that 68% of labor migrants from Batken oblast are men (Osmonaliev, 2009). This labor migration has caused many women to take on the irrigation responsibilities. When asked about who is responsible for irrigation, one widow in Batken city responded, “Just me. My son frequently goes to Osh, Jalalabad or Bishkek to work.” This was confirmed by another respondent in Kyzyl-bel who reported that, “Mostly women whose husbands are working in the city or who are widowed, they do the irrigation labor. If my husband is working, I will do the irrigation.” The changing demographics were acknowledged by the Kadamjai accountant who stated that now “there are more female farmers because men are away working.” However, when asked how the WUA was adapting to this change, there was no clear

answer, illustrating that the acknowledgment of a demographic shift has not yet translated into institutional changes to increase the inclusion of women in the WUA.

In addition to labor migration, this study revealed that women also step in to do irrigation labor due to the disability or death of the husband. This is illustrated by a widowed farmer in Kyzyl-bel who said, “Because there was no man at home, it was my responsibility to irrigate the land. Not only men irrigate, women also do. When my son was small, I did it by myself, but now he has started to irrigate on his own.” Specifically, it appears that in this situation, the widow irrigated in the absence of a male figure, but when there is a male in the household able to irrigate, in this case, her son the role was given to him.

These situations reveal that while irrigation is often a man’s responsibility, women do indeed work in irrigation in the research area, despite assumptions that women do not have the strength nor knowledge for irrigation management and labor. In some cases women contributed to the labor alongside her husband and in circumstances in which women were *de facto* or *de jure* heads of households, these female farmers often took full responsibility for both irrigation labor and management.

Determinants of Participation

Access to information

Based on the interviews with female farmers, there was low access to information about WUA’s existence, roles, and functions. Specifically, 63% of the respondents did not identify nor recognize the WUA as the governing body responsible for irrigation water distribution and infrastructure maintenance. Instead, when asked about the management of their irrigation water, some attributed it to the village council or the *RayVodKhoz*, the governmental body over the

WUA. As shown in the previous chapter, this is reflective of the lack of knowledge of WUAs throughout the country (Ajibekov, 2015; Sehring, 2005); however, the gendered division of labor in the Kyrgyz household also influences women's access to information. For women whose husbands or other male figure act as head of household, they may not know about the WUA because they do not need to know; irrigation is not their responsibility and therefore information about the WUA may be unnecessary.

Nevertheless, this study suggests that the assumption that women do not irrigate does not hold true in all circumstances, especially in situations in which women are the *de facto* or *de jure* head of household. However, their status as household head did not appear to increase their access to information. For instance, in this study, a widow with one daughter was unsure if her community had a *myrab*. She did indeed live within a WUA service area with a *myrab*, but with no husband, son, or other male representative, she did not have access to the information about the WUA in her community, despite her role as head of the household and irrigator:

I do not know about water issues. Maybe we don't have a *myrab*? Maybe I do not know who the *myrab* is because my husband was responsible for that. It has been two years since he died and it is difficult. I have to look after my apricots otherwise they will dry up. We have to bring water from very far because if there is no water, there is no life.

Despite being the head of the household and responsible for irrigating her orchard, this user did not know about the WUA or the existence of a *myrab* in her community.

For some users, their limited access to information does indeed seem to be a barrier to their participation in the WUA. For example, a farmer in Kyzyl-bel stated, "I heard there was [a meeting] last year. But I am mostly at home so I did not hear about it until after it happened so I could not attend. If we hear about them and they tell us we can go, I would go." A farmer in Byjum similar commented, "If there is an opportunity of course I would participate. If there is a

problem with water, we want to make our own contribution to solve those problems.” For farmers such as these women, they have a desire to participate in the WUA but their low access to information hinders their ability to participate.

This limited access to information may be in part due to the limited outreach done by the WUA. There did not appear to be a standard way in which information was made available in the research areas. For instance, one user in Kyzyl-bel reported that she would hear about meetings from her children who would learn about it at school. Others described that they would learn about a meeting when talking to others in the village center. Similarly, most of the officials could not report concise outreach methods; rather they would personally tell the farmers when a meeting was going to happen. There were brochures about the WUA in each of the offices, and the WUA in Batken city did publish a news article and a radio broadcast about the WUA. These methods are effective in reaching some farmers: those who read the newspaper, frequent the village center, or are in contact with the WUA staff are able to access to the information. Nevertheless, for those who do not go to these sources for information, the lack of consistent methods of informing farmers about meetings hinders the farmers’ access to information about the WUA.

Gendered exclusions

This study suggests that in addition to limited access to information, women’s participation was impacted by the traditional segregation by gender that is prevalent in Kyrgyzstan and more common in rural communities such as the research areas. For example, one respondent in Byjum described the segregation in *ashar*, stating, “Only men participate in *ashar*. We are not allowed to participate. I do not know why, but women do not participate. It is a shameful if we do.” Officially, the household representative in *ashar* does not have to be male,

but according to social norms, women do not generally participate, as described by a WUA director:

In early spring we [have *ashar*]. We slaughter an animal and we go to the mosque to decide what date we will clean the canal. I give them money to pay for the lunch for the men who clean the canal... every family should send someone. If the father cannot come he should send his son.

This was confirmed by farmers and officials alike who stated, as the quarter leader in Batken did, “Women just do not participate in *ashar*.” This may be because cleaning the canal is a physically strenuous task, and according to the assumption that women do not have the physical strength to irrigate, it may be assumed that women do not have the strength to clean the canal. This exclusion may not negatively affect women with male family members who can represent their family at the *ashar*. However, officials and farmers reported that participation in *ashar* can be a mandatory prerequisite for the *myrab* to give you water. In other cases, the officials will give preferential treatment to those who contributed to *ashar*. Thus, women who do not have a male representative and are excluded from participating due to gendered exclusions are at a distinct disadvantage in securing water through the WUA.

In the WUA structure, the position of *myrab* is the main connection between the WUA and the farmers, but in the research areas there were no female *myrabs*. Due to traditional segregation by gender, this can be a barrier to female farmers’ ability and willingness to work with the WUA. As one user said, “I do not work with the *myrab*. Maybe because I am a woman. I am too shy to talk to males.” This barrier to communication with the male *myrab* could hinder female farmers’ ability to ask for needed information about the WUA, negotiate irrigation schedules, or request the *myrab*’s help in conflict resolution.

These exclusions may cause particular difficulties for women who are head of their household. For one user in Byjum, her head of household status was due not to the labor migration or death of her husband, but because he was unemployed and suffered from alcoholism.

My family situation is bad. I have five daughters. I have a husband who is unemployed. He does not work at all. He is an alcoholic. If he drinks once he will keep drinking for days and days. Then he rests for a week and starts drinking again. We have no livestock because my husband does not work.

Without sons to act as a representative in the WUA, she irrigated as a user, often irrigating at night to avoid the *myrab* and other farmers.

Basically, people don't give water to the women without husbands, those whose husbands work as labor migrants in Russia. This is the main problem. Others can negotiate to get the water first. Families with men, they can oversee the distribution of water because they can close the water gates and get water for their own orchards... Because we are not participating, we are left behind by the men who monitor the water. We have to irrigate the land late at night and instead of sleeping, we get water.

This user felt that she was unable to secure access to water because she was excluded from the formal means of participation due to her gender and time poverty. Therefore, she relied on informal and less secure means of obtaining water without paying or consulting the *myrab*.

For women who do take on the irrigation labor as users, irrigating at night is a common way to gain water access against WUA regulations. While the user described above may have been using a less secure means of irrigation, she was able to avoid paying ISFs by irrigating at night. For some, this seemed to be the preferred way to irrigate; they can avoid payment and irrigate whenever there was water. Others saw it as a necessity to gain a sufficient amount of water, as did one user in Byjum: “[We irrigate at night] because of the lack of water. There is not enough water, if we do not open the water gates our plants will be dry.” These users do not

follow irrigation schedules nor pay ISFs to the WUA; instead, they may irrigate at night or change the water gates to divert water into their fields.

Choice

While some farmers may desire to participate in the WUA if given the opportunity, other users choose not to participate. These users know about the WUA and some had even previously participated but choose to irrigate as users outside of the WUA structure. This study suggests that this choice is influenced by the time and energy needed to participate and the lack of benefits they receive from participation. This can be a strategic choice based on the benefits gained and challenges avoided by their choice.

First, farmers may choose not to participate due to the time and energy required for membership. As one former member said, “I used to be a member. But not now. I don’t have time to be in WUA...I am tired and just don’t have time.” Instead of attending meetings or working with *myrabs*, they choose to irrigate as users and invest their time elsewhere. This may be a significant influence for female heads of households who often have increased responsibilities, as reported by a user from Byjum who stated that “we, the women who have to endure the burden of being the breadwinners, we cannot participate because we have other household activities that we have to complete. We do not have husbands, our children are young.” Women who are members of the household may also choose not to participate due to their responsibility for work within the household. As one user said, “I need to stay home with my children; there really is no time to participate in the WUA.” Still others who work outside the home also may choose not to attend WUA meetings, as shown by this user in Doctuk who stated, “I am tired when I come home from work and sometimes the meetings occur when I am

working. So I don't want to go [to the meetings]." For these users, they may not participate because they are unable or unwilling to invest time and energy into the WUA.

Users may choose not to participate, especially if they see no benefit to the WUA, as this user from Kyzyl-bel describes:

[The meetings] are no help at all. Many meetings were organized about land and about water, but no one ever came to see the situation at our house. Everyone is just concerned about themselves. They don't care about poor people.

This opinion that the leaders of the WUA are not focused on the members was shared by a paying user in Leilek who had attended meetings in the past, but decided to stop attending.

We discussed water issues [at the meeting] but the officials don't care. There is no one who can monitor the water to make sure things are working correctly. Officials say they are here to provide access to water. But they don't care. All they care about is money and we are the last thing they care about.

This perception that the WUA prioritizes money over the community has influenced this farmer's decision to irrigate as a user. She does not see the WUA as an organization that benefits her and so while she continues to pay ISFs, has stopped attending meetings. For some, this choice seems to be an act of independence to convey their ability to maintain water access outside of the patriarchal system that does not benefit them as irrigators. As one user said, "No, I don't even want to go to the WUA! I will get water for myself, by myself." Instead of participating within a system that often excludes them as women, these farmers choose to act outside of the WUA and irrigate as users.

Types of Participation in WUAs

Users

Despite their participation in irrigation, 76% of the women interviewed who used irrigation water do not participate in a WUA. Of these 35 users interviewed, 62% of them had a male member of the household participating in the WUA as representative of their household, and the remaining 38% used irrigation water without any household member participating in the WUA. Whether due to limited information, exclusions, or choice, this participation does hold both challenges and benefits.

User benefits

In addition to saving time and energy as described above, users can save money by irrigating as users. For despite users' informal access to irrigation water, this study shows that users can secure water access while avoiding ISF payments. Specifically, when asked if they had access to a sufficient amount of water, 50% of water users responded that the amount was sufficient. This is often due to their ability to negotiate with their neighbors to ensure water access without regular payments. As one user in Kyzyl-bel recounts:

Nowadays there are no difficulties. People understand each other and share the water. For example, if I plant crops today, I will give water to my neighbor. Tomorrow my neighbor will do the same for me so that our crops will not fail.

Another user reported that there is enough water due to their proximity to the canal and cooperation of the community:

Yes, for us, there is enough [water] because the canal is [nearby] and I am located up stream. Also, if someone is using the water to irrigate, he asks his neighbors if he can finish before they take the water and they agree. People cooperate here.

Because these users are able to gain access to sufficient irrigation water without membership in the WUA, the motivation to invest time and money in participation is low. Instead, they are able

to negotiate water access with their neighbors or ensure access due their close proximity to the canal.

Although users are required to pay ISFs according to the 2002 Water Law, enforcement of payment is reportedly low and without attending the meetings, users may be able to avoid payment (Serhing, 2005). These ‘free riders’ see it as logical way to irrigate their land while saving money.

If there is water at night, you should irrigate. We do not pay [for water]. We irrigate our land at night. When there is water, you can take it. When there is not water, but you need it, you just open the gate and change the direction of the water.

For these users who are able to secure water access without payment nor participation, they may choose not to invest time and money into the WUA. Instead of irrigating according to the WUA schedule, they irrigate when there is water available and thus avoid payment.

Challenges for users

While some users reported sufficient irrigation water, the other 50% of users reported that they did not have sufficient amounts of irrigation water. According to the farmers, the low access was exacerbated in the spring when there was a high demand for water but low availability as the snowmelt had not yet begun in the mountains, or during very hot weather. In these circumstances, the cooperation they often depend on for water access is limited. As a user in Kyzyl-bel reported, “When the winter ends and the spring starts then we have timing difficulties because everyone wants the water. There is not enough water and it does not come regularly.” As a user in Byjum reported:

The water is scarce when the weather is very hot. The apricots dry very fast. For example, when the apricot grows, if they don’t get water, they will quickly dry. Do you see the sun? It is very hot. Yesterday was very hot. And last year it was so hot, our crops dried up.

When weather causes the demand for water to increase, both members and users are negatively impacted. However, without regulated and scheduled access to water, this can add further stress to users' water security. Further, with water needs high in the community, the cooperation around water use may also be limited, as farmers each need to irrigate at the same time.

In addition to demand, some users attributed the lack of water to their location on the canal. That is, if they are downstream, the users upstream can decrease their water supply. For instance, this user downstream in Kyzyl-bel lacked support from her community, which hindered her water access:

I planted vegetables in early spring but there was no water. The water goes to many fields before mine and people did not allow the water come to me. I suffered a lot. All of my seedlings dried... They did not allow me to get the water. They blocked the flow and said I could get water somewhere else.

Without the cooperation of her community nor a beneficial location, this user struggled to maintain water access. This quote also shows that as a user, she was relying on her neighbors instead of the WUA. Therefore, when cooperation was low, she did not have regulated water access nor the structures in place to file a formal complaint. Instead of going to the WUA to protect her water rights, her seedlings dried from lack of water. Similarly, for another user in Byjum, the lack of membership and regulated irrigation eliminated her access to water in a conflict and ultimately, her harvest of apricots.

Last year, one of our neighbors did not agree to give us water. But everyone should have a right to get this water! He did not have the right to block the flow of the water. But I said to my husband, "If they don't want to give us the water that is up to them. If our orchards dry, they dry." We were left with no water at all and all the apricots dried. We just burned them.

Without the access to WUA officials who may be able to mediate conflicts such as these, users are left to attempt to resolve issues without regulations or the rights of a member. In some cases,

it appears that communities cooperate and users are able to irrigate without issues. In others situations, especially during seasons of high water demand, users may be unable to irrigate due to upstream irrigation and lack of cooperation. Because they are not members, they cannot rely on the regulation and authority of the WUA to protect their water rights.

WUA members

Of the 46 respondents who use irrigation water, 20% identified as members of a WUA. These members reported regularly paying ISFs, attending meetings, and communication with the *myrabs* and other staff. While this participation is an investment of both time and money, these members cite specific benefits to participation in the WUAs that encourage their continued involvement.

Benefits of WUA membership

While women may identify barriers to attending meetings, the farmers that are included and choose to attend name specific benefits to participation. Specifically, they cite timeliness in delivery and adequacy of amount of water as the benefits to membership. They also note the relevant information they receive in the meetings such as price of water, awareness of staff, and knowledge of the schedule, as described by a member in Kyzyl-bel.

I go [to the WUA meetings] to get adequate water. For example, in early spring, they organize meetings about canal cleaning. And they say if you clean the canal you will get water. Participation in those meetings is for our own benefit and to be informed about latest news, and to know the price [of water] . . . how the schedule is designed, who the *myrabs* are, and how many *myrabs* will be working here.

In addition to receiving information, members also have a chance to interact with the director and contribute to making decisions:

The director gives his report and we as members ask him questions... Decisions are made in the meetings: payments are established, how much water we will need, and how much one farmer should pay for the water.

These members communicated clear benefits to membership in the WUA: they are able to contribute to decision making processes, communicate with leadership, and receive information about irrigation.

Many of the benefits the members report are due to the ability to interact with officials outside of the meetings. For example, one member in Kyzyl-bel spoke highly of her WUA staff and credited her water security to their success:

The *myrab* in our area, the hydro-engineer, and the director are all good workers. We just talk with the *myrab* if there is problem. But if there are issues beyond his control we talk with the hydro-engineer. We call him and he will give us water on time. If we say that our crops need water he will give water by any means necessary. The staff work very well so the irrigation water is good.

This member also reported that the increase in organization by the WUA had improved water access and decreased conflicts.

Before [the WUA was established] it was chaos and we received a very small amount of water. If someone already received water, he could come again to get more water. But now, everything is organized and therefore we do not have any conflicts. Now people understand the system and we get water when it is our turn.

In contrast to the users who irrigate outside of regulations, the members rely on *myrabs* to enforce the schedule of the WUA to ensure their water access. This is described by a member in Doctuk:

Just this morning we had a conflict about water. My son went at our turn to irrigate but the neighbor did not allow him to get water because they said that they had gotten water for two hours from the *myrab*. It was also our turn so the *myrab* must have told two families they had water at the same time. My mother said "Go talk to the *myrab*, they know the schedule." So we went to the *myrab* and he fixed the schedule and the problem was solved.

For this member, her household's connection with the *myrab* allowed them to rely on his authority to mediate the conflict. Further, because they were irrigating within the WUA, they maintained their rights to water during the conflict. This reveals that for these members, connection to the authority figures and scheduled irrigation are beneficial to their water access.

It appears that in some cases, members are also able to negotiate their irrigation schedule with the *myrabs*. In contrast to the users who choose to irrigate at night to avoid the *myrabs* and other farmers, members have the benefit of asking to irrigate in the daylight.

In our village, sometimes people irrigate at night. It is dangerous for women at night but if you do not guard the water, someone will take it to their own land. They will steal it. That is why you have to guard it at night. But I have my husband and he will monitor it. The women without a man will get the water themselves with their children and in most cases they will ask the *myrabs* to get water during the daylight hours.

Similarly, it appears that members can negotiate their position in the irrigation rotation with the WUA, as described by this member in Kyzyl-bel:

We want to join a different irrigation group because we are at the end of the rotation for water and the ones who are before us can open the gates and change the water without permission. Then we do not get enough water when they go against the schedule. When the water has come to us, 14 farmers have used the water. We are fed up with it. So we are talking to the WUA about how to change our position.

Members such as this respondent may be especially interested in these changes as their amount of water can be impacted by the unregulated use ahead of them in the rotation. Consequently, they particularly benefit from the ability as members to negotiate with the WUA.

Challenges for WUA members

Despite membership in the WUA, 55% of the members reported receiving insufficient amounts of water. Some members attribute this to the downstream location of their fields, as one member in Kyzyl-bel describes: "We have a lot of land, but we have to wait a long time for the

water. Sometimes the water does not reach the end of our field.” But in addition to the location of their field, members most often attributed their lack of water to other farmers’ water use. The effect of field location and stealing is illustrated by this member in Byjum:

We pay them to give us water for four hours. But it takes two hours for the water to come to us. For two hours, you can have water. But then people can close the water gate so sometimes the water does not even get here.

As stealing water appears common among both members and ‘free-riders,’ farmers in the research areas expressed the need to guard your irrigation water. However, not all farmers are able to guard their water, as described by this member from Kyzyl-bel.

Sometimes when we go to our fields to irrigate, we open the water gate and when we leave someone comes and closes it. But then our land does not get water. But we cannot guard it all the time because we don’t live near our *ylsh*.

This creates a specific difficulty for women such as the member above who do not live near their *ylsh*, and for others who do not have the time to stand watch during the entire irrigation period. This may be especially difficult for female heads of households due to their many other household responsibilities.

For users who have not paid, when water is diverted from their field, they have not lost their money because they did not pay. For members, however, this creates a particular disadvantage because when their water is diverted, they lose the money they invested, their scheduled turn in the rotation, and the needed irrigation water. A similar problem can occur if there is a problem with infrastructure, as one member in Doctuk describes.

If you paid for two or four hours of water and at that time the pump breaks your turn is gone and your money is wasted. This creates a difficult problem with our water. If we get water for two hours and at that time the pipe is not working, you get no water at all. Then our vegetables wither.

This irregularity of water distribution caused by unregulated use or failing infrastructure can disproportionality harm the members who are regularly paying ISFs: when they do not receive their irrigation water, they lose water, their scheduled turn, and the money they invested.

Some members address this problem themselves by digging wells if they can afford it, or by stealing water themselves. For instance, some members irrigate out of turn in response to other farmers taking their water. A member from Kyzyl-bel described the need to steal water in order to maintain sufficient water access, saying, “You have to steal to get water, or else your crops will dry. If your water does not come, you have to take it.” Another respondent in Batken city whose husband is an active member said, “When we don’t get water we just open the water gate and leave it open to irrigate whenever the water comes. Then later someone else can close it to use the water in their field.” These examples illustrate that unregulated use is not only attributed to users; when members’ irrigation water does not come, often due to unregulated use upstream or infrastructure issues, they maintain access through stealing water and further unregulated irrigation.

WUA Leaders

In this study, two female respondents held leadership positions: one was a council member in Byjum’s WUA and the other was the WUA director in Batken city. The director is the first woman in the director position in the research area and the council member is currently the only woman in leadership in her WUA. The director had been elected just three months prior to the study and at the time of the study, was beginning the first growing season as director. She had, however, been involved in the WUA since its establishment in Batken city first as an accountant and then as an engineer. The council member had also been involved in the WUA since its establishment first as a member and then began serving on the council.

Both the director and council member appeared to be well connected in the community. For example, the director completed a bachelor's degree in Tajikistan and went on to work as chief technician in a processing plant during the Soviet Union followed by work as an accountant and engineer in the WUA. She holds a leadership position in a local branch of a political party and is the recipient of several awards from various social and political organizations. The WUA council member was also well established as a leader in her community. In addition to serving as a council member, she works as the director of the clean water association for her village. The council member did not attend a university, but she did graduate from a special secondary school where she received technical training.

Benefits to leadership

Both the council member and director benefit from a high involvement in decision making and management in irrigation. As farmers, these leaders spoke about how this involvement contributed to their water access, as the council member describes:

Because of my farm, I am an active leader in the WUA. When there is no water, my crops will not grow so I need to support the work of WUA. This is so they will give water on time. And when you get water on time, you will have a fertile harvest.

Specifically, this council member is responsible, along with the other council members, for electing the WUA director. Further, the WUA director is responsible for hiring accountants, engineers, as well as creating the irrigation schedule. Thus, they each have authority to make decisions in the WUA that will benefit themselves and the community.

Challenges to leadership

Both the director and council member invest a significant amount of time and energy into their leadership roles in the WUA as shown in the director's description of her work:

In the beginning there are major difficulties. Because I am new in the position I can't sleep at night because I always think about water problems. I want to serve the people. The only thing I wish is that the lives of the farmers will get better. My obligation is to get the water to them. The better people's lives become, the happier I will be.

The council member also described her difficulties in leading as a woman.

Basically my work is a man's work. It is very difficult for women. I play the roles of both a man and woman. Sometimes I forget that I am a woman. Maybe that is because of my freedom? There are times when I need to speak harshly. There are times when I want to give up on my work. But if I give up no one else will do my job. I have to continue.

In a largely patriarchal society, the council member acknowledged she was transcending traditional gender roles in her leadership, and at some points, wanted to quit. However, despite difficulties, both leaders communicated deep commitment to their roles and their communities, and while they were the only women in leadership in their WUAs, each leader attributed their motivation and commitment to their gender. For example, the director compared her work with that of men in the office and criticized habits she associated with men in her community.

I am the first woman [in my position]. Before there were only males in the office...Before when I worked as an accountant I saw how male leaders had a hard time and I thought I should work differently. Even when I relax at home I am always thinking about how I should implement my work...In comparison to men, we [women] try to complete our plans, we are honest in our hearts. We may be better leaders because we don't fight or drink alcohol or smoke cigarettes like men.

The council member held similar opinions about the differences between the work ethic of men and women leaders:

For example, if a man works in the government and receives a salary for 7 hours he will only work for 7 hours. For women, we will work even at night in order to give people water and our working hours are not counted.

These statements also highlight the amount of time these leaders invest into the WUA. Just as the members invest more time than the users, the director and council member spend more time and energy than the members in their work with the WUA.

Intersectional Influences on Participation in WUAs

Age

In this study, members were, on average, older than users, and the two leaders were older than the members. This trend is influenced by the tradition in Kyrgyzstan that elders are respected and honored within the home and community. For women in particular, this may be rooted in traditional Kyrgyz culture that dictates that a woman has fulfilled her duty after her reproductive period or after the birth of a certain number of sons. This grants her a certain amount of freedom and allows older women to act outside of gender norms associated with younger women (Ibraeva et al., 2011). Further, older members of a household usually delegate household tasks to younger members and therefore have more time to invest in WUA membership.

In Kyrgyzstan, traditional divisions of household labor leave young women with greater responsibilities within the home and therefore less time to attend meetings and fewer opportunities to communicate with WUA officials. For example, some respondents cited needing to stay home with their children as a reason for not attending WUA meetings, as one user in Batken city said, “My husband will go to the meetings, I need to stay home with my babies.” For young married women in particular, finding time for outside activities can be particularly difficult due to traditional expectations. These can include the expectation that they will begin to have children within the first year of marriage, and if married to the youngest son of a family, they are expected to care for their in-laws. Specifically, the role of young married women as an unpaid labor force who replaces the “worn out” mother-in-law is often seen as a normal and expected part of the family structure (Ibraeva et al., 2011, p. 29). In many cases, the bride is included as an equal member of the family, however, in others, especially in cases of bride-

kidnapping¹², marriage is seen as a strategy "to increase the labor potential" in the family (Ibraeva et al., 2011, p. 30). In these situations, young women may be given the majority of the household work while the older women in the family are relieved of these responsibilities. This is exacerbated in rural, lower class households with high labor needs. This creates a context in which the older generation has more time to invest outside the home in organizations such as the WUA while the younger women work at home.

This division of labor was also seen when conducted interviews in homes. The younger women in the household always served tea and snacks, whether it be daughters or daughters-in-law, while the older women talked. Additionally, farmers and officials alike confirmed this division of labor. The village leader in Byjum stated, "It would be good if women participate but they have to work, they have to look after the family." When asked why women do not participate, a user seemed to suggest a young woman's responsibility to her family: "It is difficult for women to work with the WUA because you would need to leave your family and monitor the water and you should be late for your irrigation time. So it is difficult especially for young women." It is this division of labor, cultural expectations, and traditions that influence the intersection between age and gender that excludes young women from participation in the WUA.

In contrast to young women, older women have more respect in the community that grants them the ability to participate in the WUA. One young user observed that if women were attending meetings, they were usually older women. Similarly, a member reported that she did not begin participating in the WUA until she was older and had more time. Age can also be used

¹² Bride kidnapping (ала качуу) is used to describe various situations ranging from a consensual elopement to a non-consensual kidnapping. Non-consensual bride kidnapping is officially a criminal offense and but is popularly accepted as a traditional practice. Research conducted from 1999 to 2004 estimates that the number of ethnic Kyrgyz women married against their will as a result of bride kidnapping increased from 33% in 1999 to 45% in 2004 (Ibraeva et al, 2011).

to negotiate with other farmers and the *myrab* when there is high competition for water, as one member in Leilek reported:

If you want to sign up for your turn to get water the canal area is filled with cars and about 200 people go to get water. I tell people that I am an old *eje*¹³ and need water. I tell my *myrab*, “Please let me get water, I am an old *eje*.”

In contrast to the younger users, these *ejes*' age allows them to act outside of the traditional segregation by gender. They are able to interact with both men and women and will often take an authoritative role in social situations. This respect was also observed during the interview process, especially in the time spent with the two leaders who were among the oldest of the respondents. For example, on one occasion after looking for a place to sit for an interview with the council member, she knocked on the door of a closed restaurant and forcefully told them to open their doors so she could sit down. Their compliance may be due to both her age and position in the community, but they quickly opened the door and offered her a chair. Additionally, in observing the director working with her younger male staff members she led with confidence and the staff appeared to respect her decisions.

Class

This study showed that class, as indicated by size of land owned, land tenure, and the ability to afford ISFs, influenced participation in the WUA. Land tenure is defined here as the legal ownership of land, and the legal right to rent or own land. The affordability of the ISFs is based on respondents' self-identification of the ability to pay ISFs.

First, it was confirmed by both farmers and officials that those who owned more land are more likely to participate in the WUA. This is reflected by the demographic data collected in this

¹³ Literally translated as older sister or aunt, this term is used in reference to any woman older than the speaker.

study showing that leaders owned the most land, followed by members, with users owning the least amount of land on average. Second, farmers who are unable to afford the ISFs required for participation in the WUA are likely to irrigate as users. While it can be argued that the ISFs are a minimal fee, users still spoke of the difficulty of affording ISFs. For one user, ISFs were an unaffordable expense due to medical issues: “For me, it is too expensive because I have financial difficulties. My daughter is disabled. Every month she should get treatment...the money we receive from disability is not enough. We can’t even eat well.” Others spoke of unemployment and the rising cost of ISFs as reasons they could not afford to pay the ISFs and consequently avoided membership in WUAs to evade paying the ISFs.

In addition to the difficulty of affording the established ISFs, both farmers and officials spoke of the problem of corruption in the WUA, making it more difficult for those with fewer finances to pay the unwarranted ISFs. One user in Byjum described her inability to afford ‘extra’ fees or contribute labor:

I talked to the myrabs [about not having enough water] but I can’t pay extra. So he shouts at me to clean the canals. But I am not capable of cleaning the canals because I need to feed my children and take care of my house.

For this farmer, she could not pay extra ISFs to ensure sufficient water access, so instead she chose to irrigate as a user to maintain her water access independently. Conversely, multiple respondents claimed that if a farmer can pay extra, they could get water without waiting for their scheduled time and without contributing labor to the WUA. This may motivate those who can afford to pay extra ISFs to irrigate as members so that they can benefit from this preferential treatment.

Officials knew this corruption was a problem, as the WUA accountant in Batken city admitted, “People are ‘eating money’¹⁴ in the WUA. But if you work according to the law, if you work honestly, then there is no place for corruption. We should make attempts to reach that level.” A farmer in Batken city specifically criticized the work of the auditor, who should work against corruption: “[The auditor] doesn’t work legally. The most important thing is transparency. You should not “eat” extra. Then the work will go smoothly.” For farmers with financial resources, paying extra in order to ensure water access may be possible, but for farmers with fewer resources, the need to pay more than the established ISFs may influence their decision to avoid working with the *myrabs* and instead secure water as a user.

Land tenure

In the context of this study, land tenure is influenced by both gender and ethnicity. After independence, land was privatized and allocated to Kyrgyz citizens, including women, and according to the 1999 Land Code, Kyrgyz citizens are entitled to land free of charge for individual housing construction and agricultural production (Country profiles on the housing sector: Kyrgyzstan, 2010). Therefore, all of the Kyrgyz citizens in this study have the legal right to land ownership and many had received *yllysh* after the collapse of the Soviet Union. However, in practice, women’s land ownership is hindered by gendered norms at the family and community level.

It is expected upon marriage that the wife will leave her family and move to her husband’s home. If she has *yllysh*, it is usually assumed that it will become a part of her father’s land and she will not be given the option to sell or lease it as a source of income (Ibraeva et al.,

¹⁴ In Kyrgyz, the phrase “eating money” is used to describe bribery or corruption.

2011). When one respondent was asked about land ownership, she stated “My father-in-law [owns this land]. This is our system. In my family, my family owns the land. This division does not include women so my own *ylysh* is at my birth place with my family.” As WUA membership is usually in the name of the landowners and because women are often living and working on land owned by their husband’s family, they are rarely documented as members in the WUA. Further, in the event that their husband dies and they want to become members of the WUA, according to the Water Law, the widow must first pay off any ISFs debts acquired by her husband before she is able to become a member (Water Law, 2002). In order to avoid this payment, these women may choose to irrigate as a user.

Due to the research area’s proximity to the Tajikistan border, the area was a common place for ethnic Kyrgyz to live after moving from Tajikistan. Many Kyrgyz moved to Tajikistan during the Soviet Union, and now many are choosing to return. However, because they were not living in the Kyrgyzstan during independence, they did not receive Kyrgyz citizenship nor did they receive *ylysh* during land redistribution. Further, they cannot rent land until they are legal citizens of Kyrgyzstan. This can be a time consuming process; one respondent reported that her family had lived in Kyrgyzstan for two years and were still waiting for their passports. Once they do have their passports, they must wait for land to become available, as one WUA member in Kyzyl-bel recalls:

I do not have *ylysh* because when we moved from Tajikistan we were too late [after land redistribution]. I was unable to rent land at first, but finally there was land available and they allowed me to use it. Every other land was occupied.

According to the WUA law, renters such as this family are able to participate in the WUA if they have the legal the right to use the land. However, according to the Water Law, they cannot join the WUA if the rented land has unpaid ISFs as any renter is responsible for the payment of

outstanding ISFs whether through obtaining the payments from the previous owners or paying the ISFs themselves (Water Law, 2002). For renters using land associated with ISFs debts, this policy can be a barrier to membership in the WUA as they may choose to irrigate as a user to avoid paying the outstanding ISFs.

Geographical location

In this study, the nine female members of the WUA were concentrated in two of the five research areas. Specifically, five respondents from Doctuk and four respondents from Kyzyl-bel identified as WUA members while there were no members interviewed in Byjum, Batken city, or Kadamjai city. This trend, of course, could have been due to the sampling method; there may indeed be members in all areas but they were not interviewed. However, responses in the interviews suggest differences in participation between the areas. Causes of these differences are difficult to measure, but this study suggests that differences may be influenced by access to water and rates of labor migration.

Labor migration

Data on labor migration by research area is difficult to locate but data on the absent population by district reveals that Leilek district, where Doctuk is located, has the highest percentage of absent residents in the oblast. Specifically, 18% of their rural population is absent in comparison to 11% in Batken district and 8% in Kadamjai district (Population and Housing Census of the Kyrgyz Republic, 2009). Further, as stated above, the majority of labor migrants from Batken oblast are male (Osmonaliev, 2009). Therefore, this higher percentage of absent residents may contribute to more female headed households and their participation in WUAs. As one member in Doctuk reflected, “I see many *ejes* without husbands who are participating.”

When asked who attends WUA meetings, another member responded: “We do. Our husbands are in Russia...so women are involved in decision making.” This is in contrast to the reports of low participation in other areas. For example, in Batken city, the accountant reported, “In the city, the only one who works with the WUA is the director. I have never seen any other women participate in WUA” and in Kyzyl-bel, when asked about who attends the meetings, one of the four members interviewed responded that, “I can’t tell, but mostly men. Women rarely participate. Only me.” Therefore, a larger absent population in Doctuk leading to more female headed households may contribute to women’s participation as they step in as irrigators and members of WUAs.

Water access

This study suggests that differences in water access may also contribute to women’s choice to participate in WUAs. Specifically, this data suggests that women may choose to participate in places where water access is stressed. For instance, in Doctuk, irrigation water is pumped from Tajikistan¹⁵, and farmers report frequent disruptions of water due to failing infrastructure. When asked about water access, one farmer in Doctuk spoke of the impacts of the water shortages:

We have plenty of difficulties here. Our canal starts in Tajikistan and sometimes the pump stops working. When that happens, especially during hot days, if the vegetables don’t get irrigated the small crops like tomatoes and cucumbers wither.

Another farmer in Doctuk reported that when the pump breaks during periods of high water demand, the water shortage also causes conflicts in in the community.

¹⁵ The Kayrakkum reservoir is located on the Syr Darya river and stores up to 4.2 trillion m³ of water. This research area relies on the water lifted from this reservoir by an electric pump station (Pak et al., 2014).

Last year when the pipe broke there were long lines [for water] and many fights broke out. In spring, water becomes a major source of conflict. Sometimes you wait for your turn to irrigate and the water will not come. Then you have to try again.

This water insecurity motivates some farmers to participate in the WUA, as one farmer in Doctuk said, “We must participate...After the meetings, they may fix the pipes and provide water access. We must participate in the meetings.” Conversely, in places like Kadamjai¹⁶, farmers report improved water security and community management of water infrastructure.

The water situation is good here. We are near the river and there are many canals for irrigating. We keep the canals clean. If we don't clean it, there will be less water. People usually understand that we should take care of canals, that we should control our water use and pay attention to the condition of the canals. Our goal is to minimize our water use and save more. If it is an old canal we should repair and clean it, or build a new one to save water.

This water access may dissuade some farmers from participating as they no longer benefit from participating in the WUA. For example, one user in Kadamjai stated, “Before we didn't have a lot of water available but by being a WUA member I would get water to my land...Basically it was a problem of not enough water. But now it is better.” This farmer no longer participates in the WUA and is able to irrigate her land without membership in the WUA. Similarly, in Batken city¹⁷, sufficient water access may also promote irrigating as a user, as reported by this user who, when asked if she participated in the WUA, responded, “No. We don't need to [participate] because we have plenty of water.” As the WUA director said, “In Batken city the water problems are less because we have the Tortgul reservoir,” and according to a farmer in Batken, “The irrigation water is good here. It comes from Tortgul and is better than other places. If you want to

¹⁶ The Aksu river is a tributary of the Syr Darya river. Before flowing through Kadamjai it passes through an Uzbek enclave, through Kadamjai, and into Tajikistan (Pak et al., 2014).

¹⁷ Batken city, Byjum, and Kyzyl-bel receive water from the Tortgul reservoir. This reservoir is located on the Isfara river, stores up to 90 million m³ of water and supplies 9,000 ha of land with irrigation water. It is located within Kyrgyzstan borders but Tajikistan and Kyrgyzstan have an agreement that allows Tajikistan to draw 8 million m³ of water from the reservoir in March and April (Pak et al, 2014).

farm, the water here is sufficient, there is no dry land.” For the farmers who experience sufficient water access due to their geographical location, they may choose not to participate because they can irrigate without membership in the WUA. Conversely, for those farmers whose water supply is more variable in places like Doctuk, they may choose to participate in the WUA in order to work towards increased water security.

Conclusion

This study reveals that while cultural gender norms support assumptions that women do not irrigate, women often take part in irrigation labor, especially if their husband or other male family member is absent or unable to irrigate. However, despite their role in agriculture and irrigation, this study showed that WUA membership and leadership among women in the area is low in part due to gendered exclusions, choice, and low access to information. This is due not to gender alone, but also by the intersecting influences of age, class, and geographical location. These intersections shape their participation as leaders, members, or users. This study also demonstrates that it cannot be assumed that leadership or membership in the WUA leads to the greatest benefits for the farmers; rather, each participation type holds distinct benefits and challenges for the farmers. Thus, while exclusions and limited access to information create barriers to the WUA, women can be strategic in how they choose to participate.

CHAPTER 5

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

In order to add to the understanding of gendered participation in natural resource management, this study examined both the roles and functions of WUAs as well as women's participation in WUAs in five services areas throughout Batken oblast. First, a review of literature and findings from interviews with WUA officials, village leaders, and farmers established the functions of the WUAs in the research areas to show the ways in which the historical, regional and local contexts of the study areas influence the WUA. Second, this study drew on these interviews to examine the gendered division of irrigation labor and women's participation as users, members, and leaders in WUAs.

This chapter will first discuss ways in which the WUAs can increase benefits of membership in order to increase participation. Second, it will examine the need for the WUAs to decrease barriers to participation by expanding the inclusion of users in the WUAs. Following this discussion on recommendations for WUAs, this chapter will present this study's implications on gender and participation theories. Finally, this chapter will discuss directions for future research to explore and promote equitable, efficient, and empowering irrigation management.

Increasing Benefits and WUA Participation

This study revealed that while some women do not participate in WUAs due to exclusions, others strategically choose not to participate because they see little benefit to membership. Others do not participate because they have limited access to information about the WUA. In order to encourage an increase in membership, the WUA needs to address the ways in

which low efficiency and equity in WUA processes dissuade farmers from participating. Specifically, the WUA can improve the consistency and accountability in ISF collection, rehabilitate and maintain irrigation infrastructure, and increase access to relevant and understandable information. In addition to promoting membership, addressing these issues will improve the functions of WUAs and thus establish WUAs as an efficient and sustainable method of irrigation management in Kyrgyzstan. These improvements will oppose the transition to privatization of irrigation water that has been shown to increase efficiency but exacerbate inequalities and disempower water users. In contrast, WUAs have the potential to provide equitable, empowering and efficient water management if they address the following issues.

Consistency and accountability in ISF collection

This study illustrated that for some farmers, their low willingness to pay ISFs may be due to the unaffordability of the payments. For others, however, they may choose not to pay because they are able to secure irrigation water without paying ISFs. Therefore, they see little or no benefit from paying ISFs and instead irrigate through cooperation with their neighbors or, conversely, through irrigating at night when there is little monitoring of the water. Still others are dissuaded from paying due to extra charges demanded by the WUA officials. In order to increase consistency and accountability in ISF collection, the WUA will need to address each of these issues: affordability and consistency of ISFs, corruption, and free riders.

Affordability and consistency of ISFs

In order to address the affordability of irrigation water and exclusions based on class, WUAs should first ensure that a diversity of voices are included when setting ISF amounts in WUA meetings. Members' rights to approve ISFs amounts are clearly stated in the 2002 Water

Law, but based on the findings in this study, farmers may be excluded from participation based on class. Consequently, ISFs are set based on the feedback from farmers with greater access to resources. This allows ISFs to be set at a higher amount than the unrepresented farmers can afford. In order to set ISFs that are affordable, the WUA must ensure that there is a diverse representation of classes when setting the ISFs. Another barrier to the affordability of membership in the WUA is found in the policy that requires farmers who are renting land or taking over ownership to pay any outstanding debts associated with their land to the WUA. While not every piece of land will have unpaid ISFs, the requirement to pay outstanding debts is a barrier to participation in the WUA. Therefore, this policy should be revisited to assess whether it is necessary.

In addition to the unaffordability of ISFs, this study revealed that the methods of collecting ISF varied and pose a barrier to farmers' ability or willingness to pay. Some ISFs were based on a seasonal contract between the farmer and the WUA. In this case, farmers were able to pay a percentage of the ISFs before the growing season and the remaining after harvest. In Doctuk, ISFs were calculated by the hour and paid at the time of irrigation. In each area, the frequency of stealing and infrastructure deterioration caused the amount of irrigation water received per *som* to vary greatly. In order to address the low collection rate among farmers, the WUA should create a uniform collection method based on volume of water so that farmers can expect to receive a specific amount regardless of disruptions or decreases in flow due to infrastructure issues or farmers stealing water. If WUAs can guarantee that farmers will receive the amount of water they purchased, farmers may be more willing to invest money into the WUA.

Finally, this study suggests that there are inconsistencies between farmers' understanding of ISFs and the intended purpose of the payment. According to the 2002 Water Law and the officials in the study areas, ISFs are not payment for the water. Rather, ISFs are intended to pay for WUA services and maintenance of the infrastructure. While this was communicated by the officials, the farmers thought they were paying for water. Increasing the consistency in understanding of the purpose of ISFs could serve to increase farmers' ownership of the WUA and promote their willingness to pay if they support the ways in which ISFs are used.

Corruption and "eating money" in the WUA

According to the literature review and reports from both farmers and officials, corruption was present in the research areas. Specifically, it was reported that WUA officials in the research areas "eat money" by taking bribes for water. In order to promote equity in the WUA, the prevalence of bribery in the process of ISF collection needs to be addressed. This will ensure that farmers are receiving the amount of water they have paid for and eliminate the privilege of those who are able to pay bribes, thus increasing equity in distribution. Eliminating corruption could be encouraged through staff like the chief accountant in Batken who does not hesitate to speak out against bribery. Additionally, improving the auditing process and training staff in financial accountability may promote the transparency needed to decrease bribery while increasing farmers' trust in the WUA.

In the process to decrease corruption, WUA officials' salaries, should also be examined. Are they collecting bribes in order to make a livable wage? If their salary is not sufficient to provide for their needs, trainings on financial accountability do not address the full issue of bribery. Therefore, the WUA and the *RayVodKhoz* should examine staff salaries to see if low wage is contributing to the corruption.

Free-riders and stealing water

Literature on participatory processes and community based natural resource management often argue that water access through institutional structures such as a WUA improves water security for irrigators (Meinzen-Dick & Zwarteveen, 1998). However, due to unregulated use of irrigation water, members do not have better access to water than non-members in this study. Both members and paying users are often denied water access because of farmers who irrigate out of turn and users were frequently able to secure water access as free riders. Consequently, these users have little motivation to join the WUA. However, it does not appear only to be the users irrigating out of turn, members too reported stealing water, especially in the event that they had been denied their allotted amount. For example, if members did not get the irrigation water they paid for, they may irrigate out of turn to compensate. In that way, unregulated use is somewhat of a self-perpetuating cycle: one farmers' unregulated use may lead to another's to compensate.

For these reasons, it is important that the WUAs increase their supervision of irrigation in order to decrease free-riding and unregulated use of both members and users. This will require the WUA to increase monitoring, regulate payments, increase staff numbers to monitor irrigation, or invest in water measuring equipment. It may also require the WUA staff to enforce sanctions on free riders. Currently, the only sanction in place for “illegal water abstraction or repeated failure to comply with water distribution schedules” is termination of WUA membership (Water Law, 2002, p. 6). This sanction may motivate WUA members to irrigate on schedule. But for free riders who are not WUA members nor desire membership, this sanction does not apply to them nor motivate them to follow regulations. Therefore, the WUA, in

coordination with the community, should create and enforce appropriate sanctions in order to discourage free riding and noncompliance with the irrigation schedule.

Rehabilitating and maintaining irrigation infrastructure

Officials and farmers in each research area reported irrigation inefficiencies caused by deteriorating canals. Additionally, as it is estimated that there is a distribution efficiency of 55% for irrigation water in the country due to seepage and leakage, rehabilitation is vital to the increased efficiency of irrigation in the country (FAO, 2016). Therefore, in order to increase the benefits of participation, WUAs need to take an active role in the rehabilitation and maintenance of the irrigation infrastructure. This rehabilitation and maintenance of the irrigation system is vital to the WUA's ability to efficiently distribute irrigation water. Environmentally, this is necessary to protect soil quality and preserve water resources. It will also increase water availability to downstream countries as it decreases water loss. Finally, on a local level, if the WUA takes an active role in this rehabilitation, this may serve to promote participation in the WUA and payment of ISFs as farmers see benefits from the work of the WUA in their community.

Of course, financial stress is not felt only by the farmers; the WUA and the *RayVodKhoz* are also impacted by limited funds available for rehabilitation of the irrigation system. One way to address this gap is to raise the cost of ISFs thereby having the farmers themselves cover more of the cost of the system. While this study reveals that this raise may be unaffordable to some, there is indication that farmers are willing to pay increased ISFs if it will contribute to the rehabilitation of the infrastructure (ADB, 2013). Unquestionably, farmers cannot cover the enormous costs associated with rehabilitating the infrastructure; however, raising ISFs in addition to partnership with development agencies could be a method to address some of the

inefficiencies of their irrigation system. For instance, the WUA in Kadamjai appeared to be successful in increasing ISFs to collaborate with the World Bank in rehabilitation projects.

Because WUAs have struggled to efficiently manage irrigation water and rehabilitate the infrastructure, it may be suggested that Kyrgyzstan privatize irrigation water. While irrigation projects have been difficult to fund commercially because of the large amount of uncertainty in financial return, there have been examples private-public partnerships in irrigation systems in Peru, Egypt, and Brazil (PPPs in Irrigation, 2016). However, privatization of irrigation water could diminish equity in irrigation, as some farmers, especially smallholders, will be unable to afford to purchase water at market value. Further, privatization would eliminate the opportunity for empowerment in water management as community participation is removed. Therefore, it becomes important for WUAs to improve their efficiency in order to establish themselves as an organizational structure able to promote empowering, equitable, and efficient management.

Increasing access to relevant and understandable information

In order to increase the equity and efficiency of the WUA, all users of irrigation water should have the choice to be a WUA member if they desire. Therefore, the WUAs should ensure that all farmers have access to relevant and understandable information about the existence and functions of the WUA. However, this research indicates that there is a need to increase access to information regarding WUA regulations and functions, which will in turn increase farmers' knowledge of the roles and regulations of the WUA and give them the choice of membership.

Article 4 of the 2002 Water Law supports this access to information, stating that the activities of the WUA include “guaranteeing free access to information for WUA members about its activity” (Water Law, 2002). However, in order to promote inclusive participation, this access

to information needs to expand outside of members; users also need access to information in order to learn about the option of membership and irrigation regulations that apply to them as users. Further, it should be made clear that this is not the responsibility of the farmer; rather the WUA should make relevant information accessible to the farmers.

In this distribution of information, the form and channel of outreach is significant as it influences who has access to the information. This study showed that outreach varied in the research areas: the director in Batken city had recently published an article in the newspaper and recorded a television broadcast; the directors in Byjum and Kadamjai had pamphlets in the offices about the WUA, and Doctuk and Kyzyl-bel seemed to rely on word of mouth for outreach. These varied modes of outreach created gaps in information access in the communities. For example, if a farmer does not read the paper in Batken city or know where the WUA office is in Byjum, they may miss the information. Therefore, WUA staff should assess the most appropriate modes of outreach that will reach a wide range of farmers. These modes of outreach could include home visits, follow up through cell phones, and written material.

In order to reach women and young women in particular with information about the WUA, officials should explore conducting home visits in their communities, as was suggested by the director in Batken city. Findings reveal that young women are often home due to the gendered division of labor so meeting them there may be key to increasing their access to information. In this outreach, the WUA officials can explain the purpose of the WUA, describe membership, define irrigation regulations and rights, and convey any information about upcoming meetings. It should be noted, however, that in order to reach women in home visits, the WUA should employ female staff. As social settings are often segregated by gender,

employing female staff will enable the women in the household to interact comfortably and safely with the staff.

In the research areas, nearly every farmer and WUA staff had a cell phone and used it regularly. Therefore, the prevalence of this technology can be utilized to increase access to information for farmers. The *myrabs* and members already regularly use cell phones to communicate about irrigation schedules, but this technology can also be used in outreach. For example, during a home visit, farmers can have the option to give their phone number to the WUA. The WUA can then send text messages or make phone calls to remind farmers of upcoming meetings or events. While this form of outreach cannot stand alone, in cooperation with other outreach it could serve as a helpful addition to increase access to information.

In addition to home visits and cell phone communication, the WUAs can also make written material (pamphlets, brochures etc.) available in high traffic areas such as an area near the village bazaar. Literacy rates are high in Kyrgyzstan: 99% of the adult female population is literate (World Bank, 2016). Indeed, all of the respondents in this study completed primary school. Due to this high literacy rate, written material may be an effective way to communicate about WUAs. However, it must be located in an accessible area. In this study, the WUA in Byjum had pamphlets in the office, but the office was often locked. Further, the information must be understandable to the readers. For these study areas in particular, the information should be in Kyrgyz rather than Russian in order to communicate in their first language. It is also important that this information be relevant to the farmers; standard information about national WUAs may not be sufficient. Instead, written information should be specific to their community and context in order to provide applicable information that can be transformed into farmers' knowledge and action.

By increasing access to relevant and understandable information, the WUAs will support the increase of farmers' knowledge that will allow them to make informed decisions about participation in the WUA and irrigation in their community. For the research areas, home visits, following up with cell phones, and making written material available will increase the accessibility of relevant and understandable information. Each WUA, however, should assess the context of their community to discover what is most beneficial to reach the farmers in their community.

Increasing Female Farmers' WUA Participation

Supporting female farmers' access to relevant and understandable information is a key step to increasing their ability to choose to participate in the WUA if they desire. With knowledge of not only the existence of the WUA but also its functions, farmers are equipped to make decisions about participation. Further, by increasing the benefits of the WUA through decreasing corruption, setting affordable ISFs, and improving infrastructure, the WUA can promote membership. However, in order to support women's participation, the WUA should include users in the WUA and remove barriers to women's participation.

Removing barriers to women's participation

To increase women's participation, the WUA should find innovative ways to increase the representation of women in leadership. Kyrgyzstan does have a precedent for requiring women in leadership positions: a 2006 policy mandates that women represent a minimum of 30% of personnel in government bodies and local self-governing authorities (Ibraeva, 2012). While this policy has met implementation challenges, it may serve to support an increase in female leadership in WUAs, which in turn could remove barriers to women's participation in WUAs.

First, women in leadership may have a better understanding of women's involvement in irrigation and therefore may be more likely to include them in the decision making processes. This study showed that the assumption that women do not irrigate is prevalent among WUA staff. Female staff, however, may be able to recognize women's role in irrigation labor. Conversely, due to the intersections of age, class, and geographical location, it cannot be assumed that a female leader will understand or address all the issues that female farmers have in irrigation. For example, an elderly upper class woman may not understand the needs of a young woman whose husband had migrated for work. However, they may be able to acknowledge some of the gendered exclusions facing female farmers.

Second, female farmers may also feel more comfortable interacting with female WUA staff. Reflective of the cultural separation by gender, this study showed that women may choose not to interact with male staff or engage in a male-dominated field. Thus, it may be beneficial to hire female *myrabs* as these are the staff who are in regular contact with the farmers. While male officials in the study area argued that women do not have the physical strength nor the management ability that is needed to work as a *myrab*, there are female *myrabs* in the northern oblasts, illustrating that women can indeed perform in this role. This could increase female farmers' willingness to interact with *myrabs* regarding issues such as payment of ISFs, conflict resolution, or problems with irrigation distribution and thus decrease their barriers to membership in the WUA.

Increasing the number of women in leadership in the WUA not only removes barriers for female farmers to work with the WUA, but could also serve to empower the women in other community activities by illustrating their ability to lead, participate, and contribute to community management. For example, the work of the first female director in Batken illustrates that,

contrary to cultural assumptions, women can and do understand irrigation management. Her work, and the work of others like the council member in this study, discredit the belief that women do not work in irrigation and thus could create opportunities for women to move into leadership roles in the WUA in the future. However, due to the intersectional nature of the participation, it cannot be assumed that women's presence in leadership equates to an inclusive WUA. Rather, to be truly inclusive, participation and leadership should span genders, ages, classes, and locations.

In addition to hiring female leaders, barriers based on gender and age could be addressed through trainings for village leaders and WUA staff that target the false assumptions that women, and particular young women, do not or should not participate in irrigation. Specifically, this data shows that while WUA and village officials recognize the changing demographics in their community, this acknowledgement of the predominately male labor migration has not yet transformed into action. For example, while the Byjum director stated that more women are managing farms, he did not connect that to the need to include women in the WUA. Instead, many still communicated that women cannot participate due to their lack of strength and knowledge. Therefore, educating staff on women's water use may increase their willingness to include women in participation.

Increasing users' inclusion

Literature on participatory process often stress that having all users involved in management promotes efficient and equitable management (Agarwal, 1997; Upadhyay, 2003; Zwarteveen & Neupane, 1996). However, participation in organizations such as WUAs requires time and energy, and in this study, some users knowingly and strategically chose not to be involved in the WUA. It does not appear necessary nor beneficial for all water users to be

members of the WUA to achieve efficiency and equity. Rather, efficiency and equity could be improved if all farmers adhere to WUA polices regardless of participation type. Further, membership is not necessarily empowering. Indeed, requiring membership could actually disempower farmers by dictating how they invest their time and energy. Therefore, the WUA should not require membership by all water users, rather, the WUA should give all water users the choice to participate and promote their adherence to regulations regardless of their participation type.

While all water users do not necessarily need to be members of the WUA, all water users do need to be given the choice to participate fully in the WUA. As stated above, this means that the WUA needs to ensure that all users, including women, have access to information about how to participate. Meeting times, locations, and agendas should be readily available and publicized. But membership is more than attendance; women should be included fully in the proceedings of the meetings, their voices should be heard and their opinions respected. However, some farmers have neither the time nor the interest in WUA membership and such farmers should not be required to attend meetings as members in order to have access to irrigation water. Especially for women who are *de facto* or *de jure* heads of households, taking the time to attend meetings may be difficult. Those who choose to irrigate as users should not be penalized nor forced into membership, rather they should be equipped with the information needed to irrigate as a user complying with WUA regulations.

In order to promote adherence to regulations, WUAs should include users in their records and schedules without requiring membership or attendance in the meetings. This will ensure that these users are included in ISFs payments and the irrigation schedule, thus promoting efficiency of the system. Currently, the Water Law dictates that users should be charged 1.5 times

members' ISFs rates. However, there seems to be no reason that users should be penalized for choosing to not be members of the WUA. Therefore, this policy should be revisited in order to support the affordability of ISFs and eliminate barriers to ISF payment. Finally, for those who are irrigating as users, while they forfeit their rights to participate in the decision making processes, should not be denied necessary information about irrigation. WUA staff need to ensure that all irrigators, users and members, have access to information about schedules, fees, staff changes, training activities, or other pertinent information.

Future Implications in Women's Participation

This study revealed that water variability and the frequency of labor migration influenced women's participation in WUAs. Specifically, where water security was low and labor migration high, women's participation was higher than in areas with lower rates of migration and higher water security. Due to climate change and globalization, these two factors could become more significant in the future, thus requiring WUA response to these transformations in order to facilitate participation and manage of irrigation water.

First, water availability in the Central Asian region could decrease due to shrinking glaciers and snowfields, the source of the region's irrigation water. Further, according to Intergovernmental Panel on Climate Change, Kyrgyzstan's winter precipitation is projected to increase while summer precipitation is expected to decrease, creating drier conditions during the growing season (GFDRR, 2011). For Kyrgyzstan, this means that water availability will become more variable, increasing the need for efficiency in distribution and use and requiring equitable participation to ensure all farmers have access to this resource. Efficient use is also necessary for the region, as demand from countries downstream from Kyrgyzstan will continue even as supply decreases. Therefore, the role of WUAs to efficiently distribute irrigation water and rehabilitate

infrastructure to promote conservation becomes even more important in the midst of increased water insecurity in the region. As variability will increase throughout the country and region, the need for WUAs to include women in decision may also increase. Specifically, if women and all farmers can no longer irrigate through unregulated use or cooperation with neighbors, WUAs will need to include female farmers in the WUA.

Second, this study showed that women often take on irrigation labor and management when they are head of the households due to the labor migration of their husbands, sons, or other male figures in the household. In this study, women's participation in the WUA was highest among the respondents where labor migration rates were also the highest. As globalization continues to support the movement of people and ideas, it is projected that this labor migration from Kyrgyzstan will continue and increase, especially to Russia, as long as Kyrgyzstan's unemployment and economic problems continue and Russia's economic success remains (Schmidt & Sagynbekova, 2008). Therefore, the WUA needs to acknowledge the changing demographics' influence on who irrigates and consequently who should be involved in the WUA.

Summary of Recommendations

This study suggests that in order to promote participation among all farmers, WUAs should increase benefits of participation for farmers and expand outreach to promote access to information. Further, WUAs can increase women's participation in the WUA by eliminating barriers to their participation and including users in the WUA structure. Table 6 summarizes these recommendations and designates the actors that may be responsible for the implementation of the changes.

Table 6: Summary of Recommendations	
Recommendations	Responsible Actors
Increase access to WUA information through outreach to farmers	WUA directors, <i>myrabs</i>
Hire female WUA staff	WUA director, council, WUA members, village leaders
Increase adherence to irrigation schedule	<i>Myrabs</i> , all farmers
Promote transparency in finances and decrease bribery	WUA staff, audit committee, farmers, village leaders, <i>RayVodKhoz</i>
Create uniform ISF collection rate by volume	WUA director, accountants, <i>RayVodKhoz</i>
Revisit ISF policies to decrease barriers for renters and new owners	<i>RayVodKhoz</i>
Increase inclusion of users into WUAs	WUA directors, <i>RayVodKhoz</i>
Explore possibilities for funding infrastructure rehabilitation	<i>RayVodKhoz</i>
Respond to and plan for changes in community demographics	WUA staff, members
Plan for changes in water availability	WUA staff, all farmers

Theoretical Implications

Gender and development

While gender has been discussed and assessed in development initiatives since the 1970s, this study supports the theories of intersectionality that acknowledge the interconnected nature of social categorizations. Rather than being influenced by gender alone, intersectionality calls for a more nuanced discussion of identity and the ways in which intersections influence power dynamics. Specifically, this study illustrated that participation in WUAs was influenced not only by gender, but also by farmers' class, age, and geographical location. For example, an elderly female farmer with more land may have less barriers to membership than a younger female farmer. Therefore, this study also supports the post-modernist view that women are not one homogenous group; it cannot be assumed that all women experience the same advantages or disadvantages. Consequently, it cannot be assumed that women's participation means that all

women are included; rather participatory processes seeking to promote inclusion and equity should address the complex intersections of identity.

Management and pricing of water

This study revealed a number of problems in the functioning of WUAs. While it may be argued that privatization would solve these issues, this research suggests that participatory processes can and should be used to promote the affordability of water. For when pricing is decided upon by the community rather than the market, it can be an effective method to support efficient resource use and necessary infrastructure maintenance. Further, in this study, pricing contributed to farmers' exclusion from the WUA and choice to irrigation as users. They would instead steal water which harmed users downstream and contributed to low fee collection rates. These inefficiencies point to the need for community engagement rather than the market in the pricing of water fees. For as water is a vital resource in an agricultural community, decisions such as fee amount and purpose must involve all water users, including women and farmers from all classes in order to ensure affordable and equitable access to water.

Community participation in natural resource management

As stated above, literature on participation in natural resource management often emphasize the benefits of the participation for all resource users in the management process, citing increased efficiency, empowerment, and equity. However, this research indicates that it is not the participation of all users that is necessary, but the choice of participation for all users and the adherence to regulations that is needed to promote empowerment, efficiency, and equity. Indeed, requiring membership takes the choice away from the farmer, serving to disempower rather than empower the individuals. This research shows that exclusions must be eradicated to allow all users the choice to participate. By including users in the WUA structure while allowing

them to choose not to participate, these farmers are empowered to decide how to use their time and energy. Rather than promoting participatory initiatives that require participation, this research supports inclusive initiatives that empower the users' choice to participate.

Limitations

There should be caution in extrapolation of this study's results due in part to the cultural and translation hindrances discussed above. Therefore, these results require local verification and further research. Specifically, it is likely that the findings were influenced by the positionality of the research team and myself. Our gender, age, ethnicity and nationality may have affected what was communicated by the respondents just as it influenced how we responded and interpreted the data.¹⁸

While the gatekeepers from TSPC were directed to recruit participations based on criteria that promoted diversity, there were exclusions based on the selection of the respondents. First, while Batken *oblast* is 15% Uzbek, none of the respondents identified as Uzbek. This could be due to the fact the data reflects the research areas that had proportionally less Uzbeks than other areas of the *oblast*, but it could have also been influenced by the identity of the gatekeepers: they were each ethnically Kyrgyz and could have, whether intentionally or unintentionally, excluded Uzbek respondents.

In addition to the limitations in who participated in the research, there are also the limitations associated with the time in which the research took place as it did limit our ability to attend WUA meetings that would have taken place in early spring. This would have been beneficial to observe the dynamics of the meetings and note who attended. However, due to the

¹⁸ For further discussion on positionality and the implications of cross-cultural research, see the methodology section of chapter 1.

schedules of hiring assistants and the logistical difficulty of traveling through the mountains in late winter and early spring, we were unable to arrive at the research sites until after the meetings had taken place.

Opportunities for Further Research

In order to continue to add to the knowledge of gendered participation in WUAs in Kyrgyzstan, there are opportunities for further research that expand on this study. These include methodological and theoretical aspects that would further examine dynamics of women's participation in WUAs.

Methodological

There are multiple methods that could be used in further research that would serve to expand the understanding of gender, participatory processes, and water management. First, this research could be expanded by comparing women's participation to men's participation in this area. This could serve to provide a broader understanding of participation in WUAs by assessing how male farmers' experience differs from that of female farmers. This could also provide further information on the intersectional exclusions of gender, age, class, and location found in this research by exploring these exclusions for male farmers.

This research could also be expanded by conducting a study on women's leadership and the impact it has on women's participation. In this study, the female director had been elected only three months prior to data collection. Therefore, it was difficult to know if her leadership would promote the participation of women in her community. However, it may be interesting to assess women's participation in this WUA in the future and compare it to those with male

directors to explore any connections between the presence of a female in leadership and participation of female farmers.

As our respondents did not include the diversity of ethnicity in the research area, it would be beneficial to assess participation of the Uzbek population and expand on the findings from the ethnic Kyrgyz from Tajikistan that were discussed in the research. This would add to the understanding of the intersections of ethnicity and gender in participatory natural resource management. In an area where local ethnic tensions intersect with water conflicts, it would be especially interesting to explore WUAs' roles in conflict resolution among users of different ethnicities.

Additionally, this study would benefit from observing the WUA meetings. This would promote an understanding of who attends, how and if they participate, and whose voices are considered in decision making. It would also contribute to the understanding of the leadership in WUAs by observing who facilitates the meetings and how they respond to the farmers in attendance. Finally, as a decrease in water sources within Kyrgyzstan is forecasted, tracking the changes in participation, conflict resolution, and water distribution efficiency would provide understanding as to how communities adapt to an increase in water variability. This may be especially interesting in the border towns such as Doctuk in order to explore how transboundary cooperation is influenced by the changes in water availability.

Theoretical

Continuing to explore these aspects of water distribution and participation in irrigation management will add to the understanding of gendered participation in natural resource management. This study confirmed that participatory processes such as WUAs cannot be

assumed to be inclusive; rather they are subject to the intersectional exclusions dictated by community dynamics. However, in contrast to privatization, they may be vital to promoting equitable and empowering management. Therefore, participatory processes should continue to be assessed to identify exclusions and promote inclusive processes. Further, this study indicated that it may not be necessary nor beneficial to include all users in the WUAs. This claim can be continued to be assessed both in WUAs and in other participatory processes in natural resource management.

Conclusion

This study revealed several challenges to women's participation in water management in Batken, Kyrgyzstan. The legacy of the Soviet Union's centralized policies has been shown to have influenced the initial top-down structure in WUAs and the now deteriorated irrigation infrastructure significantly hinders the efficiency of water distribution. Independence, too, has caused difficulties: cooperation in transboundary water management has been difficult for the Central Asian republics, and land redistribution often supported existing power structures rather than distributing land equally among the people. In the midst of these challenges, WUAs are tasked with the management of irrigation water on a local level where low financial viability and deteriorated infrastructure hinder efficiency and equity in water distribution. Finally, within WUAs, women's participation is influenced by limited access to information, choice, and gendered exclusions.

Is it possible, then, for these associations to be vehicles of empowerment among all water users, including women? Are WUAs able to promote efficiency and equity in irrigation water distribution? Despite challenges on national and local levels, there are reasons to believe that power dynamics can be transformed to support equity and that inefficiencies can be overcome;

indeed, this study revealed individuals who are working to that end. Though there are challenges, the director in Batken calls us to envision a future in which all farmers have access to the vital resource of irrigation water: “Can you imagine how many fields will blossom? Imagine how the orchards would bring income to the farmers... In the beginning there are major difficulties, but we will overcome them.” Whether it be the Batken city chief accountant speaking out against corruption, the Kyzyl-bel council member leading outside of gender norms, or Doctuk farmers solving conflicts with their *myrabs*; these individuals reveal that there is potential for WUAs to efficiently and equitably manage irrigation water. This management process, then, can provide opportunities for empowerment, ensuring that all users, regardless of their gender, class, age or location, have a voice in irrigation management.

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APPENDIX A: INTERVIEW GUIDES

Introduction and Informed Consent

My name is Becca Nixon and I am a graduate student from the US working with the Tian Shan Policy Center in Bishkek to gather information about participation in Water Users Associations. Your participation in this interview is entirely voluntary, you can skip any question that you don't wish to answer, and can end the interview at any time without penalty. No personal identification information will be accessible or released to anyone other than the researchers.

Do you consent to be interviewed?

Will you allow this interview to be recorded?

WUA Leader Questions

Name:

WUA:

1. WUA operations
 - a. What are the council leadership demographics and roles (gender, age)?
 - b. What is the meeting format?
 - c. How are decisions made?
2. WUA area
 - a. What is the population?
 - b. How much of the land is irrigated?
 - c. How many farm units?
 - d. What are the main crops?
3. Farmer Participation
 - a. How do you recruit farmer's participation?
 - b. How many farmers participate?
 - c. What are the participants' demographics?
 - d. What are the requirements and rules for participation?
 - e. What activities or trainings are offered?
 - f. How do the farmers contribute to decision making?
4. Women's Participation
 - a. How many women attend WUA meetings?
 - b. What are their roles?
 - c. How do they vocally participate in the meetings?
 - d. How do they contribute to decision making?
5. Government Support
 - a. How do you communicate with other levels of government?
 - b. What policy guidelines do you receive?
 - c. What kind of budgetary guidelines or support do you receive?
6. Major Successes
 - a. What are the benefits to participation?

- b. What conflicts have been resolved?
 - c. What infrastructure has been improved?
 - d. How has irrigation timing improved?
7. Major Challenges
- a. What are hindrances to participation?
 - b. What conflicts have occurred within WUA or with other WUAs?
 - c. What infrastructure problems have you encountered?
 - d. What problems with water availability have you encountered?

Closing

1. Is there anything else you would like to tell me?

Farmer Questions

Name

Location:

1. Individual and Household Characteristics
 - a. Age
 - b. Gender
 - c. Marital Status
 - d. Educational Attainment
 - e. Occupation
 - f. Household members working away from home
 - i. For how long?
 - ii. How often?
2. Agricultural activities and land
 - a. What crops do you grow?
 - b. Who works in the field? What do you they do?
 - c. What kind of irrigation do you use?
 - d. Who owns the land?
3. Irrigation
 - a. Do you use irrigation water?
 - b. Who does the irrigation labor on the farm?
 - c. How are decisions made?
 - d. What are the irrigation water use regulations in your community?
 - e. Who is responsible for irrigation water in your community?
 - f. What are your rights as a water user?
4. Irrigation Problems
 - a. What kinds of problems do you have with your irrigation infrastructure?
 - b. Have you had trouble with the timing of irrigation on your land?
 - c. Have you had trouble with the amount of water available?
 - d. How often do you have problems with your irrigation per growing season?

- e. To whom do you go to for help when there is a problem with irrigation?
5. WUA Participation
- a. Have you heard about the WUA?
 - b. Are you a member of the WUA?
 - c. What dues do you have to pay to the WUA?
 - d. Why do you participate in WUA/Why don't you participate in WUA?
 - e. Who is in leadership positions in the WUA?
 - f. How are decisions made in the WUA?
 - g. What do you think are the benefits of participating in the WUA?
 - h. Do you attend WUA's general meetings? Why/why not?
 - i. How do you find out about WUA meetings?
 - j. How do you participate in the meetings?
 - k. Do you participate in WUA council leadership, act as a deputy, work as a myrab, or lead in another capacity?
 - l. Do you/how do you pay ISFs?
6. Can you tell me about your family's income sources?
- a. What income do you receive from the farm?
 - b. What income do you receive from off farm labor?
 - c. Do you receive any income from family members out of town (in the capital, Kazakhstan, Russia, etc)?
 - d. What assets do you have (house, car, computer, tractor, 2nd home, other)?

Closing

- 1. Is there anything else you would like to tell me?

APPENDIX B: RESPONDENT DEMOGRAPHICS BY RESEARCH AREA

Respondent Demographics by Research Area						
	Location ¹⁹	WUA Leaders	WUA Members	Users	Non-Participants	All Respondents
Number of Respondents	BJ	0	0	12	1	13
	BK	1	0	2	2	5
	KJ	0	0	3	0	3
	KZ	1	4	12	2	19
	DC	0	5	6	0	11
de jure HH	BJ	0	0	1	0	1
	BK	1	0	1	0	2
	KJ	0	0	1	0	1
	KZ	0	1	2	0	3
	DC	0	0	3	0	3
de facto HH	BJ	0	0	1	0	1
	BK	0	0	0	0	0
	KJ	0	0	0	0	0
	KZ	0	0	1	0	1
	DC	0	1	1	0	2
Household Member	BJ	0	0	10	1	11
	BK	0	0	1	2	3
	KJ	0	0	2	0	2
	KZ	1	3	9	2	15
	DC	0	4	2	0	6
Average Age	BJ	n/a	n/a	49	16	46
	BK	57	n/a	45	74	45
	KJ	n/a	n/a	46	n/a	46
	KZ	58	52	45	30	45
	DC	n/a	52	45	n/a	49
Average Land Ownership	BJ	n/a	n/a	0.85	0.55	0.81
	BK	3	n/a	0.89	0.15	0.52
	KJ	n/a	n/a	0.87	n/a	0.9
	KZ	3.15	0.82	0.77	0.63	0.9
	DC	n/a	1.5	1.3	n/a	1.4

¹⁹ Location Key: BJ: Byjum; BK: Batken city; KJ: Kadamjai; KZ: Kyzyl-bel; DC: Doctuk

	Location	WUA Leaders	WUA Members	Users	Non-Participants	All Respondents
Average Number in Household	BJ	n/a	n/a	6.2	8	6.3
	BK	6	n/a	5.5	4	5
	KJ	n/a	n/a	8.6	n/a	8.6
	KZ	4	5.7	5	5	5.1
	LK	n/a	9	5.5	n/a	5.8

APPENDIX C: INSTITUTIONAL REVIEW BOARD APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 12/3/2015

To: Rebecca Nixon
219 S 5th Street #5
Ames, IA 50010

CC: Dr. Francis Owusu
156 College of Design
Dr. Richard Schultz
242 Science 2

From: Office for Responsible Research

Title: The Impact of Water Users Association Participation on Women's Capital in Central Asia

IRB ID: 15-612

Approval Date: 12/2/2015

Date for Continuing Review: 12/1/2017

Submission Type: New

Review Type: Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- **Use only the approved study materials** in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- **Retain signed informed consent documents for 3 years after the close of the study**, when documented consent is required.
- **Obtain IRB approval prior to implementing any changes** to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- **Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences** involving risks to subjects or others; and (2) **any other unanticipated problems involving risks** to subjects or others.
- **Stop all research activity if IRB approval lapses**, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- **Complete a new continuing review form** at least three to four weeks prior to the **date for continuing review** as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. **Approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **IRB approval in no way implies or guarantees that permission from these other entities will be granted.**

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1138 Pearson Hall, to officially close the project.

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.