

Université de Montréal

Institutions and “Collective Action” in a Transitional Country Context: Managing
Water Resources in the Syr Darya River Basin

par

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Summary

Following the collapse of the Soviet Union, the newly independent countries of Central Asia undertook reforms of their agrarian sectors with varying degrees of speed and depth. In general, the reforms consisted of changes in the nature of land tenure and in the decentralization of irrigation and drainage management.

Through these reforms, former state management institutions were abolished leaving an institutional vacuum that presented an opportunity for the development of local-level management institutions. However, the historical context of the region poses particular challenges that may impede users to capitalize on such opportunities.

Water User's Associations or the local administration manage irrigation and drainage systems at the local level. Water User Associations represent international donor-driven initiatives to introduce equitable, democratic and participative institutions for irrigation and drainage management. There are indications that those informal institutions and traditional modes of cooperation that survived the Soviet era are gaining importance.

This study maps out the various institutions, defined as "rules in use", that farmers employ to manage the irrigation and drainage system in the Ferghana Valley within the context of changing land and water rights. The key objectives of the study are (1) to understand the importance of irrigated water for local livelihoods in the research area; (2) to explore certain characteristics of the formal and informal institutions through which farmers manage irrigation and drainage systems; and (3) to depict ways in which "collective action" in irrigation water management can be strengthened.

The methodology consists of a synthesis of existing literature and fieldwork in the Ferghana Valley in Kyrgyzstan, from April 30 until 31 July, 2008. The results of the research are presented as a case study.

Sommaire

À la suite de l'effondrement de l'Union soviétique, les états nouvellement formés de l'Asie centrale ont entrepris, à différents niveaux, des réformes de leurs secteurs agraires. Du point de vue de l'utilisation de l'eau d'irrigation, les réformes consistent notamment en des changements aux régimes fonciers et dans la décentralisation de la gestion du système de drainage et d'irrigation.

La plupart des institutions qui, durant l'époque soviétique, géraient le système d'irrigation et de drainage ont été abolies. Cela a créé un vide institutionnel et permis le développement d'institutions au niveau local qui puissent être participatives et appartenir aux utilisateurs. Pourtant, le contexte historique et contemporain de la région pose des défis particuliers pouvant nuire à un tel développement.

Les associations d'utilisateurs d'eau ou le gouvernement local gèrent l'irrigation et les systèmes de drainage au niveau local. Ces associations représentent souvent des initiatives conduites par les donateurs internationaux. Parallèlement, les institutions informelles et les modes traditionnels de coopération qui ont survécu à l'ère soviétique deviennent importants et quelques institutions créées durant cette ère demeurent toujours pertinentes.

Cette recherche consiste à évaluer le rôle d'action collective dans un système de gestion d'irrigation et de drainage dans le bassin versant de la rivière Syr-Darya dans un contexte changeant concernant les droits d'usage de l'eau et de la terre. L'étude cherche à (1) saisir l'importance de l'eau d'irrigation dans les moyens de subsistance des utilisateurs dans la région de recherche; (2) explorer certaines caractéristiques des institutions formelles et informelles à travers lesquelles les fermiers dirigent des systèmes de drainage et d'irrigation; et (3) identifier les institutions qui appuient l'action collective et celles qui entravent son développement.

La méthodologie de recherche repose une revue bibliographique et sur un travail de terrain dans la vallée de Ferghana, au Kirghizistan, entre le 30 avril et le 31 juillet 2008. Les résultats de la recherche sont présentés comme une étude de cas.

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Glossary

<i>ail baschi</i>	Head of the village
<i>aksakal</i>	“white beard”, Elder
<i>arenda</i>	Land owned and rented out by the government
<i>aryk</i>	Field-level earth canal
<i>ashar</i>	Voluntary communal work
<i>kolkhoz</i>	Soviet-era collective farm, in which member farmers owned the means of production, but not the land
<i>murab</i>	Water master
<i>OblVodKhoz</i>	Province Basin Water Management Department
<i>ogorod</i>	Kitchen garden
<i>perestroika</i>	A policy or practice of restructuring or reforming a political and economic system
<i>RaiVodKhoz</i>	District Department of Water Services
<i>sotik</i>	Land measure (1 hectare is 100 sotiks)
<i>sovkhos</i>	Soviet-era agricultural enterprise owned and operated by the state
<i>subbotnik</i>	Forced collective labour
<i>ülüs</i>	Small landholdings that received for 99 years, due to the land redistribution

List of abbreviations

I&D	Irrigation and drainage
IMT	Irrigation management transfer
IWMR	Integrated water resource management
O&M	Operation and maintenance
PIM	Participatory irrigation management
UNEP	United Nations Environmental Programme
WUA	Water User Association
WUG	Water User Groups

Chapter 1 Introduction

Irrigation Management Transfer (“IMT”) is a broad concept that is used to define the process whereby the responsibility and authority for the on-farm management of irrigation schemes is transferred from government agencies to user organisation or private-sector entities. Since the concept was first popularized in the 1960s, more than 57 countries have implemented irrigation sector reforms of which IMT forms a part.

Kyrgyzstan is among those countries. Since it gained its independence from the Soviet Union in 1991, several far-reaching changes have occurred in the agricultural sector. Agriculture itself has changed from a revenue-generating sector to one of the survival strategies of each rural household. The agricultural units of the Soviet era, the *kolkhoz* and *sovkhos* have been abolished and comprehensive land redistribution took place, creating millions of small landowners. The same irrigation system that used to serve the *kolkhoz* and *sovkhos* of various sizes now delivers water to millions of small landholders. While, during the Soviet administration, cotton was the main crop, today farmers are free to decide what crops they grow. All these factors challenge irrigation water use and management.

In Kyrgyzstan, much like in other countries that implemented IMT, it is promoted and supported by donors as a way to open new frontiers for millions of new independent landholders to participate in the management of their own irrigation systems: an idea inspired by the images of long-enduring traditional self-governed irrigation systems. IMT also means that irrigation departments would no longer have to shoulder the costs associated with the operation and maintenance (“O&M”) of secondary and tertiary canal systems. Rather, farmers would pay those costs in the form of water fees.

It has been well established that the management of such common-pool resources as irrigation water requires collective action. However, developing institutions for collective action faces various challenges. Some of these challenges are particular to Central Asia,

including Kyrgyzstan. First, throughout the 20th century, Central Asia has mainly experienced centralized and hierarchically organized management of its water resources. Although collective work formed the basis of the Soviet-era *kolkhoz*, it was compulsory and therefore not comparable to the voluntary collective action that is required for successful IMT. Mearns (1996a) points to this dilemma when he writes that, in Central Asia, collective action is more often than not associated with the failed experience of collectivisation and compulsory collective work. Yet, members of newly-established Water Users Associations (“WUAs”) are expected to collaborate with each other and with government agencies to collectively manage system maintenance, ensure effective, fair and timely distribution of water between farms, collect payments and settle small disputes (The Law Library of Congress 2015).

An equally significant challenge is developing the managerial capacities of the Kyrgyz government to co-manage irrigation water with the WUAs. Functions and responsibilities are divided between government line departments, local government agencies and the users themselves grouped in WUAs. Sustainable management of the irrigation system depends as much on the user-agency relationship as it depends on the status of physical infrastructure. Currently, the government does not have the financial and institutional capacity to wholly manage or co-manage the irrigation schemes on its territory. It is unable to collect all irrigation fees and there tend to be deferred maintenance of the system due to a lack of funds. An added challenge for the agencies is to manage the politics around sharing irrigation water: while previously water was supplied via a regional canal network to an agricultural system that functioned as a whole, today borders divide the irrigation system, giving birth to shortages and countless disputes over surface water flows between the countries in the region and between cross-border communities.

These dilemmas that arise from the recent history of the region and from the far-reaching changes that have occurred since independence inspired the present inquiry into contemporary irrigation water management in the Ferghana Valley in Kyrgyzstan. This thesis explores, through a case study, collective action in institutions of local-level irrigation

management in the upper Syr Darya River basin. It sets out to provide an answer to the following research question:

What role does collective action play in the initiation and the practicing of local-level irrigation and drainage management institutions in the Ferghana Valley of Kyrgyzstan and how does it work?

Secondary research questions are:

What is the importance of irrigation water to livelihoods in the current context?

How did the local institutional context change during the transitional period?

What kind of water management institutions (formal and informal) do current land and water rights generate at the local scale?

The fieldwork took place in two communities in the Kyrgyz Ferghana Valley, in the upper Syr Darya River basin, over three months, in the Summer of 2008. The location of the research is described in greater detail in Chapter 3 under Section 3.2 and is shown on Figure 1.

The Kyrgyz Ferghana Valley was chosen as the location of the research due to its historic and contemporary importance as the breadbasket of Central Asia, and to the natural resource management issues that afflict the region due to the scarcity of arable land and to the density of the population. The Ferghana Valley has a semi-arid climate and agriculture and livelihoods are dominated by irrigation. Some 45% of the irrigation areas of the Syr Darya basin are located in the valley (UNEP 2005). There is a long history of irrigation and both the agrarian sector and irrigation has continued to undergo significant changes since independence and until today. At the time of the fieldwork, of the three countries located in the Ferghana Valley - Kyrgyzstan, Tajikistan and Uzbekistan - devolution was the most advanced in the Kyrgyz Ferghana. Here, the agricultural and land reforms designed to boost output and diversify agricultural production necessitated various new legal regimes and implementing institutions for accessing land and regulating water management at a local level (UNEP 2005). The restructuring of water management included handing over greater use and management responsibilities over the irrigation system to users organized into WUAs.

To answer the research questions, a desk review of the available literature has been carried out prior to the fieldwork. The data from the field was collected through interviews with farmers and officials and through participant observation over three months in the field during the irrigation season. The findings are presented in the framework of a case study.

The thesis is organized as follows:

Chapter 2 introduces IMT and defines the principle concepts in this research: rights, institutions and collective action. Based on the available academic literature, this chapter explores the linkages between these concepts. It then elaborates on the various forms that collective action can take in natural resource management, including its linkages with agricultural land- and irrigation water-use and livelihoods.

Chapter 3 describes the methodology of the research project from the design stage through the fieldwork to the analysis. A reflection on the various aspects of the fieldwork is undertaken and opportunities and limitations encountered during the research are elaborated upon. The research location is described in detail.

Chapter 4 describes how irrigation systems and their management in the Ferghana evolved during the Tsarist and Soviet periods. The discussion then moves on to explaining changes in the management of the irrigation and drainage system in Kyrgyzstan since its independence in 1991 until the present, and the impacts of that change on land and water rights and on institutions.

In **Chapter 5**, rural livelihoods and the ways in which rural livelihoods are impacted by post-independence transformations, specifically in irrigation water management, are explored. Based on the findings of the fieldwork, formal and informal organizations are introduced and their role and practices, including whether or not they inspire collective action is explained. The analysis is presented in the form of a case study of collective action among users whose lands are serviced by the WUAs.

Chapter 6 synthesizes issues brought up throughout the thesis. It returns to the research questions: the nature, characteristics, limits and possibilities of local governance institutions and organisations for managing irrigation water.

Chapter 2 Conceptual framework/Literature review

2.1 Transformations in natural resource governance and management

From the second part of the 20th century, governments, international organisations and NGOs have increasingly promoted the transfer of rights and responsibilities for the management of such common-pool resources, also called *the commons*, such as irrigation water, forestry, fisheries, wildlife and rangelands, to lower levels of government or directly to the users. Developed countries implemented many such policies from the 1950 to the 1970s, and developing countries followed suit in the 1980s and 1990's (Fujita *et al.* no date). In irrigation water management, devolution, also called IMT, reduced, and sometimes eliminated, the role of government institutions in operation and maintenance ("O&M), the collection of water duties, the distribution of water and conflict resolution, and delegated those roles to local-level organisations, such as water users' or irrigators' associations (Ghate *et al.* 2008).

Decentralization and devolution are but the latest in a series of shifts that have characterized water resources management throughout the world in general and in Central Asia in particular (Allan 2006). In Central Asia, as elsewhere in semi-arid regions, the pre-industrial era was characterized by decentralized and small-scale irrigated cultivation for subsistence. The shift to a "hydraulic mission", began in the 1930s with the collectivisation of lands and the development of large-scale irrigation systems by the Soviets in an attempt to turn the desert into a cotton-growing region. As a result of Gorbachev's policy of *perestroika* that made the development of civil society and a preoccupation with environmental issues (such as the drying up of the Aral Sea), possible, the hydraulic mission was replaced by a policy that was more concerned about environmental sustainability. The objective of development at this time was to improve economic performance and newly-independent governments began sectoral reforms, including land privatisation and the introduction of water duties. The latest step in the evolution of policies in irrigation

management is the promotion by international development agencies of Integrated Water Resource Management (“IWRM”), IMT and Participatory Irrigation Management (“PIM”) (Abdullaev *et al.* 2008).

Devolution and decentralisation policies, such as IMT and PIM, represent a great change from earlier policy that considered local communities obstacles to efficient resource management. That stand is perhaps best exemplified by the policies that were introduced as a result of Hardin’s “The Tragedy of the Commons”. In his article, Hardin explains how “ancient” ethics by which people traditionally showed restraint in using their natural resources are poorly suited for governing the commons in a “*complex, crowded, changeable world*” (1968: p. 25). He suggested that the users of the resource would deplete the resources in the absence of governance by a higher authority. His ideas greatly influenced the forms of ownership and governance of common resources from the time of his writing until very recently.

Just as the failure, in the past decades, of central management of the commons (Agrawal 1999; Meinzen-Dick and Knox 1999) to enforce management rules in rangeland and forest use and constantly changing irrigation flows has become obvious, it also become clear that Hardin’s theory is simplistic and too deterministic (Feeney *et al.* 1990). According to critics, Hardin, in his demonstration of the failure of common-pool resource management, did not take into consideration the capacity of users to regulate resource use through institutions of collective action and, in fact, he demonstrated the failure of open access resource use rather than that of the “commons” (Theesfeld 2004). Appell (1993) also argues that Hardin, in his work on the “commons”, did not take into account the “*emergent and self-regulating nature of social organizations*”. In fact, people are social beings and are capable of cooperation and solidarity. Another critique is that Hardin, in his theory, does not inquire into the existence of a social entity that hold rights to the resource, about the nature of that entity and the rights and powers it has over the resource. According to Appell (1993) “*the argument of Hardin’s critics, as well as the political philosophers interested in distributive justice, are faulty in one key aspect, which they share with Hardin. They fail to consider two basic problems: the locus of property rights, i.e., who are the*

holders of the rights, and who, on the system of property relations, are responsible for managing the rights” (p. 9).

In her work on common pool resources, Ostrom (1990) has also demonstrated that communities are able to design rules and institutions, and through, them manage resources sustainably. In her study of examples of common pool resource management by communities, Ostrom (1990) identified a number of conditions which are necessary for the sustained use and management of these resources by a community of users. According to her research, the most significant conditions are that the law regarding access and user rights and the mechanisms for conflict resolution must be local, clear, public, known to and accessible by all users.

At the same time, another paradigm that championed the role of user communities in resources management emerged. Supporters of communities as resource managers argue that users of a resource, given that they are empowered as a group to take over management of the resource, have the incentive to manage it more efficiently and sustainably than does the government. It is suggested that the capacity of a community or group of users to manage a resource in a sustainable manner is a consequence of its intimate knowledge of the resource. Additionally, the fact that members' livelihoods depend on the resource will provide a strong incentive to maintain the resource over time (Meinzen-Dick and Knox 1999). These ideas emerged from various scholarly studies of small-scale and long-enduring traditional irrigation systems, where users are able *“...to construct and enforce rules and norms that constrain the behaviour of individuals”* (Feeney *et al.* 1990: p. 63).

Based on the work by Ostrom (1990) and Baland and Platteau (1996), Agrawal (2001) has come up with and added to a comprehensive list of critical factors that ensure sustainable use of the common pool resources (Table 1). The six main categories are (i) resource characteristics; (ii) group characteristics; (iii) institutional arrangements; (iv) external environment; (v) relationship between resource and group characteristics and (vi) relationship between resource system and institutional arrangements. Each of these categories encompass a number of factors the presence or absence of which influence the

governance of the commons. Each of these factors may influence the success or failure of common pool resource management regimes. Mukherji *et al.* (2009) note that a large number of factors influence common-pool resource management and that these factors and the interaction between them may also impede the establishment of an overall theory on the successful management of common pool resources.

Table 1 Critical factors determining success of common property management regimes

<p>1. Resource system characteristics</p> <ul style="list-style-type: none"> (i) Small size (ii) Well defined boundaries (iii) Low levels of mobility (iv) Possibilities of storage of the benefits of the resource (v) Predictability
<p>2. Group characteristics</p> <ul style="list-style-type: none"> (i) Small size (ii) Clearly defined boundaries (iii) Shared norms (iv) Past successful experiences and social capital (v) Appropriate leadership (vi) Interdependence among members (vii) Heterogeneity of endowments, homogeneity of identities and interests (viii) Low levels of poverty
<p>3. Institutional arrangements</p> <ul style="list-style-type: none"> (i) Rule are simple and easy to understand (ii) Locally devised access and management rules (iii) Ease in rule enforcement (iv) Graduated sanctions (v) Availability of low cost adjudication (vi) Accountability of managers to the users
<p>4. External environment</p> <ul style="list-style-type: none"> (i) Technology: low cost exclusion technology and ease of adoption (ii) Low levels of interaction with outside markets and gradual change in interaction with outside markets (iii) State: governments not to undermine local authority, supportive external sanction mechanisms, appropriate external aid if needed and nested governance at different sociopolitical levels.
<p>5. Relationship between resource and group characteristics</p> <ul style="list-style-type: none"> (i) Overlap between resource domain and rights domain (ii) High dependence on the resource (iii) Perceived fairness in allocation of benefits (iv) Low levels of user demand (v) Gradual change in levels of demand
<p>6. Relationship between resource system and institutional arrangements</p> <ul style="list-style-type: none"> (i) Match extractible quantity with its regeneration capacity

Source: Adapted from Agrawal (2001):1659 and based on Ostrom (1990) and Baland and Platteau (1996).

2.2 A critique of irrigation management transfer

IMT came about as a result of the desire by governments and donors to make irrigated agriculture, an enormous user of freshwater resources, more efficient. Its appearance was based on a number of assumptions similar to those related to other common-pool resources. An analogy was drawn between communities that were to become managers of irrigation systems and users of traditional irrigation systems. Communities were thought of as cohesive, having a great inherent capacity for collective action that they would rally to create. They would implement and enforce collective rules that ensure organisational and environmental sustainability and efficient use. It was assumed that increased ownership and responsibility for the resource by users and increased involvement and decision-making powers for them would create a commitment to use the resource efficiently and sustainably. The fact that users themselves pay for the cost of O&M would increase that commitment. The principle that these objectives are based on is called the principle of subsidiarity, meaning that “*decisions are made the lowest level possible*” (Garces-Restrepo *et al.* 2007).

IMT is not without its critics. Hunt (1989) was one of the first to point out its faults by drawing an analogy between the capacity of users of modern irrigation systems to manage those systems with managers of traditional systems. He argues that traditional irrigation communities are “highly integrated systems” and that most WUAs, due to their differing organisational structures, may bear little resemblance to them in terms of land and water rights, bureaucratic structure and group membership (Hunt 1989).

Moreover, community cohesion cannot be taken for granted. The power relations between different groups of people in society is expressed in many ways, for example gender relations (what behaviour is acceptable for men and women), age (how the old and young are regarded and treated), class (how the social and economic status of different groups is generally understood) or caste (the various restrictions surrounding caste that influence what people of different caste groups can and cannot do to change their livelihoods) (Messer and Townsley 2003). The powers that are gained through the

decentralization process, which, in this case, are the rights to manage Irrigation & Drainage (“I&D”) systems through local institutions, are negotiated in a social environment that is crosscut by those “multiple axes of differentiation” (Agrawal and Gibson 1999). Differences in social status may create conflicting powers and values in the way in which people think about the management of resources, and these values will strongly influence users’ incentives and opportunities to participate effectively in decision-making (Cleaver and Franks 2005).

Questions regarding the supposed objectives and beneficiaries of IMT also arise. In the midst of the general enthusiasm for the democratisation (participatory management) aspects of IMT, few studies inquire into the politics behind management transfer. Suhardiman (2008) points out that the first IMT policy formulation originated from a desire by international donors and governments to reduce public spending on irrigation systems. With IMT, donors (who are frequently behind IMT/PIM), and governments, wished to achieve financial autonomy of irrigation systems through the recovery of operation and maintenance costs from users and by users’ organisations. Thus IMT was first and foremost an economic policy that aims at privatising public irrigation systems. It was only later, in the 1990s, and only then as an afterthought, that IMT policy was linked with ideas about democratisation and the decentralisation of management. Suhardiman (2008) concludes that the real motivation for IMT is difficult to assess: it is not clear whether the main role of the farmers’ organisation is to recover costs or to represent farmers’ needs.

As for the farmers, the actual “beneficiaries” of IMT, there is no evidence that they have a choice in whether or not to accept the responsibilities and the authority for the management of the system. In fact, it is frequently assumed that farmers are ready and willing to take over water management. After all, who would refuse such powers? However, the capacity to manage is rarely as simple as forming WUAs and handing over management responsibilities to them. After handover, farmer organisations must manage the physical, technical and social aspects of the system, tasks that require specialized knowledge. Users must develop certain capacities to manage complex irrigation systems because there is no evidence that they, just by being users, possess the same knowledge

about their system as users of small-scale traditional systems (Suhardiman 2008). A pointer to this potential lack of capacity is the fact that the modern irrigation systems of the 1960s and 1970s were designed without user participation and contribution.

The issue of user participation suggests that a concept that is commonly termed PIM should be considered. PIM is a process whereby users become participants in the management of O&M. PIM is frequently used to achieve IMT, especially at the co-management phase of IMT, when the management of the system is shared between the public sector agencies and some entity that represents the users (Garces-Restrepo *et al.* 2007). IMT and PIM are frequently used interchangeably resulting in unclear assumptions about the ultimate objectives of IMT.

The management organisation that is created during the IMT process and to which responsibilities for the management of irrigation system are transferred is, by its nature, a participative organisation. Users choose their representatives whose duty becomes to represent them. Representatives must also be accountable to the users. Participation is also accomplished in other ways, notably through communal work, and on a smaller scale, through taking turns and monitoring.

Regarding the participation of the farmer in the management of O&M, the view in this paper is taken that participation is necessary (for the reasons given above), but that various degrees of participation are possible. While in Mexico farmers are involved less directly in the management of irrigation and that task is contracted to private entities, in the Central Asian context, farmers are expected to contribute directly to irrigation management. In this context of Central Asia, participation through collective action is desirable because farmers are unable to pay high fees for contractors and are more likely to invest their own time and energy in monitoring and maintenance work. In this thesis the view is that farmer participation is not an end in itself but a way to improve the production of crops and agricultural incomes.

This section has provided an insight into the complexities of IMT and the various assumptions behind it. Next, the major concepts that are relevant to this research are explained.

2.3 The role of institutions, organisations and property rights in community-level resource management

At the heart of IMT is the capacity of farmer organisations to manage irrigation systems. At the heart of the management are institutions. Institutions, or rules in use, encompass the different levels of management in a resource management system, down to the farmers' level. They may be formal or informal. Leach *et al.* (1999), define institutions as *“regularized patterns of behavior that emerge from underlying structures or sets of “rules in use” communities or societies adopt to govern user behaviour and which are practiced over time”* (p. 237). Formal rules, such as those embodied by WUAs, have explicit organisational structures and a legal framework. Informal rules encompass the traditions, norms as well as groups and organisations that *“influence who has access to and control over what resources and arbitrate contested resource claims”* (p. 226). Formal or bureaucratic institutions exemplify how the system ought to work and partly determine the strategies that households employ to make use of the resources that are accessible to them. For example, policies for giving more responsibility to village-level institutions may give local people more influence over the decisions that affect them directly. Formal institutions are *“visible”* in the sense that they have formal and clearly defined rules, while informal ones tend to be *“opaque”* and therefore harder to recognize. Contrary to formal or *“visible”* institutions that are often imposed from outside, *“invisible”* or informal institutions tend to emerge from long-standing practices by members of societies and are embedded in a certain socio-cultural context. While formal institutions tend to be *“rigid”* structures, informal institutions are established and practiced in response to certain situations that the users face. They therefore, maybe constantly adapted to changing circumstances and the roles that people play in such institutions may also change from time to time (Messer and Townsley 2003). While formal organisations are often established to serve a sole purpose (for example the purpose of the WUAs is to manage irrigation water), informal institutions

are frequently a product of long-existing customs and practices in relation to various aspects of life, among which irrigation management is but one.

Organisations are strongly related to institutions. Leach *et al.* (1999) define organisations as “*groups of individuals bound together by some common purpose to achieve objectives*” (p. 237). Organisations exist because of a set of formal rules give them meaning. Institutions may or may not have organisational manifestations (Leach *et al.* 1999). When they do, these provide arenas within which people interact and therefore they are important elements of institution building. Such arenas may exist in the form of formal organisations (such as the WUA) and informal organisations (such as the Elders’ Council).

According to Vermillion (2001), Schlager and Ostrom (1992), Meinzen-Dick and Knox (1999) and Schlager (2005), a fundamental factor in the emergence of collective action is the existence of property rights. By property rights governments provide assurance to users that their access to the resource is guaranteed in the short term and into the future. Collective action and property rights are strongly linked: *de jure* and *de facto* property rights will influence the ways in which users assert claims to the resources by investing collectively into the protection of ownership rights (regulating access), operating the resource and organizing repair.

In terms of rights to irrigation water, Vermillion (2001) suggests that the following rights may be devolved to communities (fully, or in co-management with the government):

- water right - the right (of the WUA and individual users) to distribute the resource from the point of distribution to individual farmers;
- right to determine crop and the method of cultivation – the right to practice local knowledge;
- right to protect against land conversion;
- infrastructure use rights – the right to operate, repair, modify or eliminate structures.”

Other organisational rights consist of the rights of the association “*to mobilize and manage finances and other resources*”, including human resources, to accomplish certain works, to

determine “*its mission and scope of activities*” and impose rules and sanctions, to establish the right to membership of users in the organisation as well as excluding members, to contract outside parties for those works related to operation and maintenance that the association is not willing or cannot undertake and to access support services (Vermillion 2001).

Rights that users can receive (or create, depending on the level of privatization) can vary from only access rights (for example entering a national park) to full-scale ownership rights, which include all of the rights mentioned above. These various kinds of rights overlap and are dynamic, negotiated and renegotiated among the various actors. Not all rights derive from the state. Informal or customary rights, such as religious rights, may play an important part in managing resources at the local level. For example, women may find themselves limited in operationalizing certain formal rights if various customary rights assign the role to manage resources to men (Meinzen-Dick and Knox 1999).

2.4 The role of collective action in community-level resource management

Collective action is defined as “*action taken by a group (either directly or on its behalf through an organisation) in pursuit of members perceived shared interest*” (Marshall 1998, emphasis added). The term “shared interest” implies the fair representation or the participation of all users in decision-making regarding resource use, development and conservation (political equality) and in benefiting from the resource (livelihoods). Collective action is expressed through collective decision-making about and the practicing of rules of using (and refraining from use) a resource, monitoring use, resolution of disputes and sanctioning. The actions of a user are usually under close observation by other members of the community of users and the major governance mechanisms are formal rules as well as “*solidarity, reciprocity and social pressure based on common norms and values*” (Meinzen-Dick and Knox 1999: p. 46).

The need for collective action among users¹ in the management of the commons arises from certain characteristics of common-pool resources. The first two characteristics are due to the physical attributes of a given resource. First, it usually is too large to exclude others from using it (exclusion). Second, its supply is limited, so the use by one actor reduces its availability to another (subtractability) (Tang 1991; Hardin 1968). Irrigation systems are perfect examples of a common-pool resource. Once the infrastructure is constructed, it is costly (although not impossible) to deny access to users. Water is also limited, so the amount allocated to one user is no longer available to another (Tang 1991). Exclusion poses a challenge as to how to control access to the resource; subtractability is concerned with distribution, in other words with the dilemma of instituting “*rules among users to solve the potential divergence between individual and collective rationality*” (Berkes *et al.* 1998: p.6). Collective action is also needed when there is multiple use of the resource. Irrigation water that is used for agriculture, may also be used for domestic purposes and may also supply water to livestock (Meinzen-Dick and Knox 1999). In terms of field irrigation, different crops require different amounts of water and at various intervals. In these cases, rules for use must be negotiated between users, taking into consideration the needs of each. Meinzen-Dick and Knox (1999) write that local collective action may be instrumental in finding management solutions that are seen as equitable by the users themselves (p. 47).

With respect to irrigation water, Meinzen-Dick and Pradhan (2001: p.13) state, “*capturing and conveying water to the locations where it is to be used requires collective effort, both to appropriate and convey water and to make and rules for appropriation, allocation and distribution*”. According to Vermillion (2001), collective action in irrigation management usually takes three basic forms. The first is constitutional action, which establishes the organisational body through which resources are managed. In the case of this research, these are the WUAs that have been established in Central Asia as a part of the

¹ Arguments regarding the inability of state agencies to effectively and sustainably manage the commons have been established. The third alternative, the management of the commons as private holdings is often not feasible because of the great deal of internal variation and the interdependence with other units that makes the provision of individuals with a viable piece of the resource very difficult (Meinzen-Dick and Knox 1999).

decentralization of water management and the devolution of responsibilities from the government to the users, and informal organisations. The second type, which Vermillion (2001) calls collective choice processes refers to rules and sanctions for operation and maintenance of the system once established. The third type refers to its operational actions that include the implementation of operations, maintenance and dispute resolution. These three types have a hierarchical relationship. Constitutional action determines collective choice, which in turn determines operational actions.

Vermillion's description of the types of collective action is limited to those actions that arise as a result of the formal establishment of a group or an association. However, while collective action is often developed through formal channels (introduced by NGOs or government agencies), it may also arise from sources outside a formal organisation, either through traditional institutions or spontaneous cooperation (Meinzen-Dick *et al.* 2001). It can be a one-time event or recurrent, in which case it becomes institutionalized. Institutionalization of a particular form of collective action is likely to occur, if it is in the recurrent need of a community of users.

Problems arise when cooperation would be in the users individual and collective interest, but when cost of cooperating with others exceeds the expected benefits. In that case individuals are tempted not to cooperate, even if it is clear to them, that non-cooperation will damage the collective effort. The problem has been described in the literature as the prisoner's dilemma, free-rider problem, or the problem of collective and public goods (McKean 1992; Rydin *et al.* 2000).

2.5 Theories of collective action

There are two main lines of school of collective action. The first uses institutional and economic analysis of local-level collective action to establish certain principles or conditions for the emergence of collective action institutions (Ostrom 1990, 1992; Tang 1992). Mainstream institutional theory follows the tradition of Thomas Hobbes and Adam Smith for whom a person is a rational self-interested individual (*Homo economicus*) and acts as

such. Institutional theory pictures institutional formation as a managerial activity, whereby “successful” institutions can be crafted by external agencies, often in the form of formal organisations. They often function based on economic rationality and without being embedded in the local context (Upton 2005). The theory states that, under certain conditions users of a resource will cooperate and predict the conditions under which cooperation is most likely to occur (Mosse 1997). For example, based on the review of traditional community-managed irrigation systems, Tang (1992) and Ostrom (1992) observe that a community may successfully organize in those areas where there is a population pressure or a limited supply of water or both, where the organisation of community labour and management is essential to gain access to and share water, and to minimize conflicts. For users to get together and try to resolve collective action problems, they must have a strong interest in the resource (for example they depend on that resource for their livelihoods) (Mearns 1996b) and mutual vulnerability defined by Singleton and Taylor (1992) as *“the condition of a group of actors something which can be contributed or withheld by others in the group and can therefore be used as a sanction against the actor”* (p. 315). Other characteristics of the resource and the users that may support the emergence of collective action are: the presence of social capital, defined as *“a history of cooperation and networks among group members”*; a community with negligible differences in socio-economic conditions and in divisions (that would prevent communication among users); effective local leadership that also has the trust of community members (Meinzen-Dick and Knox 1999).

The second school, the post-institutionalist approach, focuses on the role of traditions, moral codes, social rights and value systems in generating and preserving common resource management systems. Its line of thought is associated with that of Durkheim, according to whom each person is firstly a social being (*Homo sociologicus*) and individual considerations and attitudes are only secondary. The post-institutionalist approach pictures institutional development as an opaque, socially embedded process. Institutions are “shaped by historical factors, by the power relations which prevail in social life and by world views” write Cleaver and Franks (2005: p. 4).

Mosse (1997) points out that one of the most significant limitations of the institutionalist school is the narrow and utilitarian view of institutions of collective action. He writes that often institutions are viewed as entities that are isolated from larger structures that, in reality surround them and influence the way they function. Collective action within those communities is pictured as “narrowly utilitarian and economic, effecting the separation of resource management from other aspects of social life” (p. 470). He does not reject the idea that common pool resource management – where it emerged and was maintained – was the result of individual strategy, but suggests that, in order to understand common-pool resource management systems, the role of institutions in mediating individual strategy and the social relations behind them have not been taken into account (p. 472). He says that:

“...attempting to account for the strengths and weaknesses of institutions of resource management in terms of the balance of individual economic costs and benefits gives little recognition to the fact that material interests are often inseparable from social relationships, and that choices are mediated by shared assumptions about such things as justice, fairness and reciprocity (Douglas, 1986; Spencer, 1990: p. 98)” (Mosse 1997).

Over the past 30 years, theory about the decentralization of natural resource management was translated into practice. Common-pool resource theory underpinned implementation on the ground and has dominated research. Saunders (2014) argues that the outcomes of these projects have been disappointing and that common-pool theory may have contributed to failures. Central to his thesis is Elinor Ostrom’s work on common-pool resource theory “because of its iconic and influential status and its explicit concern with praxis.” (Saunders 2014: p. 638). According to Saunders (2014), and echoing Mosse (1997; 2003), successful cooperation among users is strongly influenced by interdependencies through kinship and networks rather than formal institutions leading back to arguments raised earlier about visible and invisible institutions and their roles in water resources management.

Ostrom’s communities have been depicted as relatively small sized, homogenous and isolated (Ostrom 1990). Cleaver (2012) and, in its latter work Ostrom (2010) explores the idea of policentricity, where those communities, with perhaps varying interests, are linked

within a network and range of institutions within water governance. They are able to solve problems by themselves in a context where being embedded in a complex web of institutional arrangements, including with the government.

Edelenbos and van Meerkerk (2015) explore the role of trust and boundary spanners within these networks. Trust is defined as “a stable positive expectation that actor A has (or predicts that he has) of the intentions and motives of Actor B in refraining from opportunistic behaviour, even if the opportunity arises” (Edelenbos and Klijn 2007). Trust develops within informal networks (Folke *et al.* 2005). According to the authors, trust plays an important part within an informal network (and outside the boundaries of formal positions) providing opportunities to get to know other actors’ drivers, interests and values. It stimulates interaction, coordination and information exchange among various actors and increases opportunities for partnerships both within and between formal and informal institutions. In this case, the possibility that actors invest money and knowledge in developing resources in a collaborative manner is more likely.

Resolving effectively complex water issues within a system of resource management requires effective information sharing among the relevant stakeholders. Edelenbos and van Meerkerk (2015) calls boundary spanners those who are able to link members of the organization that they represent with various other organizations operating at various scales and select and channel information. These members must be willing to conceptualize together issue and problems, seek solutions and exchange or pool together resources. Through linkage-building, boundary spanners play an important role in trust-building between members of informal networks and those acting within a formalized structure. Edelenbos and van Meerkerk (2015) note that high-trust relationships could lead to insulated networks and communities which may hamper participation of the community in larger networks.

The following is a review of what is already known about the communities and formal and informal institutions in post-Socialist countries. Based on that knowledge, arguments that support the theoretical approach advocated by Mosse (1997; 2003) will be presented along with some justifications for employing his approach in the research at hand.

2.6 Formal and informal institutions in post-Socialist countries

This section presents a literature review of formal and informal institutions in post-Socialist countries in Central Asia, including the research area and the larger Ferghana Valley. The research location is described in greater detail under section 3.2 entitled “Research Area”.

As a result of the collapse of many of the state institutions in the early 1990s, an institutional vacuum was created and most of the management roles fell into the hands of local users. State water management organisations that were designed to service cotton mono-cropping collective farms, are unsuited to deal with thousands of small farmers “growing different crops and applying different agronomic and water management practices” (Abdullaev *et al.* 2008). There is a need for the emergence of voluntary collective action to fill that institutional vacuum. At the same time, due to the history of top-down management, its emergence in the transitional context poses particular challenges. As Mearns (1996a: p.1) notes, “*the language of collective action is unfortunately associated in the former Soviet Union with the failed experience of agricultural collectivization*”.

Communities of users cannot be assumed to exist universally or to have the capacity to create sustainable resource management regimes. In those communities where users managed the resource for less than one generation, or in those where the rights and responsibilities of users over the resource have been reduced or eliminated due to government or private-sector intervention in management, collective action institutions may have weakened or disappeared and local know-how forgotten (Meinzen-Dick and Knox 1999). Communities in post-Socialist countries experienced major disruption and discontinuities in their societal and economic organisation. One of the more recent of those disruptions was Soviet-era collectivization (Mearns 1996a). Following collectivization in the 1930’s, institutions within ex-Soviet collective farms operated based

on hierarchical relations and on top-down decision-making.² According to Mearns (1996a), the history of central management of natural resources contrasts with most customary self-governing institutions that are characterized by bottom-up decision-making, trust and reciprocity and a high degree of commitment among members. Additionally, while in the case of Soviet style management “*strong ideological and social norms*” were imposed, in the latter case community-adopted norms guide individual behaviour (Mearns 1996a). Lerman *et al.* (2002) explores the same in the following exert, pointing out that the most significant difference between Soviet- and western-style cooperation is that while the former was force, the latter has always been voluntary:

“...whether identified as collectives or cooperatives, the socialized farm structures were very far from the Western model of a cooperative: the main attribute of cooperation - the principle of voluntary association for mutual benefit - was abandoned during Stalin’s forced collectivization campaign in 1929-1930. Instead, the creation of all collective and cooperative farms in the former socialist countries (both before and after World War II) relied on political and psychological coercion and was often associated with considerable brutality against the rural population. As a consequence, members in collectives and cooperatives never enjoyed another basic attribute of Western-style cooperation - the freedom of exit.”

After independence in 1991, in order to reverse the top-down management trend, to adopt the worldwide trend of irrigation water transfer promoted by donors and to relieve the state of managing irrigation systems, responsibilities for I&D management were handed to municipalities, or WUAs created for that purpose. WUAs were first introduced in 1995, with the purpose of undertaking local-level irrigation and drainage management. By April 2004, 59% of the irrigated land area was managed by 353 WUAs.

It appears that, in Kyrgyzstan, the mobilization for WUA establishment, instead of being a grass-root response to solving problems related to irrigation water management (Wegerich 2000) has been donor driven³. Their establishment followed a top-down approach. They

² This type of centralized management where farmers are seen as workers of the land (not as decision-makers) are called « estate mode » in Africa, where smallholder irrigation themes were managed through an elaborate centralized system (Shah *et al.* 2002)

³ Sehring (forthcoming) writes that international donors put IMT policies and the establishment of WUAs as a condition for receiving grants.

therefore have not been sufficiently embedded in the communities, which they serve (Hassan *et al.* 2004). In the early years of WUA implementation, Sehring (2007) wrote that, in the context of her research, WUAs could not be seen as participatory mechanisms for the simple reason that users had little awareness of their purpose and functioning. The failure of some WUAs to serve as participatory mechanisms may be explained by the fact that, as explained earlier, participation is low on the initiator/implementer's agenda.

More recently and building on substantial evidence of WUA performance over 10 years in Uzbekistan, Moss and Hamidov (2016) examine representation, leadership and regulation within WUAs there. They find that representation is generally weak within the WUAs. Inclusion and consultation, real dialogue, among and with WUA members are lacking and representation is left to paid officials, mostly to the Chairman of the WUA. They find that WUAs generally act on behalf of the members but not at their behest. Moss and Hamidov (2016) note that the development of inclusive and collaborative governance is challenged by the strong legacy of hierarchical leadership in the country. Leaders of WUAs and WUGs need to command respect and cooperation from members. However, old elites still command considerable influence with regard to these positions, raising the risk of patronage and clientelism. Challenges also emerge around regulation. Water requirements for planned crops prepared by the WUA is often rendered redundant by the Basin Irrigation System Authority that imposes its own quotas without regards to the needs expressed by the WUA. According to Moss and Hamidov (2016):

“The experience of WUAs in the Uzbek section of the Fergana Valley – and not only there – is a sobering one. Whilst it is perhaps inevitable that the WUAs could never meet all the expectations made of them at their inception, their general lack of impact on irrigation services and water governance is indicative of deeper, structural weaknesses in water and land management. WUAs in Uzbekistan are, in essence, not really water users associations at all, in that they were created by central government decree, permit only minimal representation of water users and operate to satisfy state targets for cash crops in accordance with state quotas for water allocation.” (p 164)

In the tradition of Putnam (1995), a network of civil society actors generate trust among individuals and are able to create or strengthen collective action (see also Chapter 2, Section 2.5). The “traditional” civil society covers a broader range of actors and

organisations *“that are a means to an end: a potential force for positive change through people’s participation and empowerment.”* (Giffen *et al.* no date). The alternative approach can include ideas of ‘traditional’ or ‘communal’ civil society. The link among these actors *“is the use of the concept of civil society to legitimize their right to resist the prevailing development paradigm”* (Howell and Pearce 2001: p.36).

Giffen *et al.* (no date) write that there is various understanding of civil society among policy-makers, academics and practitioners inside and outside of Central Asia. At this time, as a result of the direction development has taken and the dominant policies, a certain model of civil society is being created and promoted, notably by international organisations. One aspect of this is the promotion of non-governmental organisations (NGOs). Another is a lack of understanding of the interactions and practices that have evolved in these societies over time.

According to Olivier Roy (2002), there is an argument that civil society does not exist in Central Asia and has to be created is prevalent because *“...there is nothing of value today upon which to build (the entire Soviet legacy being cast as negative) – or because there is no such thing as a traditional society in Central Asia, owing to the onslaught of the Soviet system on previous social structures.”* Olivier Roy (2002) notes that Central Asian countries are endowed with an “immense social fabric”, which are prevalent in the strong social networks running across families, kin, villages and in the form of community interactions. This richness of the social fabric is also expressed through pre-Soviet, Soviet and contemporary institutions. In contrast with the “neo-liberal” approach, he describes what Freizer (2004) terms communal civil society, a space for informal groups and group activities that are established based on trust and reciprocity and are frequently based on kinship relations. It does not address state-society relations. Rather it treats relations within the community. It *“contains repression as well as democracy, conflict as well as cooperation, vice as well as virtue”* (Robinson and White 1997, quoted in Freizer 2004).

The *kolkhoz*, although much neglected in the development literature and in scholarly research, remains a “part of “real” society, civil or not” and its memory continues to

represent collective identities (Roy 1999). According to Roy (2001), during the collectivization, traditional solidarity groups, or clans, turned into collective brigades but kept their traditional roles. During the communist era, the Soviet influence in rural Central Asia was limited. Many of the leaders of the *kolkhoz* were of local origin. Being far from the centre of power, they functioned more as local leaders, than as apparatchiks. During the period when farmers turn to private farming they continue to rely on the collective identities that were inherited to protect them from state encroachment and privatization. The traditional solidarity groups - clan networks - were, therefore, little transformed by the Soviet-era and managed to regain their role during the de-collectivization period.

“the Central Asian kolkhoz produced new clans and tribes, as patronage networks and extended family tribes woven inside the kolkhoz stretched and thrived outside the kolkhoz. Here we have the revenge of a traditional culture and society on an imported system” (Roy, 1999).

Upton (2005), who researched institutions among Mongolian herders after the demise of the Soviet supported collectivized agricultural sector, also notes the importance of the institutional elements of the collective era. According to her research findings, customs and traditions that are held among Mongol herders are informed by the various experiences during the collective period and an *“idealized precollective past”*. Bichsel (2006), while examining how socially embedded institutions are used in a Mercy Corps project in Kyrgyzstan to *“increase the community’s sense of ownership towards the outcome of the project”* (p. 108), notes that a project was purposefully built on existing organisations, such as community labour, elders, youth summer camps and religious or secular organisations. Among those, community labour and youth camps are identified as Soviet era, while others as pre-Soviet (p.115).

Due to the resignation of farmers to the fact that they cannot count on government support for I&D management there is evidence that socially embedded institutions provide services that government institutions are not able to (Thurman 2003). He writes that WUAs *“are not able to supervise every outlet, and therefore the people themselves must help in supervision”* (p. 28). In particular, farmers take part in the traditional *ashar* (Bichsel 2006) and *avandaz*, the management of water delivery to fields (Thurman 2003). *Ashar*, which means voluntary collective work and where a group of people, acquaintances and

relatives are mobilized to help a household in such activities as harvesting crops or building a house is an institution of collective action that was common in the pre-Soviet period. Today it appears to be in decline in terms of inter-household cooperation, but it resurfaces and is endowed with new meanings, such as community self-help groups in the larger context of institutional transformation. Another traditional institution, the Elders' Court that operates based on traditional and customary law, plays an active role in conflict resolution (Thurman 2003; Bichsel 2006). Bichsel (2006) writes that its role is being formalized by the State, which seeks to *"introduce traditional institutions with the purpose of nation-building, but also for outsourcing services that it was not willing or capable to assume"* (p. 116).

Moss and Hamidov (2016) note the recent emergence of Water Users Groups (WUGs), which are self-initiatives organized by the water users to seek solutions to local water conflicts organize rules for distribution and monitor water allocation. These groups emerge parallel to WUAs. They are self-organized institutions that grow out of former collective farm brigades, extended families, or clans, etc. creating further evidence of the continued persistence and importance of informal and traditional institutions. WUGs do not have legal rights or representation and their degree of influence and power within the WUA depends on the WUA Chairman's willingness to share power and representation. Although, WUGs are recent and there is limited experience of their capacity for collective action, there is a sense that they create greater power for decision-making among users, creating a greater sense of collective responsibility and may stimulate communication and learning in WUAs. (see also Chapter 2, Section 2.5).

Based on Moss and Hamidov's (2016) observations of irrigation water management in Uzbekistan, it would seem that the emergence of WUGs resonates with Lankford and Hepworth's (2010) "bazaar" model of water management. Rather than a "cathedral" model of hierarchical, centralised institutional framework, the "bazaar" model allows the co-existence of a network of decentralised, horizontal and polycentric institutions. According to Moss and Hamidov (2016), the "bazaar" model is especially suited to situations characterised by "little reliable data, fluctuating water supply and demand and

under-resourced regulatory agencies – all factors prevalent in the Fergana Valley”. (see also Chapter 2, Section 2.5).

This research adopts a conceptual framework that builds on a contextual and dynamic understanding of institutions by extending the definition of institutions from formal rules, norms and organisations to more informal opaque, formally embedded products of their political, economic, cultural, social and religious environment. This approach seems justified, given the richness in the history of Central-Asian institutions – formal and informal – and the recent changes in them as a result of larger political and economic decisions and state structures that are now driving the actions and incentives of people in relation to institutions.

2.7 Households and livelihoods

To understand the stakes that farmers have in managing their resources, one must understand the importance of irrigation water for livelihoods. Messer and Townsley (2003) define households as *"...a group of people who eat from a common pot, and share a common stake in perpetuating and improving their socioeconomic status from one generation to the next."* Livelihoods are the strategies that households use to make a living, to ensure food and income and achieve relative well-being. Livelihoods include the various capitals that influence well-being – human, physical, social, natural and financial, the activities that they employ to satisfy needs, certain factors that people cannot influence (weather, natural disasters and economic trends) as well as the institutions that guide their activities.

Messet and Townsley (2003) writes that *"institutions affect the different livelihoods and capitals that people use for their livelihoods – by controlling access to those assets, or by influencing how, where, when and by whom they are used"* (p.16). Or, looking at it another way, households take into consideration the resources, rights and institutions available to them to find the most appropriate livelihood strategy possible. Therefore, to understand what shapes collective action in building institutions in a particular context, the importance

of irrigation water to local livelihoods must be understood. Since the research focuses on irrigation water management on the scale of the community, one particular aspect of livelihoods, farming, must form an integral part of the research. Land- and water use are intimately related. The size of the farm, the modes of farming techniques that the farmers use to cultivate crops and the choice of crops determine needs for irrigation water as well as the strategies that are suitable to achieve sustainability. Engagement in farming activities means that the farmer would have an interest in participating in irrigation water management, while someone who holds a day job would have less time to participate in decision-making about distribution and maintenance.

Additionally, to understand the opportunities and incentives that users may have to participate in collective action and their powers to participate in the negotiation of the “rules in use”, users cannot be conceptualized merely according to their productive roles, such as ‘farmers’ or ‘irrigators’. This is because these terms do not fully and adequately reflect the social identities of the users (members of a minority group; women), which influence their opportunities in negotiating access to and control over the I&D system (Cleaver and Franks 2005).

To describe the social identities of the users, this study will use the livelihood perspective. The livelihood perspective, as defined by de Haan and Zoomers (2005), does not merely allow to map the strategies that people adopt to obtain productive resources or increase their productivity, but it also encompasses all the strategies which are available to them to act, including claims and access to resources and the right to participate in decision-making about the management of a particular resource. The livelihood approach will also allow for the mapping of livelihoods and irrigation water needs and endowments.

Chapter 3 Research methods

3.1 Research approach, data collection and analysis

This research looks into issues and challenges related to irrigation water use and management on the local scale. The case study approach was chosen as the framework of inquiry. In the framework of the case study approach, the inquiry was built through a literature review that explores historical and contemporary rural, agricultural and irrigation issues in general and in the Central Asian context. During a three-month long fieldwork, information was gathered first hand through interviews (open-ended and in-depth) with farmer members of WUA, with officials of government irrigation agencies, with representatives of informal organisations and through participant observation. In this chapter, the framework and the methods used in the research and their limitations are presented. The research location is introduced and considerations that influenced the selection of the research location and the criteria of the selection of interlocutors are explained. The chapter also includes reflection on issues, problems and limitation that I, as researcher, encountered during the fieldwork.

The framework for the data collection was the case study approach. Yin (2003) supports the use of the case study approach in circumstances when a research examines complex and contextual contemporary phenomena over which the researcher has little or no control. Moreover, in documenting and writing a case study, the researcher may rely on multiple sources of evidence, based on various methods of collecting information (literature review, observation, various interviewing methods), he writes. While conventional opinions judge the case study method unsuitable, because, among other criticisms, the context is uncontrollable, giving too much scope for interpretations by the researcher thereby making it unsuitable for rigorous scientific inquiry, Flyvbjerg (2006) argues in favour of understanding context-specificity in researching human behaviour. According to him, taking into consideration the fact that human behaviour is much more complex than to reduce it to rule-governing facts, a case study provides an opportunity for

the “nuanced view of reality”. He adds that the proximity of the researcher to the object of study provides an opportunity for concrete experiences, for feedback and avoids the “academic blind alleys, where the effect and usefulness of research becomes unclear and untested” (p. 223). By the following citation of Campbell (1975, cited in Flyvbjerg 2006), he indicates the necessity of making research into human behaviour context specific and the inherent bias in any such research:

“After all, man is, in his ordinary way, a very competent knower, and qualitative common-sense knowing is not replaced by quantitative knowing. . . This is not to say that such common sense naturalistic observation is objective, dependable, or unbiased. But it is all that we have. It is the only route to knowledge—noisy, fallible, and biased though it be. (pp. 179, 191)”

Baxter and Eyles (1997) express concerns over “rigor” in qualitative research where a researcher is faced with the tension between the “creativity of the qualitative research process – which implies contingent methods to capture the richness of context dependent sites and situations – and evaluation – which implies standardized procedures and methods of reporting” (p. 505). They recognize that the “characteristics” of the researcher in interpreting the findings is gaining increasing importance in qualitative research. They suggest that the reflectivity of the researcher in terms of explicitly acknowledging the research processes (fieldwork, data analysis and interpretation) and their limitations is an important tool in making research “rigorous” (valid, reliable and objective, responsible and honest).

The literature review was based on past and current academic work on irrigation decentralization. Through networking with fellow researchers, I tried to incorporate the results of the most recent research in the literature review and identify issues that needed to be further explored. To grasp institutional change during the pre-collectivisation, collectivization and post-collectivization eras and to set the larger institutional context, a historical analysis of pre-Soviet and Soviet era irrigation institutions formed the part of the literature review.

In collecting data, I relied greatly on participant observation, which involved my presence in the field and participation in farmer's activities. I chose to stay in one of the villages in the region where I wished to study irrigation practices. Staying in the research location and living with a farmer family allowed me to be present at all times creating suitable conditions for participant observation. Jorgensen (1989) writes that participant observation in human studies is a suitable method of data collection when the research is about human meanings and interactions best observed in everyday life. The phenomenon or activity must be sufficiently limited in space and time to provide a suitable subject for observation and qualitative data is sufficient to answer the research question. In my case, learning about the livelihoods, the culture and the religion was very valuable in understanding people's behaviour towards each other when it came to sharing resources. Being present, I was able to profit from chance encounters (which allowed for casual conversations, in-depth, open-ended interviews and transect walks to collect information for case studies). I studied irrigation practices by participating in the daily activities of farmers and from my point of view, this was the only strategy by which I could gain a deep insight into the culture and livelihoods that otherwise (through, for example, random visits) would have remained unknown to me. Once I became known, I was invited to lifecycle celebrations, to marriages and to an endless number of teas, that helped establish friendships, respect and trust between the users and I.

My participation throughout the fieldwork varied between *moderate* and *active participation* (DeWalt and DeWalt 2002). DeWalt and DeWalt (2002) describe active participation as a situation when the researcher engages in the community's activities in order to learn about rules of behaviour, while in the case of moderate participation, the researcher is present in the communities and identified as a researcher, but instead of actively participating, he/she acts as an observer who only occasionally interacts with the people. My research was overt (Whyte 1984), meaning that people around me were aware of my interest and purpose, an awareness which in some cases certainly biased the research by influencing farmer's behaviour towards me. On the other hand, choosing a "degree" of participation was not a conscious decision on my part. Rather, it was determined by the circumstances and by the people surrounding me.

Interviews with water users and with officials were central to this research. Of the 41 interviews that I conducted 35 were with farmers within one canal system and encompassing two communities and six with various officials. Out of the 35 interviewees, 13 were women and 22 were men.

The selection criteria based on which the survey population were selected were:

- irrigation water users. Their source of irrigation water is the Dzsijde-Munduz canal;
- rights holders. They held water rights water and made an agreement with the WUA for water delivery in exchange for payment (or were the relatives of those holding rights and lived in the same household);
- small landowners.

Given the conflicts between those who own lands situated upstream and downstream (or at the head and tail ends along the canal), the survey population included farmers from both the head and tail ends.

The research was conducted during the irrigation season and farmers were approached during transect walks while making field observations. The timing provided an opportunity to observe irrigation practices and irrigation issues that were on the minds of people and were frequently subject of conversations. Approaching farmers during transect walks required *opportunity sampling*, or on the spot decisions about sampling, as well as informal conversational interviews (one-on-one) and informal group interviews. This sampling technique is well suited for direct observation, because it offers maximum flexibility to pursue information. It also allows for expanding on information gathered previously and building on interviews already completed. For more in-depth understanding of how certain institutions function, I made use of methods that are usually classified under *purposive sampling* (or judgment sampling). Based on earlier interviews I selected information rich cases for in-depth, unstructured interviews (Patton 2001). Interviews with representatives of local-level bureaucratic organisations were undertaken through direct contact and *snowball sampling*, or “identifying cases of interest from sampling people who know people who know people who know what cases are

information rich, that is, good examples of study, good interview participants” (Patton 2001) thorough contacts at various formal and informal organisations and during random interviews in the field and on other locations.

My interpreter also acted as my main informant. He, as a well-known and respected member of the community and a part-time farmer himself, ensured my access to the communities of users. He taught me much about the culture, about how to respectfully present myself in front of farmers in the traditional and Muslim communities that I studied; about farming and irrigation problems, and offered precisions regarding geographic, historic, cultural and religious issues. My interview strategy consisted of interviewing a large number of farmers, most of them only once. Being very busy and in the midst of the irrigation season, they seemed to be, except for a few examples, reluctant to meet me more than once. While the first meeting does not usually allow for “building rapport” and results mostly in normative statements (Whyte 1984), I found that most farmers seemed open, talkative and comfortable in my and my interpreter’s presence.

The main tools of data collection were open-ended questionnaires. In her analysis of the particularities of doing research in post-Soviet countries, Kandiyoti (1999) questions the suitability and usefulness of surveys and closed-ended questions as they provide limited freedom to uncover the subtleties of various concepts, and therefore the opportunities to gain in-depth understanding of the context. In the case of open-ended questionnaires, the interviewer still guides the conversation, but leaves much more freedom for the interviewee to describe their own experiences. The use of open-ended questionnaires still ensures that the same topics are covered, and that a comparison of data is still possible during the subsequent analysis.

A list of questions that I used as a guide for the interviews is presented in Annex A. To measure the performance of collective action, the study explores institutions and gives a description of their characteristics (participation in making rules, collective decision-making, observing rules and putting them in practice collectively, sanctioning). Therefore,

the majority of the questions focuses on whether or not users employ institutions and participate in various organisations or spontaneous cooperation to access and manage the I&D system and how those institutions function. Some questions focused on the characteristics of users and their households, including their livelihood activities and socio-economic characteristics. Questions pertinent to user water needs and endowments, including alternative water sources, were also included. The degree to which individuals and households rely on irrigation water and to which the resource is available to them (from irrigation canals or from other sources) helps estimate the stakes and incentives that users have in institution building. The socio-economic data help determine which strata of the population (based on wealth, gender, religion and ethnicity) participate in which institution/spontaneous cooperation and identified those who are marginalized.

The questionnaires that I drafted prior to the fieldwork, and that contained mostly open-ended questions (and some closed ended questions), were changed and finalized after getting to know the communities and having completed the first few interviews. The initial questionnaire was quite broad, covering issues related to all three types of landholdings, such as shareholders land (*ülüs*), kitchen gardens (*tamorka*) and government-owned lands (*arenda*). After the first interviews I realized that covering the issues related to the management of the three types of landholdings brought out broad and complex issues, to which I could not have done justice over a three-month long field research period. I therefore decided to focus mainly on *ülüs* lands, as they seemed the most significant in terms of livelihoods and of the change from collective to individual farming. Table 2 presents the main variables, measures and data collection techniques that I used throughout the research.

Table 2 Main issues and aspects of inquiry, and data collection techniques

Main Issues	Data collection techniques
Location of land (head/middle/tail)	Interviews with local authorities (water managers); semi-structured interviews with farmers; transect walks and observations
Existence of alternative water supply (rainwater and well)	
Size of group	Interviews with farmers; transect

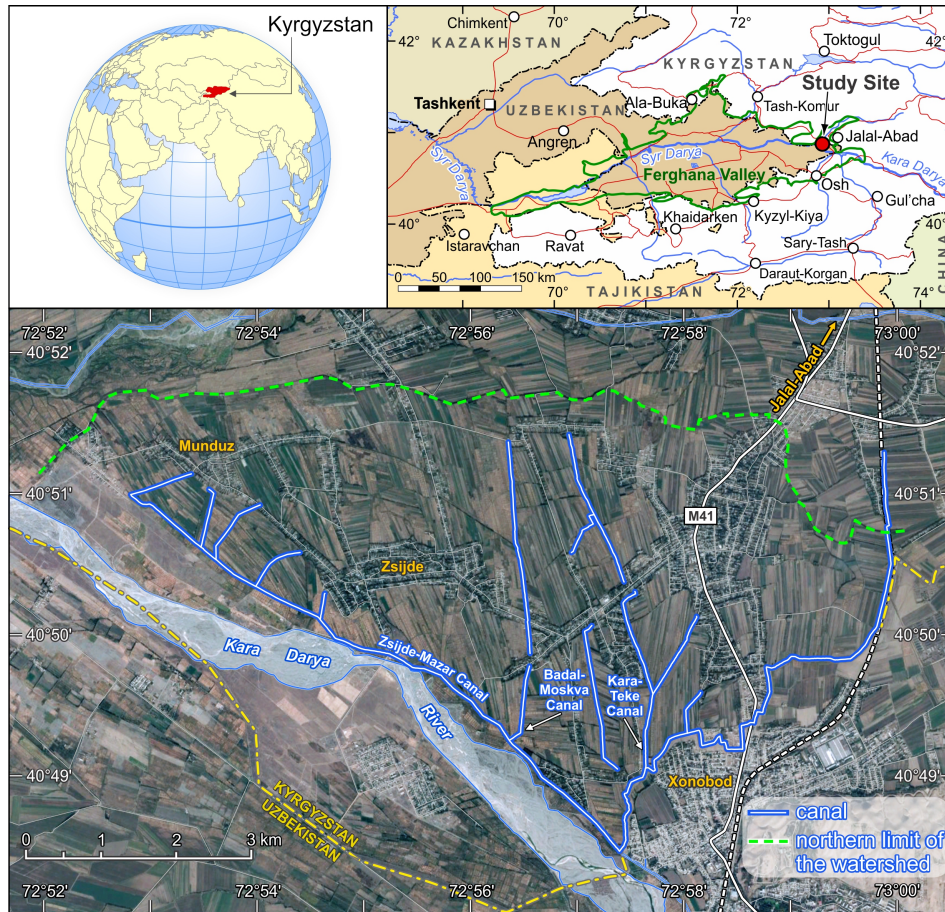
Socio-cultural and economic heterogeneity (gender, religion, ethnicity, wealth)	walks and observation
Livelihood strategies	
<i>De jure</i> rights on international, national and regional and local levels	Interviews with local authorities (water managers); study of literature
Local rules regulating use and management of I&D system (regulation of access, monitoring, penalties for free-riding);	Literature review; transect walks and observations;
<i>De facto</i> rights;	in-depth interviews; interviews with local authorities
Characteristics of institutions that guide I&D management (including violations, frequency of free-riding behaviour);	
Characteristics of collective labour input and of spontaneous cooperation;	
Characteristics of decision-making	

Due to the large number of interviews and the diversity of data, I chose to code the data by hand. Transcription of each of the interviews was followed by arranging the information on an excel sheet, under various categories and sub-categories. These columns of groups and sub-groups later provided a practical way to review all the information collected under one category and draw various conclusions. I choose data for citation based on the ability of it to convey and support arguments that were present in other interviews but not so forcefully. Citations that described some unique phenomena (for example free-riding) were also chosen.

3.2 Study area

The fieldwork took place in the Ferghana Valley in Central Asia (Figure 1). The 370 km long and 190 km wide Ferghana Valley is the largest valley in Central Asia. The area forms part of the Syr Darya basin, which, together with the Amu Darya basin makes up the Aral Sea basin. The region is semi-arid. Average annual precipitation at the research location ranges between 500 and 750 mm, much of which falls between October and April (AQUASTAT). The soil is *siernozem* in complex with alluvial soils. The vegetation in the Kyrgyz Ferghana is characterised by the Water Resources eAtlas (no date) as cropland/natural vegetation mosaic. Natural vegetation, including some extensive walnut and evergreen forests, is more characteristic to the foothills of the mountains in the area, while low-lying regions, such as the research location, are heavily cultivated and irrigated.

Figure 1 The research location



Cartography: Marc Girard and Blanka Füleki, Université de Montréal, 2016

Irrigation water at the research location is retained by the Andijan Reservoir, which itself is fed by the Kara Darya. The Andijan reservoir was built in 1975. Its total storage capacity is 1 750 million m³.⁴ Although the rivers that feed the reservoir and the greater part of the reservoir's territory lies in Kyrgyz territory, the reservoir's outlets are controlled by Uzbekistan, which gives five percent of the total amount of water stored by the reservoir to Kyrgyzstan.⁵ The actual amount fluctuates according to the amount of water available

⁴ Author's interview with official of *OblVodKhoz*, July, 2008.

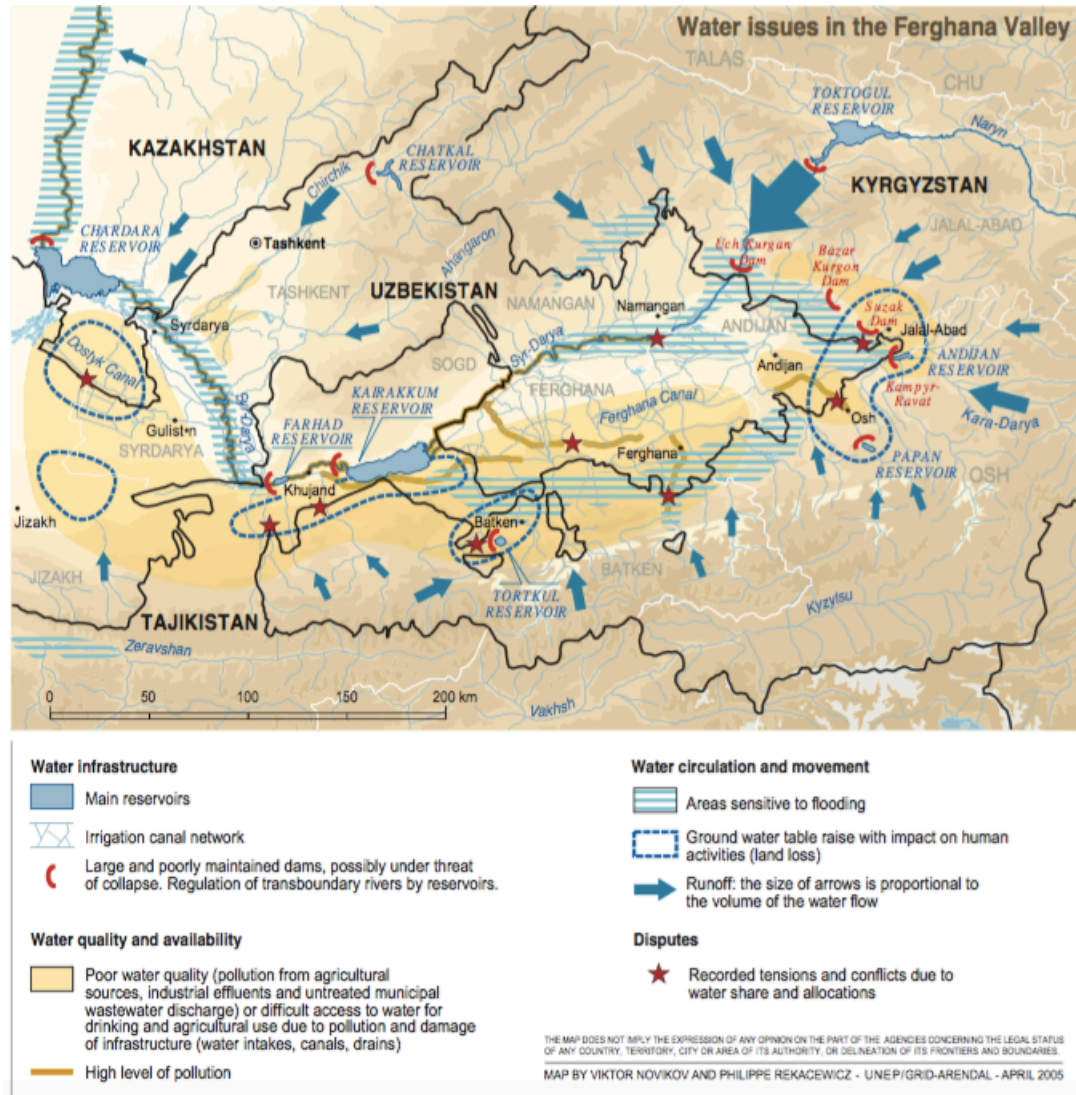
⁵ Author's interview with habitant of Munduz, May, 2008.

in the reservoir⁶. Depending on the weather conditions, sometimes more is allocated and sometimes less. The water allocated for Kyrgyzstan is conveyed via an open surface lined canal, named *Kara Darinskia Obidnjaesy*, (“KDO”). Its capacity is 34 m³/sec. A number of larger and smaller (0.3 m³/sec and 0.6 m³/sec) secondary, also called distributary, canals branch off the KDO. One such canal is the Zsijde-Mazar canal. It delivers water to the villages within the study area. Its capacity is 2.2 m³/sec. Its length is 49,77 km and it irrigates 1 048 hectares of land.

The Ferghana valley forms the backbone of agriculture in Central Asia. All three countries, Uzbekistan, Kyrgyzstan and Tajikistan, parts of which are situated in the Ferghana Valley, are predominantly agricultural. As the area is populous, there are high pressures on limited land resources, notably in Kyrgyzstan where agriculture employs 53% of the labour force. Agriculture overwhelmingly relies on irrigation and some 45% of the irrigation areas of the Syr-Darya basin are located in the valley. Due to the importance of agriculture to the economy, people depend a great deal on seasonal climate and weather conditions for adequate amounts of water for irrigation. In addition to water availability, access to water, water quality, rising groundwater and waterlogging are the main problems that the area is dealing with (UNEP 2005). The border regions between Kyrgyzstan and Uzbekistan (including the research location) are particularly prone to problems related to water availability and access, the irrigation infrastructure having been built when the borders were only administrative divisions. Tension over the availability or allocation of water is frequent and mainly arises between local communities (sometimes between cross-border communities), and district and regional authorities. Figure 2 shows some of the water issues in the Ferghana Valley in general and at the research location in particular.

⁶ Author’s interview with official of *ObVodKhoz*, July, 2008.

Figure 2 Issues related to water in the research area



Source: UNEP/ARENDAI (2005)

This research concerns itself with irrigation water management in two of the villages situated along the Zsijde-Mazar canal: Zsijde and Munduz (Figure 1). Both villages are located close to the border with Uzbekistan and depend on seasonal water allocation determined by the climate and agreements between Kyrgyzstan and Uzbekistan. Of the two villages, Zsijde is located closer to head of the irrigation system. In 2005, 607 families (3 226 persons) lived in the village. The number of hectare of land that belongs to the villagers is 728. Of that, 78 hectares are *ogorods*, where people grow grain, corn and vegetables. Beside the *ogorods*, people have access to *ülüs* and *arenda* lands. Munduz is

situated further downstream from Zsijde along the canal. In 2005, 365 families lived in Munduz and its population was 1 685. The total area of agricultural land owned by the families is 389 hectares. Of that, 68 hectares are *ogorod* lands, 248,71 hectares are *ülüs* lands and 72,29 hectares are *arenda*. There are approximately 100 hectares of empty lands where cultivation is not possible because of the shortage of irrigation water.

3.3 Limitations

During fieldwork, I mainly to observe irrigation water management by farmers. As the employees of the WUA were mostly absent from the field, there is a risk that I focused too much on the farmer's practices and perspectives and too little on those of the representatives of farmer's organisations. On the other hand, apart from the occasional presence of the main *murab* whom I interviewed several times, the fact that the WUA did not take part in the everyday irrigation practices of the farmers tells a lot about its capacity to represent farmers' needs.

My data about irrigation water availability and issues regarding management is mainly based on interviews and discussions with water users and thus reflect the perception of the users. While I used some secondary data – records on crops, water duties – that was provided to me by the WUA, the *RayVodKhoz* and the *ObIVodKhoz*, I did not perform any independent measurements. Independent measurements would have been a scientifically valid way to verify especially irrigation water supplies and farmers' perceptions regarding scarcities.

My identity as a foreigner and a female caused certain limitations. Some members of the community saw me as a westerner empowered with means and opportunities to help the community and individuals in certain endeavours. That impression, I learnt later, was a legacy of international aid organisations in the era, which, upon visiting the communities, brought money and projects. Nor was my participation as a researcher neutral. Rapley (2004) writes that there is in fact no such thing as neutrality in an interviewee and interviewer relationship. Interviewing is inherently biased through the overarching control

of the interviewers “through questions, silence and responses tokens (e.g. ‘okay’) and chiefly they decide which particular part of the answer to follow up” (Watson and Weinberg 1982 cited in Clive *et al.* 2004). As a woman, I was not completely free in moving around. Many farmers guarded their water at night as freeriding occurred then. I was soon made aware that that part of the day was “off-limits” to me to make observations. My informants considered it inappropriate for me to go as a woman to the fields at night. These limitations turned out to be inherent sources of bias in the research.

One of the factors that limited my participation most was my limited knowledge of Russian and ignorance of the Kyrgyz language. Although with time my Russian language skills improved greatly, I had to rely on an interpreter whenever I wanted to engage in conversations with the users and other members of the community. I designed the questionnaire in English and the interpreter translated it during the interviews. Farmers responded in Russian and the interpreter translated the responses into English. Working with an interpreter paused certain limitations. It certainly paused the challenge of understanding correctly the meaning of the interviews, merely because what was told by the interviewee was not only filtered or interpreted by me but by a second person too, a challenge and limitation that I was constantly aware of.

Conducting the fieldwork during the irrigation season, although beneficial from certain perspectives that I mentioned earlier, also created certain limitations. Farmers tended to be extremely busy and many did not have time for interviews. In other cases, farmers simply refused to be interviewed. This certainly limited a choice of interviewees. Despite those limitations, I attempted to collect information from individuals belonging to various age groups, gender, wealth status and ethnicity as well as from marginalized members of the community.

Chapter 4 The changing political geography and its impact on irrigation management in the Ferghana Valley

In this chapter, first the changes in the political and economic landscape of the Kyrgyz Ferghana is presented. Next, the ways these changes have impacted irrigation water use and management are looked at. A reflection on formal and informal irrigation institutions transformed as a result of IMT also forms part of this chapter.

4.1 Political, economic transformations in the Ferghana Valley

The Ferghana valley has been an important centre of irrigated agriculture since ancient times. Irrigation in the valley has been a crucial determinant not only for economic development but also in shaping the culture and politics of the region. Irrigated agriculture dates back as far as the second century BC. The era preceding collectivization (until the mid 1930s) was characterized by decentralized and small-scale subsistence agriculture. The major crops at this time were mainly wheat, sorghum, barley, millet, rice and alfalfa but fruits and vegetables were also grown.

The first documented large investments into the irrigation infrastructure was made by the Kokand Khanate established in 1709. The Khanate upgraded irrigation infrastructure along major urban centres primarily but also opened up new lands in the southeast of the valley settling previously nomad populations (Bichsel 2009). The nineteenth-century Russian administrator and scholar Aleksandr Fedorovich Middendorf writes about this era that:

“[...] over thousands of years the populace had constructed huge water channels, carried out large-scale fertilization and planted whole forests of shade-giving trees for fruits and wood, with ‘each individual tree being in

need of life-giving water'. The Kokandis planted fields of wheat, barley, millet sorghum, corn, rice beans, sesame, flax, hemp, cotton, and alfalfa while their gardens included melons, water melons, cucumbers, pumpkins, grapes, apricots, peaches, apples, pears, quinces, nuts, plums, cherries, not to mention onions, carrots, beets and other produce. The main grain crop was wheat, which Kirghiz cattle ranchers raised on the lower slopes of the Alai range as a kind of side business. [...]. The expansion of irrigation after the early eighteenth century increased the number of villages and reduced the area available for grazing. Cotton growing always had held a special place throughout the Kokand Khanate, but in the nineteenth century farmers also began cultivating American long-fibred hybrids. (Middendorf 1882: p. 11–12)

In 1876, the Tsarist Russian troops invaded and abolished the Khanate integrating much of its territory into the Ferghana Oblast of the General Governate of Turkestan. The Tsarist administration promoted cotton for export within the rapidly growing textile industry (Bichsel 2009). The administration envisaged in this area a fertile, irrigated, cotton oasis of major dimensions and, indeed, between 1885 and 1916, cotton production expanded in the territory.

From 1917, the Soviet leadership transformed Central Asia. It divided existing territorial units integrating them into new republics and bringing them under one political union. It reorganized the population of the valley along major groups – the Uzbeks, Tajiks and Kyrgyz in the Ferghana Valley. While beforehand the inhabitants may have subscribed to various identities, the ethnic identities that Soviet officials determined at this time became official ethnicities and, later on, nationalities. Political and societal transformation occurred alongside the reorganisation of the economy, the collectivization of productive resources and the introduction of central planning under state management.

The Soviet leadership further expanded cotton production. From 1927, irrigated land was expanded through the construction of a *“highly integrated water distribution and*

irrigation networks" (O'Hara 2000). In Central Asia, including the Ferghana Valley, a total of 7.5 million ha of land was brought under irrigation, much of which was located in semi-dry and dry areas (O'Hara 2000). The Soviet Union, transformed agriculture by collectivization and forming collective farms (Russ. *kolkhoz*) and state farms (Russ. *sovkhos*). Both the *shovkoz* and the *kolkhoz* were subordinate to the state. The irrigation infrastructure developed during the Soviet Era is characterized by "*a complex and hierarchical network of rivers, reservoirs, weirs, major canals, sub-canals, pipes, valves and furrows*" that "*been built up over the past 70 years and is deeply embedded – literally and metaphorically – in the landscape of the Fergana Valley.*" This complex infrastructure was managed – operated and maintained by a hierarchical administration with the Soviet Ministry of Land Reclamation and Water Resources (*minvodkoz*) at the highest level and the regional water resources management departments supporting it. Water management was governed based on a territorial approach rather than along hydraulic or catchment-based principles.

On independence in 1991, Kyrgyzstan undertook several reforms in the agricultural and irrigation sectors. A new Land Code was adopted in 1999, which allows state, communal and individual ownership of land (Lindberg no date). The Land Redistribution Fund, administered first by the Ministry of Land and Water Resources and later by village governments, set aside 25 percent of the *kolkhoz* and *shovkoz* lands to the state and redistributed the remaining 75 percent to previous members of the collective or state farms. The amount of land that was distributed to individuals depended on the number of people living in a village, the size of the farm and the number of years an individual worked on a collective farm. Initially the new farms were medium sized, but, by 2004, due to orientation in agriculture towards small-scale farming, the large number of peasant farms emerged, accounting for nearly the quarter of the country's agricultural lands. Between 1992 and 2002, the number of peasant farms increased from 4 100 to 84 700 (Spoor 2004). The size of landholdings varies between one hectare/person to 0.1 hectare/person. The smallest landholdings are located in the Ferghana Valley, where population is the densest.

As a result of the location of parts of the waste irrigation system in many countries (and hence administrative regions) and the diversification of crops, the three countries that occupy the valley now have to cope with sharing the water across border and allocating water in country among myriads of small producers and subsistence farmers. However, the physical structure of the irrigation network, its dimension and sheer size, limits the options for alternatives and it is proving ill equipped to adapt to increasing crop diversity.

Others add that the design and state of I&D infrastructure represent further obstacles to satisfying growing demands. An irrigation management system that was designed to deliver water to monocropping, cotton-growing collective farms must now satisfy the needs of hundreds of individual farmers with the freedom to cultivate the crops of their choice. Thurman (2003) writes that the I&D infrastructure that the newly independent states inherited was already in a poor condition during the late years of the Soviet Union. Since independence, due to the reduction in state funding “to almost nothing” (Johnson III, Stoutjesdijk and Djailobayev 2002) and to the lack of capacity of the farmers to invest in infrastructure, the state of infrastructure has continued to deteriorate. As a result, significantly less water reaches the farms today than in the years of Soviet management.

4.2 Institutional transformations in irrigation management

Before the Tsarist era, the *murab*, or the “water controller”, managed the distribution of water on the local scale. He was overseen by the village elder chosen by the community. In the highest levels of government, the chief *murab* was responsible for water allocation and distribution. All users were required to take part in the maintenance of canals, and they were also expected to pay for the water they used. Local-level management institutions were strong and well adapted to their environments; each settlement had its rules as to who has access to and control over the resource (O’Hara 1998).

Collectivization meant the eradication of traditional forms of farming. While the Tsarist system integrated traditional institutions and organisations in its own system (Bischel 2006), the Soviet administration believed that full productivity could not be achieved until

the inhabitants of Central Asia had dropped their old traditions and adopted new ones⁷ (Wheeler 1955). Therefore, the Soviet administration took water management “*out of the hands of traditional elders and councils with whom it resided*” (O’Hara 2000: p.430), placing it under the authority of the Ministry of Amelioration and Water Resources, founded in 1928.

Some the traditional institutions, such as the Elders’ Council and the *ashar*, persisted and functioned in parallel to the Soviet administration. The Elders’ Council is made up almost always of men and from the older generation. The most significant role of the Elders’ Council was dispute resolution within and between communities. They are also authorized to represent the interest and speak for the community. *Ashar* is a traditional form of cooperation where “*groups of people are mobilized to assist construction and maintenance tasks of a collectivity*” (Bischel 2006: p.108). It lost its voluntary character when it became obligatory collective labour (Russ. *subbotnik*) under the Soviet administration. While *ashar* is helpful in mobilizing communities for collective action, there is evidence that it in itself is not a democratic practice. Traditionally, *ashar* is called by the local *ayil okmotu* and it decides when, where and how the collective work will take place (Giffen no date).

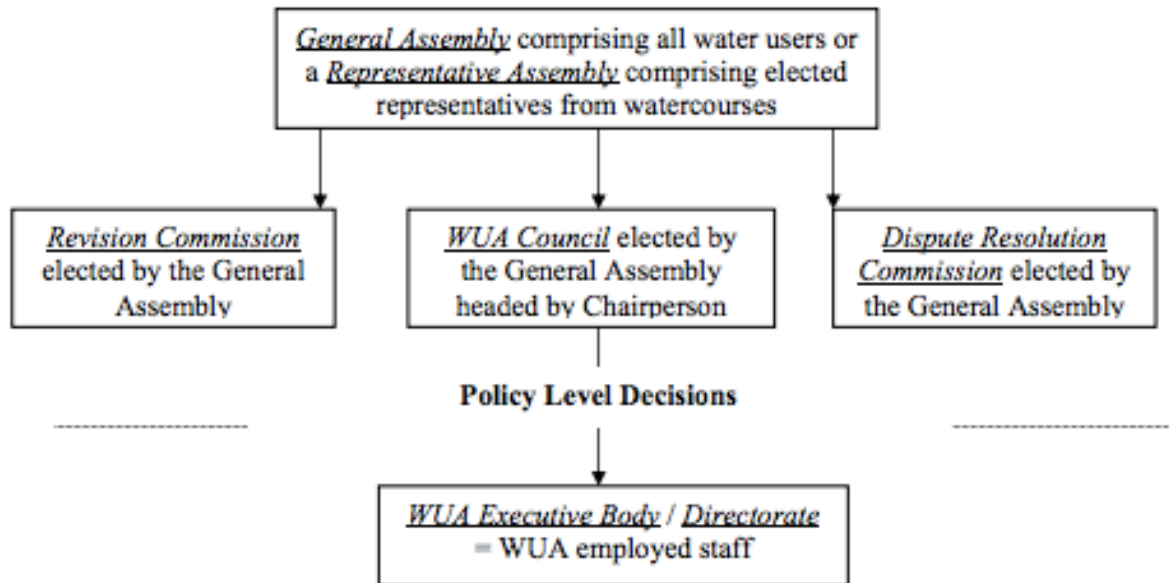
In 2002, shortly after independence, Parliament adopted the “Law of the Kyrgyz Republic on Unions (Associations) of Water Users #38” (the “Law”) and formalized WUAs. Through the Law, it established communal ownership regime of the I&D systems and gave formal rights to manage the resource to members of WUAs. The Law defines a WUA as “*a non-commercial organisation that acts in the public interest for the purpose of operating and maintaining a specific irrigation system so as to provide the owners and users of agricultural land with irrigation water*” (Law of the Kyrgyz Republic on Unions (Associations) of Water Users #38: 2002). The tasks of the WUA are the operation and maintenance (rehabilitation and improvement) of the irrigation infrastructure and water

⁷ According to Wheeler (1955) this notion is an essential feature of Marxism, “but it has particular force when applied to a people whose culture is largely Islamic, for the Russians believe that Islam is far less compatible with modern methods than Christendom”.

distribution (Law of the Kyrgyz Republic on Unions (Associations) of Water Users #38: 2002).

The organisational structure of a typical WUA is shown in Figure 3.

Figure 3 WUA organisational structure



Source: IWMI and SIC ICWC 2003

The Law of the Kyrgyz Republic on Unions (Associations) of Water Users (2002) guarantees the following rights to the Bek Abad Suu WUA:

- the right to distribute water;
- the right to operate and maintain the infrastructure within the WUA service area;
- the right to rehabilitate and improve irrigation systems within the WUA service area and undertake construction work as necessary;
- the right to purchase water for distribution within the service area.

Other rights are the right to mobilize financial resources in the form of water fees (or water duties – to determine rates to cover fees determined by the water suppliers and

fees needed to cover O&M and to collect the fees), to impose fines and sanctions on those who do not abide by its rules and regulations and to exclude members.

The members of WUAs are those “entities” that own agricultural land in the service area of a certain WUA. “Entities” who lease agricultural land may also become members of a WUA, but only on the condition that they hold a lease the length of which is more than three years, and obtain the written permission of the landowner to become a member. Members pay water duty to the WUA. This income is paid as salary to the employees of the WUA and invested in the maintenance of the irrigation infrastructure on the level of the distributary canal.

According to the Law, and in theory, WUAs are democratic grass-root organisations. Members have rights to full participation in the establishment and operation of the WUA and to participate in the decision-making processes. They are to receive free information pertaining to the management of the irrigation system. Moreover, according to the Law, members are ensured “*faire and equitable distribution of irrigation water*” as well as environmental security (Law of the Kyrgyz Republic on Unions (Associations) of Water Users #38: 2002). In addition, through membership in the WUA, farmers may gain the following benefits:

- equitable water distribution among farmers regardless of their location, type of farm, or size of the farm;
- more reliable water supply;
- water supply becomes more responsive to crop needs;
- quick dispute resolution at the local level;
- well-maintained canals;
- more control over water theft/ stealing (IWMI and SIC ICWC 2003).

Chapter 5 Results, analysis and interpretation

For most households that inhabit the research area and, indeed the larger Ferghana Valley, access to irrigation water is vital. In the semi-arid region in which the study area is located, farming, on which most of the habitants rely to some degree for their livelihoods, is only possible with the use of irrigation water. In Chapter 5, I discuss contemporary rural livelihoods in the research area and the importance of farming as one of the strategies for making a living. The research focuses on irrigation water management on *ülüs* and *arenda* lands. An analysis of the impacts of land redistribution in the villages is presented as well as the land and water access that were created. Next, an analysis and interpretation of the data on irrigation water management by formal and informal institution is undertaken.

5.1 Rural livelihoods and household economics

Sixty-three percent of the population in the Kyrgyz republic lives in rural areas in relative poverty. The southern regions of Kyrgyzstan, including the research location has the highest density of rural population. Due to the economic downturn and the collapse of the industrial sector since independence, poverty has grown significantly, especially in rural areas. According to the country's Poverty Reduction Strategy Paper (Government of the Kyrgyz Republic 2002), in 2001, 51 percent of the population was considered poor and, of that, 15,6 percent extremely poor.

Rural households⁸ adjusted to the political and economic changes that accompanied independence by diversifying their livelihoods activities. In addition to jobs in the public sector, business, economic migration has become an important contributor to household

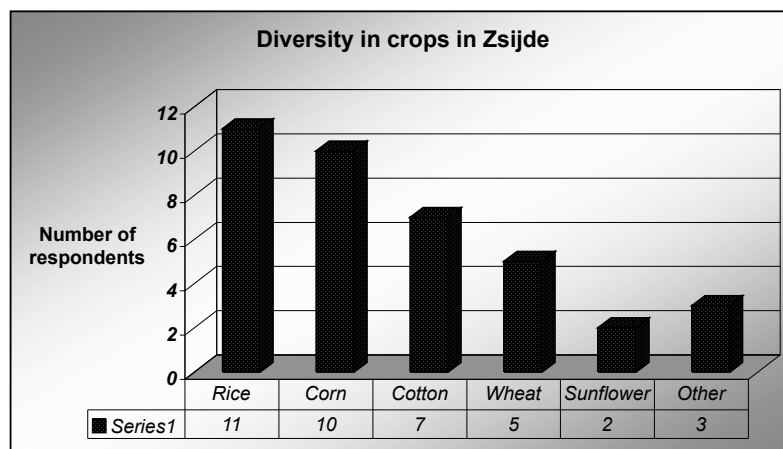
⁸ According to Kandiyoti (1999), the definition of a household must always be adjusted to local circumstances. In the case, household includes various generations - parents, children, including married, daughter-in-laws and grandchildren living together in the same household. Girls, when they get married, move to their husband's family. While girls leave the parental household, boys, usually the youngest, looks after the parents in their old age. Daughter-in-laws may also contribute to the household income by working as teachers or nurses and in the fields.

economies. Sending a male member of the family to work in construction and mining in Russia can contribute as much as \$100 per month on average (Laruelle 2007) to the family budget, although often the earnings are saved up by young adults to build a house or pay for wedding and only a part of the remittances is contributed to household spendings. Laruelle (2007) writes that of the 300 000 migrants that the Kyrgyz government officially recognized, 90 percent are from southern regions, including the Jalal-Abad oblast, that was particularly hard-hit during the post-Soviet changes.

In many households with access to land, agriculture has become a subsistence activity to complement income-generating activities. Much of what is grown is used within the household as safety net. For example, despite the low market value of the cotton, almost everyone in my sample cultivates some. Cotton is not only a cash crop but also a subsistence crop. It is used for oil, for carpet-making and provides material for heating and cooking. Rice, due to its high value in the market, constitutes a safety net for families: if they can afford it, families will store the rice until the winter. In the winter, when a household is in need for money and rice is in short supply, the families will raise funds by selling their rice in the market.

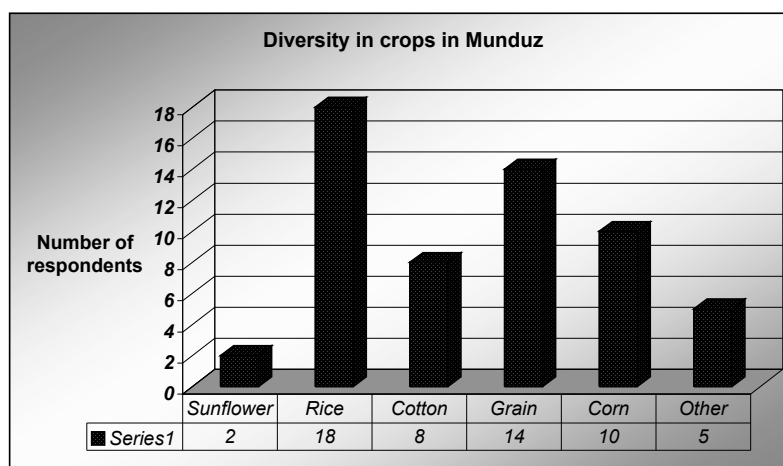
While during the Soviet period the state determined the types and amount of crops grown on collective farms. The state no longer determines how much of each crop a farmer should or must grow nor does the WUA advise farmers regarding the choice of crops in order to ensure the sustainability of water supply in the region. Instead, each farmer is able to decide what kind of crops he/she will grow and on how many hectares or *sotiks*. At the research location, the main crops are rice, cotton, corn and grains. In backyard or kitchen gardens, people grow vegetables and have small orchards. Figures 4 and 5 show the crops most commonly grown in the two research communities.

Figure 4 Diversity in crops in Zsijde



Source: Author's interviews (2008).

Figure 5 Diversity in crops in Munduz



Source: Author's interviews (2008).

In terms of division of labour within the households, men are, in general, responsible for physically demanding work, including irrigation, and women usually do the weeding. The head of household is responsible for looking after water and for constructing canals (important especially for rice). Rice, the most valuable crop on the market, is mainly looked after by men, because it needs constant watering and building of basins that retain water, which is considered hard physical work. A notable exception is the still functioning

Shirin cooperative farm located within the research area, where women organize the irrigation of 1.5 hectares of rice. Widows and their sons also organize irrigation on their lands. As the children grow up, they receive responsibilities for certain jobs in the household. Young boys look after the cows and watch the water in the field, while girls will weed, cook and clean. As older youth, especially young men, increasingly migrate to Russia, girls and the elderly tend to look after the crops.

Beside small landowners, there are a few big landowners to whom farming is less a survival strategy and more an economic opportunity. Agricultural entrepreneurs purchase land use rights from those who do not or cannot cultivate their lands. Entrepreneurs look for and purchase quality lands determined by the quality of the soil and by the availability and proximity of a reliable water supply. While some entrepreneurs only grow rice, others will diversify into various fruits and vegetables, which they sell in nearby markets and as far as Bishkek.

Nizamendinkhodjayeva (no date) looked into the importance of irrigation water for livelihoods in the rural regions of Kyrgyzstan, Uzbekistan and Tajikistan. According to her, access to irrigation water is an essential resource to meet the subsistence needs of the rural population, in particular of the rural poor. Irrigation water is an essential input in activities such as crop growing, poultry farming and livestock rearing. Due to increasing poverty, there has been a change in agricultural production to food crops, leading to higher water demands (Wegerich 2001). Other important but non-farming livelihood activities, such as brick-making, box-making, baking and selling bread indirectly depend on access to water. At the same time, due to the inability of farmers' organisations to maintain the irrigation and drainage systems, about 260 000 ha of irrigated land has been abandoned in Kyrgyzstan (Dukhovny 2007) and many farmers experience irrigation water shortages.

5.2 Household access to land and irrigation water

The contribution irrigated agriculture makes to the household economy depends on the amount of land the households have access to. Access is in the form of ownership and

rent. The size of the lands that people received was determined based on the amount of land available in a certain area and on the density of the population. In Zsijde and Munduz, each habitant received 14 sotiks of land. These rather small sections of smallholders' lands (Kyrg. *ülüs*) are usually pooled together by the extended family, which means that each family in Zsijde and Munduz owns approximately one hectare of land. Figure 6 shows that the size of the bulk of the land (*ülüs*, *arenda* and *ogorod*) that the interviewees own is between one and five hectares.

Figure 6 Size of lands owned by the interlocutors in Zsijde and Munduz

<i>Under 1 ha</i>	<i>Between 1 and 5 ha</i>	<i>Over 5 ha</i>
2	28	5

The government also set aside 25 percent of the *ex-kolkhoz* and *ex-shovkhoz* lands as *arenda* land. In addition, each family owns a small kitchen garden that is usually located next to the house and where vegetables are grown and fruit trees are found. Various modes of farming are practiced, including individual peasant farms, family farms, cooperatives, joint stock companies and kitchen gardening (Johnson III, Stoutjesdijk and Djailobayev 2002).

The location of the land relative to the canal and water access point determines whether the land is arable and the kind of crops that are possible to grow on it. Although the land redistribution appeared to most of the interviewees as fair, upon inquiring about it further, it created its "better-offs" and "worst-offs" in terms of the ownership status, size, quality and location of the land. The perception among farmers whom I interviewed is that land redistribution in 1996 was fair; most people were informed of their rights and responsibilities and they all received equal amounts of lands. However, it is clear from the interviews that some, who were better informed about the process, claimed lands for themselves and their relatives earlier than most farmers could and were also able to choose the location of their land. This was the case with an interviewee, who, when asked about the land redistribution, said that he received 15 hectares of *ülüs* land for himself (his family) and his relatives in 1995. Having known about the shortage of water, he chose lands that are located near the canal. He then divided the land among his relatives. It is

most likely that inequalities were facilitated by the fact that changes from the collective system to individual land ownership took years to complete, giving occasion for obtaining privileges by well-placed people and by the fact that not everyone was equally well informed about the land redistribution process.

The unequal land redistribution reinforced the positions of the rural elite. In my research, an *aksakal*, who previously occupied a high position in the Soviet apparatus and, to a lesser extent, an oblast-level irrigation official, both gained privileges during the land redistribution that established their superior position vis-à-vis other farmers in terms of land ownership and water access. One of them, due to the privileges that his previous position offered him, was not only able to purchase extensive lands, but a tractor and an underground water system, through which he can provide water not only to his 10 ha but also to villagers whose lands suffer from water shortages from surface canals.

5.3 Contemporary institutional context: the emergence of formal and informal institutions

In any irrigation system, parallel to the physical network, a network of social actors plays the management role. This social network includes everyone from those that divide the water at the head of the system to the field level users. Along the Zsijde-Munduz canal, the Bek Abad Suu WUA manages the irrigation water and the associated infrastructure. Within its territory, a number of informal institutions also play a part in irrigation water management. In this section of the study, I discuss the structure, rules and activities of the Bek Abad Suu Water Users Association (“Bek Abad Suu WUA”), the only formal organisation that is responsible for irrigation water management in the research territory. Next, I explore those institutions that are informal in nature as well as those that are spontaneous and look at what roles they fill in the management of irrigation water. Through the exploration of institutions, I also determine the activities that support most cooperation between farmers and the emergence of collective action.

5.3.1 Bek Abad Suu WUA: organisational structure and responsibilities

Before 1959, two *kolkhoz*, Erkin and Pravda, existed in the area of the present Bek Abad Suu WUA. In 1959, the two *kolkhoz* united to form the Erkin *kolkhoz*, the total area of which was 4 006 hectares and its irrigated area 1 826 hectares. The population of the *kolkhoz* was 8 000 and the members of the farm numbered 3 500. The *kolkhoz* grew cotton, tobacco, potatoes, vegetables, grain and corn. Production and cultivation was organised in 19 brigades, of which 15 were responsible for cotton cultivation and four looked after livestock.⁹

The present irrigation system was built during *kolkhoz* times. In 1951 and 52, hydraulic work was carried out on the Kara Darya River, to regulate the flow of the river and reduce the chances of flood. The lined canals were built in 1964. In 1959, the first water association was formed in Bek-Abad, made up of water specialists that planned and executed water distribution. *Murabs* of Erkin, Zsijde and Munduz divided the water to each village.¹⁰

In 1996, during the midst of the restructuring of the agricultural sector, the *kolkhoz* and the *shovkoz* were both abolished and the agricultural lands that once belonged to them were redistributed to individual farmers. The redistribution created three land categories: *ülüs* lands were given to everyone (including children) alive at that time and live in the village. The size of the *ülüs* was determined based on the amount of arable land and population numbers in each village. The farmers kept the *ogorod* lands that are attached to their houses. The government also set aside some lands (Russ. *arenda*) that may be rented.

The Bek Abad Suu WUA was established on January 25, 2001, following the closure of the Erkin *kolkhoz* in 1992. Its location relative to the Andijan Reservoir, to the canals and to neighbouring WUAs is shown on Map 2. The area of the WUA covers 3 260 hectares, 2

⁹ Author's interview with the ex-Chairman of the *kolkhoz*, May, 2008.

¹⁰ Author's interview with the ex-Chairman of the *kolkhoz*, May, 2008.

400 independent farmers and 17 cooperatives in five villages: Ücsköcsö-Zsijde, Bek-Abad, Erkin, Munduz and Jani-Jer.

The source of the water to the Bek Abad Suu WUA is the Kara Darya off-farm canal of the Kara Daria River system. The Bek Abad Suu WUA service area and its location relative to the waterbodies of the region is shown on Map 3. The number of WUA members is 2412. The main crops are wheat, corn, rice, cotton, sunflower and vegetables. The WUA has 10 off-farm canals of 51,95 km in total.

Within the Bek Abad Suu WUA, the Board (or WUA Council) consists of 11 members elected by the representative assembly. The Chairman of WUA Board is not paid by WUA and works on voluntary basis. WUA management consists of the Director, Accountant, O & M Engineer, cleaner, guard and seven ditch riders¹¹. The Bek Abad Suu WUA employs four murabs (each being responsible for a community) also.

There are two committees within the association: the Revision Committee (or Revision Commission) and the Conflict Committee (or Dispute Resolution Commission). The Revision Committee consists of three members elected at the meeting of WUA representative assembly for three years. The Revision Committee is responsible for inspection of accounting records, assets, material & technical reserves and bank accounts at least once a year. The Conflict Committee consists of five members elected for three years from amongst the respected people whose opinion can influence opinions of other WUA members. On the basis of the result of annual operation the WUA representative assembly decides to keep the members of both committees for the next term or replace by other WUA member.

The *Law of the Kyrgyz Republic on Unions (Associations) of Water Users* (2002) stipulates that activities of the WUA should be based on such principles as participative

¹¹ Ditch riders patrol and inspect irrigation systems and distribute water. Murabs fill the same responsibilities.

management, fair and democratic decision-making and transparency in management and the organisational structure of the WUA provides for the participation of farmers in the decision-making processes. The WUA Specialist of the *ObVodKhoz* described the organisational structure as follows:

They organisation adopted a new organisational structure based on the experience of the World Bank. The organisational structure has changed from an up to down to a bottom-up structure. Before, one person, the Chairman of the kolkhoz, made the decisions. The farmers, at the bottom of the structure, acted according to the decisions by the Chairman. Now the decisions are made collectively. On the top of the structure is the general meeting (farmers), the Chairman of the Council and on the bottom is the technical team. The Chairman of the Council (seven members) are tasked with collecting water fees, selecting the arbitration committee and also controlling the services provided by the technical staff. The technical team undertakes maintenance.¹²

¹² Author's interview with the Water User Specialist of the *ObVodKhoz*, July, 2008.

Figure 7 **Distribution infrastructure at the head of the system**



Source: Author (Summer 2008).

Farmers become members of the association by signing a contract with the Bek Abad Suu WUA and, by law, each member of the family, under whose name a piece of land is registered is also its member.¹³ In exchange for payments, in money or in kind, from farmers, the WUA distributes water and maintains the infrastructure. The WUA's responsibility consists also of acquiring water from the supplier (a government agency) and managing water distribution along the Zsijde-Mazar distributary canal and between

¹³ According to the Law of the Kyrgyz Republic "on Unions (Associations) of Water Users", "Physical or legal entity that owns a plot of agricultural land situated within the Service area of a WUA or has use right for this plot of agricultural land for the term more than three years can be a member of WUA." In theory, this means that each person who received *ülüs* land is a member of the WUA, by law, if the land is registered under his or her name.

networks of tertiary canals. It is also responsible for repair and maintenance on the secondary and tertiary levels. Farmers manage distribution, repair and maintenance within field-level canals.

5.3.2 Irrigation water management under the Bek Abad Suu WUA

5.3.2.1 Water delivery and distribution

The accuracy, timeliness and effectiveness depends on the availability of water, the demand of various users, the capacities of the canals and the capacity to measure flow and distribute water according to the demand of the users and on the capacity of the operators. For an irrigation system to work efficiently, two things are needed: functioning, accurate and reliable physical structures in which gate settings can be adjusted; and a team of well-trained operators (Bosch *et al.* 1993).

Among the responsibilities of the WUA is the timely delivery of water to members. To distribute water on the tertiary level, four *murabs* meet each morning at the head of the system to divide the water among the villages. Later on each allocates water among the *aryks*. Within each *aryk*, the farmers are responsible for allocating the water by organising taking turns in irrigating their fields.

The allocation of water in the field runs into difficulties. Due to the dilapidated state of the infrastructure except perhaps for the conveyance system, also called headworks (Figure 7), and a lack of water flow measurement tools, water cannot be accurately divided among the tertiary canals. In many places along the system the control gates are missing. Each year the WUA repairs the gates, but each year they are broken to make the abstraction of water by farmers easier.¹⁴ This simple fact makes the control of water flow difficult at best, but mostly impossible. When asked about the division of water among

¹⁴ Author's interview with Chairman of WUA and with WUA Engineer, May, 2008.

the villages, the *murab* responded “we divide the water with our eyes”.¹⁵ This response suggests little ability to control water flow and distribution beyond the headworks.

The *murab* is responsible for irrigation water management among and in the communities and within the *aryks*. The *murab*'s is an ancient position that has been recuperated and incorporated in the new institutional framework. The position carries with it responsibilities such as the scheduling and distribution of water among the *aryks* and collecting water duty. The *murab* is the employee of the WUAs and is therefore answerable to the WUA management and the users. The *murab* is in contact with the farmers each day and is aware of the water needs of the community that he is responsible for. Because of his daily contact with people, he has the ability to inspire adherence to rules and collaboration among farmers in sharing irrigation water.

In the study area, the *murab* is not respected among the people. As a result of the large number of farms that the WUA is responsible for, the limited means of the organisation and the problems with the infrastructure, close and effective control over distribution on the level of the farmers is impossible. Additionally, the *murab* receives very little salary. The position frequently changes hands¹⁶ and is periodically left vacant, as was the situation in Munduz at the time of the research. Finding a *murab* is further complicated by some cultural factors. Ideally, the *murab* must hold respect among farmers in an essentially traditional environment. He or she must show qualities such as a certain age (maturity), endurance and respectability. In the words of an interviewee:

The *murabs* cannot [...] have no time to oversee the distribution of water. There are many farmers you see, every family is a farmer. [...] All the *murabs* are young [...] older man cannot walk up and down along the canal. That is why the older farmers do not listen to the *murab*. They say: « you are young,

¹⁵ Author's interview with the Chief *murab* in May, 2008.

¹⁶ Author's interview with the Water User Specialist of the *OlbVodKhoz*, July, 2008.

I shall open the water ». And the *murab* does not say anything, because his [the farmer's] age is his father's age.¹⁷

The WUA lacks certain basic resources to distribute water according to a plan and to the needs of the users. Infrastructure is lacking intake structures and gates to be able to control water flow. There are technological lacks to measure water levels and calculate water flow at various points of the canals. From the point of view of institutions and organizations, the WUA is lacking competent operators who are able to monitor distribution, the duration of irrigation by individual farmers and hold the authority vis-a-vis the users to settle any breach.

The majority of interviewees reported seasonal irrigation water shortages. Seven of the eight farmers who do not experience water shortages are upstream farmers (i.e. closest to the head of the canal). Among the interviewees, 27, who were the most affected by the periodic water shortages, lived downstream (their farms were located in a considerable distance from the head of the irrigation system). Therefore, the geographic location of each land in the irrigation system determined whether farmers would have sufficient water or not. This situation is also played out on the larger-scale. While Zsijde is seen as not having a water problem (despite the fact some, especially downstream, do experience water shortages) Mangut, a street located between Zsijde, Munduz and Hodjo-Muskui (another sector of Zsijde that is situated downstream relative to Zsijde) all do. An Elder (Kyrg. *aksakal*) explained well the differences in the attitudes of villagers toward water created by the access (or its lack):

My neighbours in the Zsijde village are very lazy, because there is no problem for them with the water. They go in the morning and open the canal as they like, but in Munduz every night 5 to 10 men go to guard the water.¹⁸

Several factors contribute to irrigation water shortages. Irrigation water shortage is due to fluctuations in the climate and to a dilapidated irrigation infrastructure. Cold winters in

¹⁷ Author's interview with resident of Munduz, June, 2008.

¹⁸ Author's interview with resident of Zsijde, June, 2008.

2007 and 2008 resulted in a situation where the extensive use of hydropower for heating resulted in very low levels of waters in the Syr Darya for the irrigation season (Libert 2008). The representative of the Bek Abad Suu WUA confirmed that in 2008, one third of the amount of irrigation water was available compared to other years.¹⁹ Due to the dilapidated irrigation infrastructure, there is also much loss of water in the system. Officially, about 20 per cent of the water that is allocated through the main canal is lost due to evaporation and leakage, but some interlocutors, including irrigation officials, estimate this number to be much higher.

On the demand side, some interlocutors, farmers as well as professionals, are of the opinion that the increased cultivation of rice in the area is causing water shortages. Since the introduction of rice cultivation on 350 hectares in 1990²⁰, cultivation expanded to 490 hectares in 2006 and to 560 hectares in 2007. According to figures 4 and 5, the most commonly grown crop is rice. However, as the following interview segment with the Head of Water Unit of the *RayVodKhoz* demonstrate the difficulties in determining the accurate number of hectares on which rice is cultivated and that the total hectare of rice grown is likely to be higher than the numbers published by the *RayVodKhoz*:

After the independence, the farmers put crops as they wished. People say that they grow a number of hectares of rice but, in reality, they will plant more. In the whole Suzak there is 1 700 hectares of rice, but in reality there are more than 2 000 hectares of rice. People lie. They put rice on one hectare, but they say that they planted 50 or 20 *sotiks*. People want to pay less money.²¹

Rice is a water intensive crop, needing seven times as much water as grain and four times as much as corn. While these latter crops require irrigation several times per year, rice needs to be cultivated *in water*, and cannot survive extended periods without irrigation.

¹⁹ Author's interview in May 2008, with the Bek-Abad Suu WUA's Engineer.

²⁰ Author's interview with the ex-Chairman of the *kolkhoz*, May, 2008.

²¹ Author's interview with the Head of Water Unit, *RaiVodKhoz*, July, 2008.

Because it needs such large amounts of water, the preparation for the rice-plots by all the farmers before the planting stage in the spring creates periodic water scarcities. Although, when asked, the Chief *murab* said that the reason for water shortage is the bad state of tastructure, he did admit that the rice-growing was the cause of periodic bottlenecks:

After the repairing of canal there is little problem. When rice and cotton are being grown, people ask for much water. After the rice growing, there is little demand for water.²²

The fact that members of the WUA do not give real information of the amount of crops they grow, the WUA is unable to gain and provide to the government agencies a realistic picture of the water needs. It also has budgetary consequences. Farmers under-report the amount of crops and pay less for water to the WUA.

5.3.2.2 Dispute resolution

The inefficiencies of the physical infrastructure and the lack of management and supervision by the *murab* below the level of the *aryk* and on the level of individual farmer create a situation where quarrels and fights over water are frequent and free-riding frequently occurs. I observed many times users standing guard at the abstraction point (the point where water can be taken from the canal) in Zsijde (for Munduz and Hodjo Muskui) and manipulating the flow of the water with a stone. There are arguments and usually the older or stronger wins. An interviewee demonstrated how, in order to water his land, he makes holes in the lined canal to be able to abstract water at night. In another case, a farmer, owner of several hectares, admitted not paying to the WUA for the water that he uses from the irrigation system.

The structure and regulations of the WUA provide for dispute resolution and punishment for free-riding and stealing water. According to the regulations of the WUA, an arbitration committee, made up of five people that are chosen by the members of the WUA, resolves any disputes. These are *aksakals*, one from each village. If they are not available, the

²² Author's interview with the Chief *murab* in May, 2008.

chief of the WUA becomes the decision-maker.²³ Punishment is given for damaging infrastructure such as breaking the canals or making holes in their walls. Those who commit offences may receive a monetary punishment²⁴ or the WUA has the right to withhold water between three and ten days²⁵. Despite the existence of these measures, it is very difficult to enforce them. The reason for the institutional weakness of the WUA is that it lacks the financial capacities to hire enough personnel. As I was told:

Disputes over water and breaches are hardly ever reported to the WUA. One of the reasons concern the definition of stealing and how various actors within the system conceive of it. As the following citation shows, free-riding is not necessarily perceived as stealing:

“I do not think that it is stealing. Stealing is when I have my own water and somebody takes it without my permission. The water is a common. All of them may use the water.”²⁶

The above quotation highlights the issues around the definitions of water rights and access. While for the WUA leaders, rights of access are associated with membership in and payments for water, for the users the right to access irrigation water is strongly associated with land rights but it is dissociated from being a member of the WUA. In fact, most farmers believe that water is a free and common resource. The following conversation demonstrates well this attitude:

Who has the right to use irrigation water? Everybody has the right to use irrigation water. Even those who do not pay? Yes. You see the use of the water is free of charge. The people will pay money for the WUA to repair the

²³ Author's interview with Chairman of WUA and with WUA Engineer, May, 2008.

²⁴ Author's interview with WUA Engineer, May, 2008.

²⁵ Author's interview with Chairman of WUA, May, 2008.

²⁶ Author's interview with resident of Munduz, June, 2008.

canals. [...] In the Kyrgyz law it is said that water is free. For example, this year I may not pay the money for water, because there were no repairs.²⁷

A similar situation arises with respect to the arbitration committee and the WUAs punishment mechanisms. Interviewees were not aware of them and they tended not to report problems regarding stealing and free-riding to the WUA. If there was an attempt to resolve a dispute, users preferred to do so between themselves and to save face. They relied on such social sanctions as shaming rather than turning to formal institutions such as the arbitration committee. In the words of the Chief *murab*:

The law foresees the punishment of people who steal water. But in the community all the people who steal water are acquaintances. Therefore, the law is not applied. I shame people who steal water.²⁸

Clearly, even if the WUA foresees a water schedule and the member farmers are expected to comply, these schedules, in most cases, cannot and aren't enforced by the WUA with user farmers. In the case of the study area, free-riding is a "rule", an institution in itself. In addition, while in a formal organization, such as the WUA, punishment is expressed in fines, in a closely knit community punishment would be expressed in "shaming".

5.3.3 Informal institutions

There is an institutional vacuum between the administration of the WUA and the tertiary canals and the farmers' fields. The vacuum is filled with informal institutions and spontaneous cooperation that mostly arise in response to water scarcity. Examples of cooperation exist in the form of organizing distribution and monitoring of water within farmers along an *aryk*. Especially during peak irrigation season when water shortages are experienced, farmers in an *aryk* agree to 'take turns'. This kind of cooperation works well within the framework of the WUA as the farmers are responsible for scheduling irrigation in the fields. However, in some cases, when they feel that others threaten their supply of

²⁷ Author's interview with resident of Munduz, June, 2008.

²⁸ Author's interview with Chairman of WUA, May, 2008.

water, they monitor the water together at the tertiary canal, which is under the murab's supervision. The situation of the farmers of Hodzso-Muskui, a part of Zsijde, is a good example of such informal collective action. Hodzso-Muskui, competes with Munduz for water. As a result of water shortages, farmers show more willingness than other groups of farmers in further upstream in the study area to invest time and manpower and act collectively to abstract and guard water. One interlocutor explained the management of irrigation among the farmers as follows:

We use water in turn. We start taking water at night and we will take it for two days. [Who decided that you could take water?] We decide ourselves. There is no *murab*. [...] We guard the water, two men at the beginning [at the abstraction point], two men in the middle and two men at the end. We guard it at the lined canal. We agree to guard the water from Zsijde's villagers.²⁹

While taking turn among the farmers in *aryks* frequently happens, guarding the water in such an organized manner is more of an exception than a rule. Usually, people will guard their water individually, spending much time monitoring the abstraction point as well as their field.

Ashar has been an institution of collective action for long a long time. It is a pre-Soviet Central Asian custom, probably of Uzbek origin, and the Kyrgyz strongly identify with it. In the framework of the *ashar*, community members are called together to build houses, harvest crops and undertake charity work (helping widows for example). During the Soviet period, paid work replaced *ashar* in the fields. Nonetheless, people continued to practice the custom outside the *kolkhoz*, mainly in houses construction. In some cases, in the Soviet era *kolkhoz*, workers were required to work on the repair and maintenance of the canal. Participation was paid and it was obligatory: the Chairman of the *kolkhoz* punished whoever did not participate in the *ashar*³⁰.

²⁹ Author's interview with resident of Munduz, June, 2008.

³⁰ Author's interview with habitant of Zsijde, May, 2008.

Today, *ashar* is frequently used in repair and maintenance of the irrigation infrastructure. Both the concrete canal and the field-level canals are repaired using *ashar*. The WUA maintains the concrete canal. The head of the local government and the Chair of the association determine what repairs will take place, where and when. To undertake the yearly rehabilitation of main canals, in addition to the WUA's employees, it requires the labour of some ten farmers. On the field canals, repair is organized among the farmers.³¹

Although *ashar* remains common practice today, it has gone through considerable change, especially since independence. Firstly, while pre-Soviet *ashar* was organized to support families, there is a decrease in family-oriented *ashar* today. Instead, people, or rather families, who need work done, hire workers to do those tasks that used to be accomplished communally. Secondly, people today are less likely to provide their time and labour for others free. Interviewees explained this change to me as follows: *Ashar* used to be (during the Soviet era) a way of life in which "everybody would help everybody"³², (meaning that the whole village was invited). Today, however, the circle of those to be invited to participate in an *ashar* is limited to those that one has good relations with. People invite relatives, friends and neighbours for building houses and for harvests. Some interviewees attributed this to the fact that people are richer now and they exhibit increasingly individualistic behaviours. However, it is more likely that increasingly diversified livelihoods and with outmigration for work, the capacity of a family to participate in *ashar* is somewhat reduced.

Earle *et al.* (no date) writes that while community assistance for single families is becoming rare, 'communal' *ashar*, in which the whole community comes together to undertake the construction or repair of communal infrastructure is becoming more common. Nowhere this is more apparent than in irrigation. In each of the communities that I studied, *ashar* is used to clean and repair the *aryks* each spring, in preparation for the growing season. During Soviet times, the *kolkhoz* would pay workers (the members of brigades) to repair the canals. Farmers, frequently ex-members of the *kolkhoz*, continue

³¹ Author's interview with Chairman of WUA, May, 2008.

³² Author's interview with resident of Jarti Bash, June, 2008.

to undertake this work, free of charge, since the government (through the *kolkhoz*) no longer provides payment for the work.

Interviewees agreed that the impetus to call an *ashar* is not a collective decision of a community of the users. Rather, the leading members of the community, the *ail baschi* or the *aksakals* will mobilize people for the *ashar* and it is their responsibility to distribute the work among the farmers. While it isn't communally generated, people regard *ashar* as their traditional custom and part of their collective identity. Perhaps it is for that reason, once *ashar* is called, everyone I interviewed seems to comply.

Chapter 6 Conclusions

In 1991, the newly independent Kyrgyzstan inherited from the past an irrigation infrastructure that had fallen into despair, limited financial means and professional capabilities and a hierarchical governance system in irrigation that no longer matched the needs of the millions of small landowners. The development path that the government set out on was guided by international policy discourse and donors saw the decentralization of irrigation management and the devolution of responsibilities for irrigation management to the users within the Water User Associations institutional structure.

In the research area, the Bek Abad Suu WUA is the formal organization that is responsible for the management of the irrigation system. Introduced based on a generic model for WUAs, it has a set organizational structure, clearly defined rules and responsibilities and a membership that is made up of the water users in the research area. The WUA holds distribution rights, rights to collect fees for water delivery, to settle disputes and to fine free riders. Success in fulfilling the responsibilities of the WUA means providing water on time and in sufficient quantities over a period of time and at a reasonable cost (from the perspective of the farmer). IMT also implies assuming responsibility for management of the infrastructure, including operation and maintenance, and the participation of the irrigators, specifically in cooperating in tertiary and on-farm irrigation and supporting the Bek Abad Suu WUA in repair and maintenance. Here collective action by the users is essential.

The findings of the study reveal that the Bek Abad Suu WUA is unable to successfully manage supply and distribution. A good example is the fact that accurate data on the number of hectares of rice and other crops do not exist, making it impossible for the WUA to calculate the amount of water needed for the season. It is also unable to plan a cropping calendar that would also provide information to the farmers about the amounts of water that they may expect to receive. Aside from the deteriorated infrastructure the

repair of which the WUA cannot fund - the water fee collected from members does not cover the repair of such complex system – it does not have the human resources to oversee distribution. From the perspective of dispute resolution, it clearly falls outside of boundaries of the traditional culture within which disputes are settled.

The case study also shows that the Bek Abad Suu WUA does not have the capacity to inspire collective action. Users have very limited participation in the work of the WUA and in decision-making. The WUA remains isolated from the users in the everyday practice of irrigation water management. This isolation is most apparent in the way users understand water rights and regulations regarding fines and punishment. The cause may be that, during Soviet time there was very little opportunity for decision-making within the prevailing institutional and organisational frameworks. It may also be that, farmers do not have an incentive to participate in the work of the WUA as they feel that the WUA, due to lack of resources is unable to fulfil its responsibility towards them: to provide a timely, equitable as sufficient water.

The factors that influence the emergence of collective action are numerous. Among the most important are factors are the strong interest in the resource, mutual vulnerability, the presence of social capital, negligible differences in socio-economic conditions and effective local leadership that also have the trust of community members. In the research area, collective action by the members of the WUA is lacking. Farmers lack understanding of their new rights and responsibilities vis-à-vis the WUA and a wish to take part in the management of irrigation water through the new institutional structure that is provided for them. Rather, they mutually experience a water scarcity and need to acquire water. Mostly, collective action, if it happens, it happens outside the formal structures of the WUA, mostly spontaneously and to defend what is regarded by farmers along the various canal as common interest – irrigation water.

Much time has passed since the fieldwork for this research and there are numerous new questions arising about irrigation institutions in the Syr Darya River basin. While this research found evidence of informal groups of farmers acting together to defend their interest, Moss and Hamidov (2016) observes the emergence of more organised WUGs.

One line of enquiry worthwhile pursuing is the evolution of WUAs in the irrigated agriculture landscape of the Ferghana Valley. Another question is whether the groups of users, informally organized at the time of the research, have further evolved into more structured institutions or into other directions. If so, do they fit in the prevailing formal structure of basin institutions and have representation vis-à-vis the WUAs? Do they remain and act at the fringes of formal network? How do their existence and actions influence water management? In this landscape, ideas around boundary spanners and the role of trust are worthwhile topics of further research.

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Electronic resources:

Home Page of AQUASTAT at

<http://www.fao.org/nr/water/aquastat/countries/kyrgyzstan/index.stm>.

Home Page of CAWATERinfo. at

http://www.cawater-info.net/syrdarya/geo_e.htm.

Home Page of GRID-Arendal. at www.grida.no.

Annex A: Interview guide

INTERVIEW GUIDE

Name _____

Gender _____

Personal Information

What is your age?

What is your ethnicity?

What is your religion?

Where were you born?

That is where your mother/father was born?

If answer to question above is « somewhere else »: When did you move here?

Do you live alone?

If no, who else lives in the same house (belongs to the same cooking pot)?

The Land

Do you and your family own/rent agricultural land? Own/Lease/None

How much land do you and your family own/rent and what type of land?

Where are is/are your land(s) located?

How is the land divided within your family?

Since when do you own/rent this land?

How did you receive your land?

How many months per year are you farming?

Which crops and when?

Do you farm alone or together with family or other farmers?

If together with family or other farmers, how do you divide the work on the land (who does what)?

Livelihood Strategies

Do you only work as a farmer or do you have other employment?

Do other members of your family work only as a farmer or do they have other sources of incomes?

Do you market your produce? Which and Where?

Irrigation Water

Do the crops (kitchen or field) require irrigation? Yes/No

Who is responsible for managing irrigation water on your land(s)?

From which canal do you get your water?

During which months of the year do you irrigate?

Which crops?

Do you experience irrigation water shortage? Yes/No

During which months?

What, in your opinion, causes irrigation water shortage?

In the past (during the Soviet period), did you experience water shortage often?

Alternative Water Supply

Do you use other sources of water to irrigate your field than the one available directly from the canal?

De facto water rights

Who has the right to use irrigation water?

How much irrigation water do you have the right to use?

How many soms do you pay per year?

Irrigation Institutions - Distribution

How is distribution organized among farmers who have lands along the canal?

Is there water scarcity this year? Yes/No

How is distribution different during times of scarcity?

Who decides about the distribution of irrigation water?

Do you participate in decision-making about irrigation water distribution?

Why?/Why not?

Do you monitor water distribution? Yes/No If yes, how?

How are the disputes settled? By which person(s) or organisation(s)?

How are people who steal water punished?

Was the system managed differently during Soviet times?

Maintenance Institutions

How are canal repairs organized among farmers who have lands along the canal?

Which person(s) or organisation(s) organizes canal repairs?

Do you participate in deciding when/how to make reparations?

Do you participate in canal repairs?

How are disputes among farmers about maintenance resolved?

By which person(s) or organisation(s)?

How was maintenance organized during Soviet times?

Cooperation

What is *ashar*?

For what purpose is *ashar* organized?

Is *ashar* organized for the reparation of the irrigation system? How is it done?

How often is *ashar* organized?

Who organizes it?

Do you participate in the *ashar*?

Do you participate voluntarily or are you obliged to do so?

Voluntarily/Obliged

Other Institutions

Are you a member of a Water User Association? Yes/No

How does the Water User Association organize irrigation water distribution and the reparations of canals?

How do you participate in the work of the Water User Association?

What other ways exist for organizing together water distribution and canal repairs among farmers?

How did people organize irrigation and drainage maintenance during Soviet times?

Annex B: Consent form

CONSENT FORM

Research Title: Institutions and “Collective Action” in a Transitional Country
Context: Managing Water Resources in the Syr Darya River Basin
Researcher: Blanka Füleki, Graduate Student, Département de Géographie,
Université de Montréal
Director: Thora Martina Herrmann, Professor Adjoint, Département de
Géographie, Université de Montréal
Co-Director: Patricia Martin, Professor Adjoint, Département de Géographie,
Université de Montréal

The following questionnaire is a part of a research project to evaluate the role of collective action in the local level management of an irrigation and drainage system in the Syr Darya River basin in the Ferghana Valley. The research project seeks to (1) understand the importance of irrigated water to local livelihoods in the research area, (2) describe formal and informal institutions through which farmers manage irrigation & drainage systems, and (3) determine which characteristics of the institutions support collective action and which characteristics inhibit its development.

Your participation in this research will consist of responding to certain questions about the way irrigation water and the drainage systems are managed within your community.

Through participating in this research, you will contribute to the understanding of community water management in transitional countries. This project and the methods chosen to collect data does not result in any inconvenience and benefit to you.

Please be aware that your participation is entirely voluntary. You are under no obligation to answer any of the following questions, and may request to withdraw from our study at any point without explaining your withdrawal. If you wish to withdraw from the research or wish to report a complaint related to the research, you may contact the Research Director by phone or email. Her telephone number and email address are indicated below.

This project and the methods chosen to collect data do not result in any personal benefit to you and the only inconvenience is the time required for the interview (an average of an hour to an hour and a half, or longer if you so wish). Upon signing the Consent Form, you will receive a copy of it.

Your responses will remain confidential. Each participant will be given a number and only the researcher will have a list containing the name of the participants and the corresponding numbers. None of the information that would permit your identification will be published. Personal information that would allow any identification will be kept in a locked cabinet and destroyed 7 (seven) years after the end of the project.

CONSENT

I declare that I am aware of the contents of the Consent Form, that I received satisfactory responses to my questions about my participation in the research and that I understand the goal of the research as well as the nature, the advantages and the risks related to my participation in it.

Following consideration, I agree freely to participate in the research. I am aware of my right to withdraw from the study at any point without giving a reason for withdrawal.

Signature: _____

Date:

Name in print (First Name/Family Name): _____

I declare that I explained to the participant the goal of the research, the nature of his/her participation as well as the advantages and the risks related to his/her participation in the research. I answered to his/her questions to the best of my knowledge.

Signature of the Researcher: _____

Date:

You may communicate your questions about the research as well as your decision to withdraw from the research to my translator, [name of translator] at [phone number of translator].

All complaints related to the research can be communicated to the ombudsman of the Université de Montréal, at 1 (514) 343-2100, or by writing to ombudsman@umontreal.ca (The ombudsman accepts collect calls).

