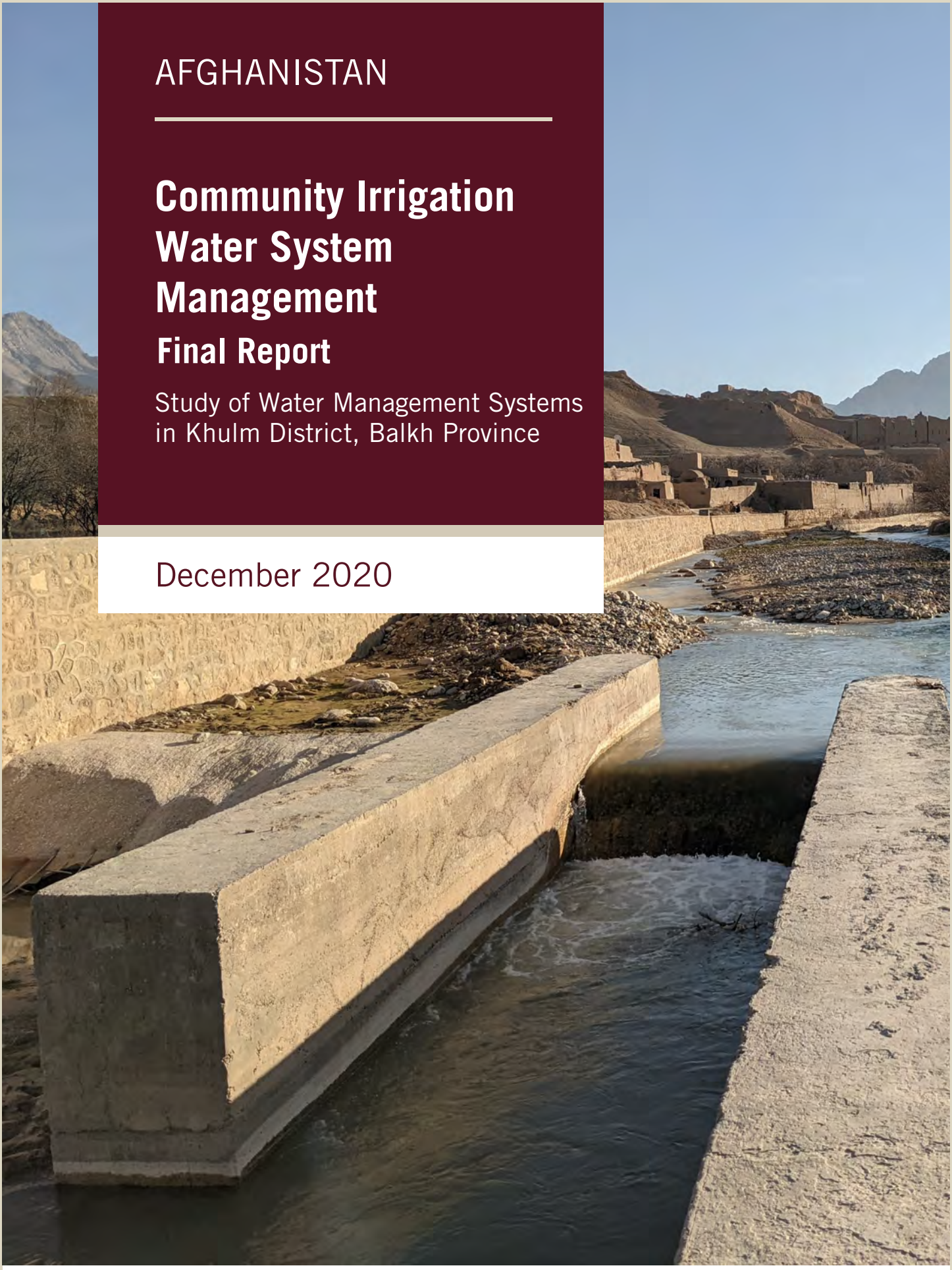
AFGHANISTAN

Community Irrigation Water System Management

Final Report

Study of Water Management Systems in Khulm District, Balkh Province

December 2020



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Cover Photo: Image of the Du-darak in Khulm District, February 2021 © IMPACT Initiatives

Leveraging local capacities
Promoting settlement approaches
Enabling integrated reponse

AGORA, a joint initiative of ACTED and IMPACT Initiatives, was founded in 2016. AGORA promotes efficient, inclusive and integrated local planning, aid response and service delivery in contexts of crisis through applying settlement-based processes and tools.

AGORA enables more efficient and tailored aid responses to support the recovery and stabilization of crisis-affected communities, contributing to meet their humanitarian needs, whilst promoting the re-establishment of local services and supporting local governance actors. AGORA promotes multi-sectoral, settlement-based aid planning and implementation, structured around partnerships between local, national and international stakeholders.

AGORA's core activities include community mapping, multi-sector and area-based assessments, needs prioritisation and planning, as well as support to area-based coordination mechanisms and institutional cooperation.

This baseline exercise represents a key product within a global AGORA program supported by the Norwegian Foreign Ministry, targeting cities in crisis to inform area-based response and recovery plans, and provide support to information management and coordination efforts.

SUMMARY

Context

The people of Afghanistan have been affected by conflict for approximately 40 years, in addition to intermittent incidents of drought, flooding, and other natural disasters over the years. As such, in order to promote development and improvement in livelihoods, public service access, and local community governance, identifying and addressing the root causes of conflict and instability within communities in rural Afghanistan is critical. Most organisations have typically targeted official administrative units, including village, district and provincial governmental bodies. However, many of these units, including local villages, do not conform to the exact boundaries of the people and resources that make up rural Afghan communities, and may not be the best point of entry for engaging with community level issues. Between 2018 and 2019, REACH conducted an in-depth exploration into local community units in the north of Afghanistan, in order to identify the territorial unit through which communal resources were managed, thereby strengthening stakeholder engagement, identifying the local resources available in order to leverage local capacities for development, and subsequently increasing the impact of development programmes. These territorial units are often referred to as manteqas and are often based around shared water resources, particularly for the purposes of farming and irrigation.[1] However, the linkages between manteqas and their contingent resources is not well understood.[2] In order to address this gap, AGORA conducted a research study on water management systems in Khulm District of Balkh province in order to better understand the existing water systems and how they work, as well as to build a deeper understanding of how they relate to communal management of resources in manteqas in northern Afghanistan.

Assessment Methodology

To conduct this research, REACH conducted a detailed secondary data review of the existing literature, as well as primary data collection using both Key Informant Interviews (KIIs) with water managers in Khulm District, as well as Focus Group Discussions (FGDs) with water managers and Water User Association (WUA) members across the entire water management system of Khulm District between November and December 2020. The KIIs also included a participatory mapping component, in which the canals and related water infrastructure were mapped. Khulm District was selected due to its relatively secure location and proximity to Mazar-i-Sharif, where REACH's data analysis teams would be able to support the research if needed.

A research team, led by a Research Manager, conducted KIIs with one water manager of each canal throughout all of Khulm District. At the same time, FGDs were conducted with water managers and members of the Water User Associations between 10 and 22 December. In total, 7 FGDs and 34 KIIs were conducted. Following data collection, the data was transcribed into datasets in Microsoft Excel, after which the KII open-ended questions were standardised toward the most common responses, and then analysed in pivot tables in Excel. The FGD data was analysed in a saturation grid, where the Research Manager analysed the commonalities and differences between the FGD responses, and key findings were highlighted. At the same time, the mapped data was digitised and used to create new maps showing the overall infrastructure and canal network of Khulm District.

The analysed datasets were then compared together, to understand how the qualitative FGD data helped to explain the numbers shown the quantitative KII data. The digitized data was used to produce maps of the area's canal networks and infrastructure, all of which is included in the following report.

[1] Roussel, "Constraints and perspectives in the present context for the elaboration of an immediate rehabilitation strategy of the Afghan rural areas," UNORSA, June 1993.
[2] AGORA, SRDP IV District Water User Group Mapping, December 2019

Key Findings

Water System Management

- The data showed Khulm to have a highly developed water canal system totaling 34 canals, all of which had some form of traditional management. However, the irrigation network was in need of infrastructure support; of the 34 canals in Khulm, only 2 were fully functional, the rest being partially or completely damaged due to flooding or wear from long term degradation.

- Most of the canals were reported by their water managers to be only partially functional, either due to a lack of infrastructure or damage from flooding and erosion. Nearly all of the canals were reported to need new or additional retaining walls, and nearly 75% of canals with existing walls needed to be repaired. Approximately three quarters of canals were reported to either need new gates or abgardans,[3] or have their existing ones repaired.

- Water managers reported that most of the problems were due to the poor quality of infrastructure; only a third of canals had abgardans made of concrete (the remainder are made of soil) and a fourth had gates to control water. The lack of quality infrastructure had reportedly led to loss of water, further worsening the lack of water faced by the community.

Water Allocation Methods

- Despite the establishment of government line departments and empowerment by non-governmental organisations (NGOs) of WUAs specifically dedicated to the maintenance of water systems, nearly all day-to-day responsibilities of water management and maintenance were reported to have been carried out by members of the traditional mirab system, where water managers wer appointed by their communities as a part of a hierarchical system to monitor and manage the output of water from rivers, canals and streams on behalf of the community for agricultural purposes. As a result, any new initiatives by external stakeholders aiming to improve water management should consider the mirab system as the main entry-point for engagement.

- While the mirab system was the primary institution that the community trusted to maintain the water system, most respondents noted that the communities lacked funding to improve the water infrastructure. Financial and material support was often needed from the district government and development agencies in order to make repairs, highlighting the need to improve coordination between the community and external stakeholders.

- Water managers included both official, government recognized members, as well as unofficial members only recognized by the community. Regardless of official recognition, both official and unofficial members worked closely together in a clearly structured system centralized under a central mirab bashi in Khulm.

- This system of water management was supported by a detailed measurement system of square inches that allowed each water manager to control the water for their canal. This water management served as a form of conflict mitigation, allowing each mirab to ensure that each water user received an equal share of water. However, this system of water measurement had not been updated in almost 100 years as the river has changed, and approximately 10 of the water managers, located in upper Khulm, neither measured their water nor were they integrated into the water management system of lower Khulm. Improving accountability and integrating these water managers into the broader water management system will be critical to empowering the mirab system, particularly as a conflict mitigation mechanism.

[3] A weir or intake for a canal.

- Conflict mitigation remained an important aspect of the mirab system. However, the mirab system appeared to have limits as a peacebuilding institution outside of the community; many respondents noted that the biggest water-related issue facing Khulm District was the lack of water coming from the Darya-e Tashqurghan river from Samangan province, which the mirab system in Khulm District had no clear means of resolving. Additional support to local governments and national level actors may be needed to resolve these issues.

Land Management

- While water was managed as a communal resource, it was reported that most land was privately held, mainly through large and medium-sized land-owners who allowed poorer farmers to farm their land as share croppers in exchange for a portion of their harvest.

- While most of the Khulm delta was fertile land, much of the land was still not productive due to a lack of consistent water. This was reportedly due to both the result of water disputes with communities in Samangan Province and a lack of adequate infrastructure to mitigate the loss of water. FGD participants noted that the available water supported less than half of the cultivatable land in Khulm District, greatly limiting overall agricultural output in the district.

- The lack of water was reported as one of the main reasons for many farmers being unable to pay taxes. With the exception of farmers using water from one canal, no farmers were reported to have paid taxes for the past three decades. Outside of a resolution of this issue, the only means of improving water access in Khulm District may be through the expensive infrastructure projects noted above to improve flow and reduce loss of water.

Manteqa Linkages

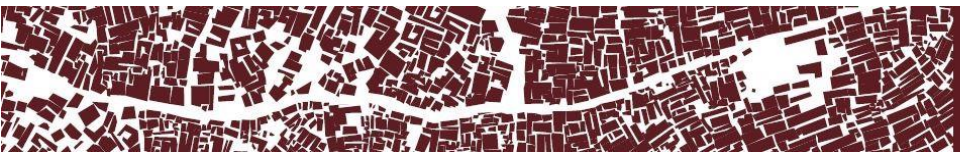
- There was a clear difference between the structure of the water management system in the delta in lower Khulm District, and the water management system in upper Khulm District above the Tangi mountain pass. In lower Khulm District, a complex hierarchy of water managers collectively managed water, while in upper Khulm, water managers did not coordinate or manage their water usage. The differences in these systems underlay a difference in communities, suggesting the existence of two separate manteqas.

Conclusions

Overall, the study found the water system in Khulm District to be deeply embedded in the communities that it served. Despite the growth of the Afghan state at national, provincial, and district level, the vast majority of day to day water management was performed by local water managers, referred to as the mirab system. This system predated the formation of the Afghan state, and involved a complex hierarchy of managers accountable both to each other and the communities they serve, and formed an important conflict mitigation mechanism for agricultural societies in rural Afghanistan. However, because of the relative lack of involvement by government and external stakeholders, these traditional managers often lacked the resources needed to improve and maintain the water system, which has deteriorated due to a lack of infrastructure and flooding damage. External actors did often have the capacities to make these needed changes, and closer coordination between mirabs and external actors could be effective in bringing needed resources towards improving the district water system.

The support of this system is critical, as the research highlighted possible flashpoints for future conflict related to a lack of coordination around water management between the water managers in the delta in lower Khulm, and those above the mountain pass in upper Khulm; many water managers in the delta were concerned about the declining water levels, which water managers up the river were unconcerned with. These water managers reported different selection procedures, management methods, and constituencies; in effect, they belonged to two separate communities, denoting what is likely the division between two different manteqas. This lends credence to the manteqa concept, and supports the need for greater research on other resources and community practices to ensure the robustness of these findings.

CONTENTS



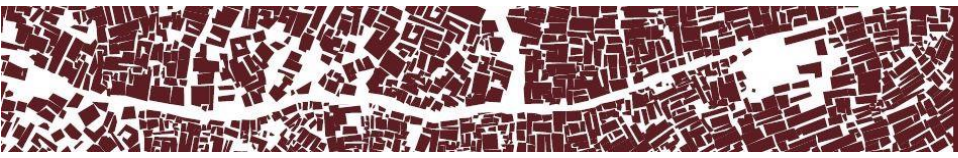
Glossary

Abgardan	Weir or intake for a canal
Ceer	Traditional unit of measurement for weight in Afghanistan, equal to 7 kg
Jerib	Traditional unit of measurement in the Middle East and South-western Africa. In Afghanistan, it is approximately equivalent to 2,000 m^2 or 0.49 acres
Malim	Traditional community teacher in rural Afghan communities
Manteqa	A geographic area linked to a particular community from which community members share common practices and resources.
Mirab bashi, Mirab/Chakbashi	Traditional water managers in rural Afghanistan. A hierarchical structure is employed in which the mirab bashi manages the largest water source, mirabs manage the water that comes from that water source, and chakbashis manage the water sources that come from the mirab's water sources.
Mullah	Muslim religious leader trained in Islamic theology and sacred law
Paikal	Traditional unit of measurement for land. One paikal is equal to 360 jeribs
Qarya	Rural village, which may or may not have a clearly recognized boundaries
Qaryadar / Arbab	Official village representative who liaises between local community and district government
Yakadana	The smallest stream or brook which is used by one farmer

Acronyms

CDC	Weir or intake for a canal
DEW	Department of Energy and Water
FGD	Focus Group Discussion
KII	Key Informant Interview
NMoFA	Norwegian Ministry of Foreign Affairs
MRRD	Ministry of Rural Rehabilitation and Development
SRDP	Sustainable Rural Development Programme
WUA	Water User Association
WUG	Water User Group

List of Graphs, Tables and Maps



INTRODUCTION

The people of Afghanistan have been affected by conflict for approximately 40 years, in addition to intermittent incidents of drought, flooding, and other natural disasters over the years. As such, in order to promote development and improvement in livelihoods, public service access, and local community governance, identifying and addressing the root causes of conflict and instability within communities in rural Afghanistan is critical. Most organisations have typically targeted official administrative units, including village, district and provincial governmental bodies. However, many of these units do not accurately reflect the local communities they govern over, and may not be the best point of entry for engaging with community level issues. Within this context, the Norwegian Ministry of Foreign Affairs (NMoFA) funded Sustained Rural Development Programme – Phase IV (SRDP IV) project has since 2018 aimed to address the root causes of instability and poverty in Faryab, Jawzjan, Balkh, and Samangan provinces by identifying the local community areas and institutions by using area based approaches though local community units. By identifying the local community and its institutions, development actors can create a conducive environment for the active participation of local authorities and citizens in community-driven, area-based initiatives that contribute to improving basic service delivery and livelihood security.[4]

Between 2018 and 2019, REACH conducted an in-depth exploration into the local community units in the north of Afghanistan. Many scholars have noted that local community boundaries tend to conform with a territorial unit known as the manteqa that tend to be based around shared water resources, particularly for the purposes of farming and irrigation.[5] Previous research by ACTED has also noted that other water infrastructure tended to be organized at the manteqa level, and often reflected other shared resources and community structures as well.[6] In order to understand the linkages between water system management and the manteqa, REACH conducted a detailed mapping of water management structures across all 25 provinces of intervention by the SRDP IV Project in December 2020. However, this mapping did not deeply examine the formal and informal networks that were used to manage the water, how they functioned, and how they were related to the broader manteqa.[7] Thus, the following research was conducted in Khulm District of Balkh Province in order to better understand the existing water systems, how they work as well as to build a deeper understanding of how they relate to communal management of resources in manteqas in northern Afghanistan.

Manteqas

The post-2001 administrative boundaries of Afghanistan follow three main divisions: provinces, districts, and villages. However, Afghan communities are often structured around an informal unit, lying between the district and village, commonly referred to as a manteqa. The manteqa is generally discribed as a variable unit of social allegiance or spatial territory that may include several villages based on common resources, and culture values under a single local name, 'mustarikat'. It is roughly analogous as a physically territorial land unit to a qawm, where the qawm is the community and the manteqa is the land that typically belongs to and is used by the qawm.[8] Manteqas are often based around the comunal management of material resources by people living in a defined territorial unit, which can include irrigation land, pasture land, social infrastructure such as schools, mosques, and roads, or cultural practices, including the participation in weddings and funerals. Over time, these manteqas have taken on additional historical, social, and cultural meanings, forming a broader community to which all those living in them relate. The relationship between manteqas, resource management, and broader economic development has formed a cornerstone of the research conducted by AGORA in Afghanistan since 2018, of which this report is a part.

[4] The four provinces were selected due to ACTED's longstanding acceptance and work there as well as their inclusion in the Afghan Government's Citizen Charter programme (ACTED, Sustainable Rural Development Programme, Phase IV Concept Note, June 2017).
[5] Roussel, "Constraints and perspectives in the present context for the elaboration of an immediate rehabilitation strategy of the Afghan rural areas," UNORSA, June 1993.
[6] Social Water Management in Faryab: A Manteqas Case Study, ACTED, 2016.
[7] AGORA, SRDP IV District Water User Group Mapping, December 2019
[8] A *qawm* is a form of group solidarity that may be based on kinship, residence or occupation.

METHODOLOGY

To conduct this research, REACH conducted a detailed secondary data review of the existing literature, as well as two separate forms of primary data collection:

1. Key Informant Interviews (KIIs) with water managers
2. Focus Group Discussions (FGDs) with water managers and Water User Association (WUA) members

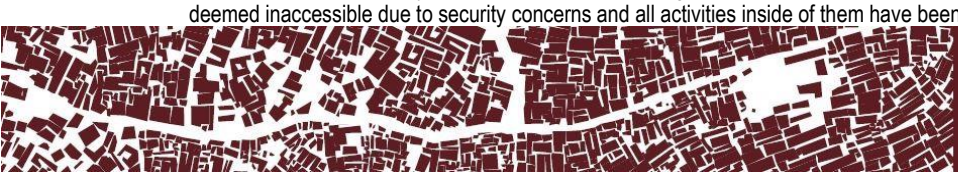
The secondary data review, conducted between 22 November and 3 December, identified previous studies into the research on water system management in Northern Afghanistan, including an AGORA in-depth study of the manteqa in Balkh and Samangan provinces (2020),[9] a detailed profiling of infrastructure and stakeholders (including water management and canals) in four northern provinces,[10] an AGORA study on canal structure and management,[11] and an ACTED study of the social water management in Faryab Province (2016).[12] The secondary data review helped REACH to identify five key research questions, for which tools were developed to help answer:

1. What are the rivers, canals, and dams and related infrastructure that make up the district's water system?
2. Who manages the water and what structures are in place to help manage the water systems?
3. How is water distributed and allocated by the canal system?
4. How is the water system maintained and who is reponsible for maintenance?
5. What land is supported by the irrigation system, and how productive is the land in terms of agricultrual output?

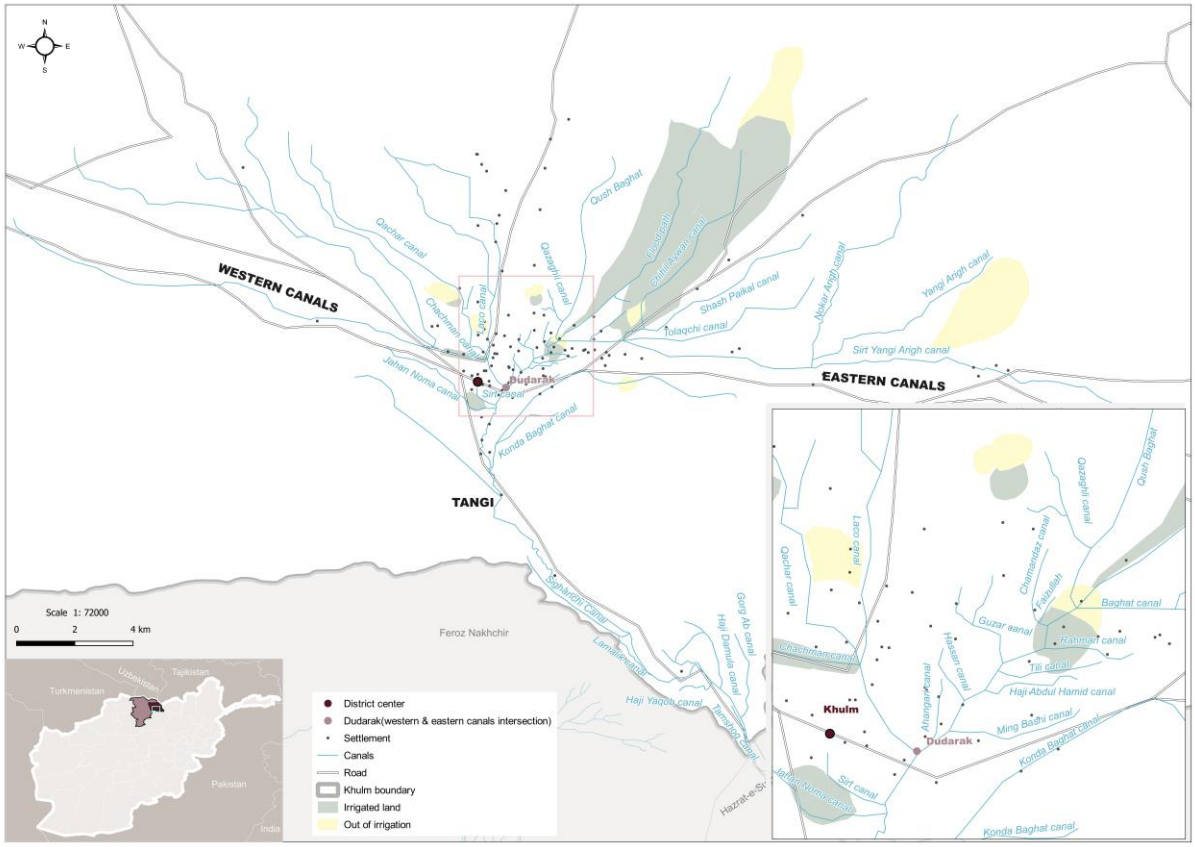
Area of Assessment

In order to pilot the tools, REACH selected Khulm District, Balkh Province. Khulm District is both part of the ongoing SRDP IV project in Northern Afghanistan, and was also a secure location that was easily accessable from the city of Mazar-i-Sharif, where the REACH data analysis team is based and could provide support for the data collection process.[13] This ensured a stable, easily accessible location with nearby analytic support. A map of Khulm District and its canals are shown on the next page:

[9] AGORA, "Manteqa: A territorial and social unit, based on common economic resources and social values / norms," *(forthcoming)*
[10] AGORA, SRDP IV Executive Summary, December 2019
[11] AGORA, SRDP IV District Water User Group Mapping, December 2019
[12] Social Water Management in Faryab: A Manteqas Case Study, ACTED, 2016
[13] The Sustained Rural Development Programme Phase IV program as a whole is operational in 24 districts. However, since the deterioration of the security situation across Northern Afghanistan that has occurred over the course of 2019, three districts have been deemed inaccessible due to security concerns and all activities inside of them have been suspended.



Map 1: Reference map of Khulm District canals, December 2020

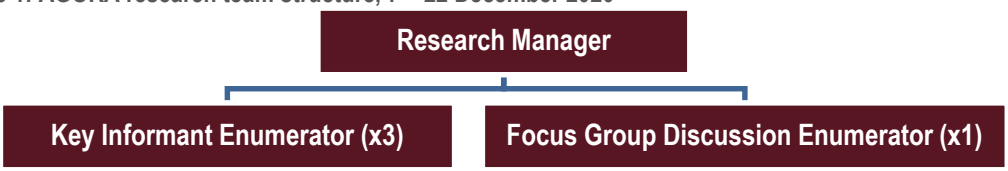


Primary Data Collection

Primary data collection included both the aforementioned KIIs and FGDs with water managers in Khulm District. A quantitative KII tool and qualitative FGD tool were developed between 1 – 22 November. As the assessment was designed to be a pilot for a larger manteqa and water management assessment to cover all 25 of the SRDP IV districts, and the assessment team was unsure of what kinds of responses structured questions should have, both tools were designed to be pen and paper and open-ended, in order to help inform responses that could later be used to programme closed-ended, smart-phone based tools.

To conduct the interviews, four enumerators were recruited to conduct data collection; three would conduct KII interviews, while a fourth would transcribe the FGDs conducted by the Research Manager (RM). The RM trained the enumerators between 7-9 December. Both the training and subsequent data collection involved the use of COVID-19 mitigation measures, including small FGD groups, the use of Personal Protective Equipment (PPE), and socially distanced interviews, in accordance with IMPACT COVID-19 mitigation guidelines.[14] A figure showing the structure of the research team is shown below:

Figure 1: AGORA research team structure, 7 – 22 December 2020



[14] REACH, SOPs for Data Collection during COVID-19,May 2018.

Key Informant Interviews (KIIs)

On 10 December, the REACH RM met with the Khulm Department of Energy and Water (DEW) and identified the 34 canals and their water managers. These managers were either mirabs or chakbashis, traditional water managers of canals and their tributaries. These water managers were then contacted by the enumerators, who arranged for interviews to be conducted at the ACTED office in Khulm Town. One KII interview was conducted for each water manager. Each interview took approximately one hour to complete, and given the time it took to arrange the interviews, meet, and transcribe the findings, only two interviews per day were conducted. These interviews were quantitative in nature, with specific, structured questions per canal, though as the assessment was a pilot, they were done with pen and paper tools, which were used to help inform the response options for a quantitative tool that was used during the main assessment. The tools had covered the canal attributes, maintenance, and land that the water is used to support (particularly in the way of agriculture). Each KII also included a participatory mapping component, where the canal systems and their needed infrastructure were mapped onto a detailed map of the district created using satellite imagery.

Focus Group Discussions (FGDs)

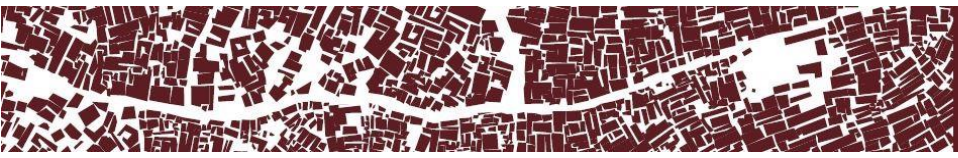
FGDs were conducted by the Research Manager, with one enumerator assisting in transcribing the responses as the RM facilitated the interview. Participants were drawn from some of the water managers interviewed as KIIs and other members of WUAs in Khulm District. The interviews were stratified based on the location of the canals in Khulm – the East Branch, West Branch, and canals located in the river above both branches, in order to understand if there were any differences in water usage and management between geographic areas. Each interview involved four to five participants; this was reduced from the normal six to eight as a COVID-19 risk mitigation measure. All interviews were conducted in the ACTED Office in Khulm Town. Questions were kept open-ended in order to allow the freedom of respondents to explain their responses fully. The schedule of each interview was as follows:

Table 1: Focus group discussion interview schedule, 13 – 22 December 2020

No	Institution name	Location of FGDs	Number of Respondents	Date	Time	Location
1	Mirab /Mirabshi/ Members of WUAs/AUGs	ACTED office Khulm	5	13 December	9:30 am	2 FGDs in the East Canal
2			5	14 December		
3			5	15 December		
4			5	16 December		2 FGDs in the West Canal
5			4	17 December		
6			4	20 December		2 FGDs in the Canals located above then the East and West Canals
7			5	21 December		1 FGD in the Tangi area

Data Analysis

Data was collected between 13 and 22 December 2020. Following data collection, all KII data was entered into a database between 23 December 2020 – 3 January 2021. All responses were then cleaned and standardized based on similar responses, to create a uniform and comparable dataset between all 34 canals on 4 January. FGDs were transcribed between 5 -12 January, and analysed between 13 -25 January 2021 through the use of a saturation grid, the key findings from which were used to guide the following analysis. All KII data was therefore quantitative, while the FGD data was qualitative in nature.



Limitations

Data was collected with traditional community leaders, who are nearly always male; as a result, women's voices were not heard as part of this data collection study. In addition, only the water systems of Khulm District were assessed, meaning that, in terms of identifying manteqas, there may be additional criteria that was not accounted for to validate the manteqa boundaries, leaving only the water systems as a guide for identification of the manteqa. However, it should be clarified that the community leadership consulted as part of this assessment were clear that while there were other criteria beyond the water systems that defined the manteqas in Khulm District, that the water systems that were mapped out were consistent with their own definition of manteqa boundaries in the district.

In addition, it must be noted that all data was self-reported by respondents, meaning that repondents may have been influenced by their own personal interests or biases, particularly in regard to the discussion on water shortages and conflict management.

FINDINGS

This section of the report examines the main findings from the assessment. First, it covers the water network infrastructure, including the surrounding community, availability of water by season, and both presence and need for water related infrastructure. Following this, the study explores the structure and the dynamics of the water management system for the network, including the history, roles and responsibilities, hierarchy, selection procedures, and relationships with different government departments that define the overall function of the water management systems in Khulm District. Third, the methods of water allocation are explored, including measurement, problems with allocation of water, and roles and responsibilites for water allocation. Fourth, the mangement of land Khulm District is explained, including the availability of different land types, irrigation and productivity of these land types, and the crops that are grown. This is followed by a brief examination of the linkages between water management and the manteqa concept, after which a conclusion summarises all of the key points and findings of the report.

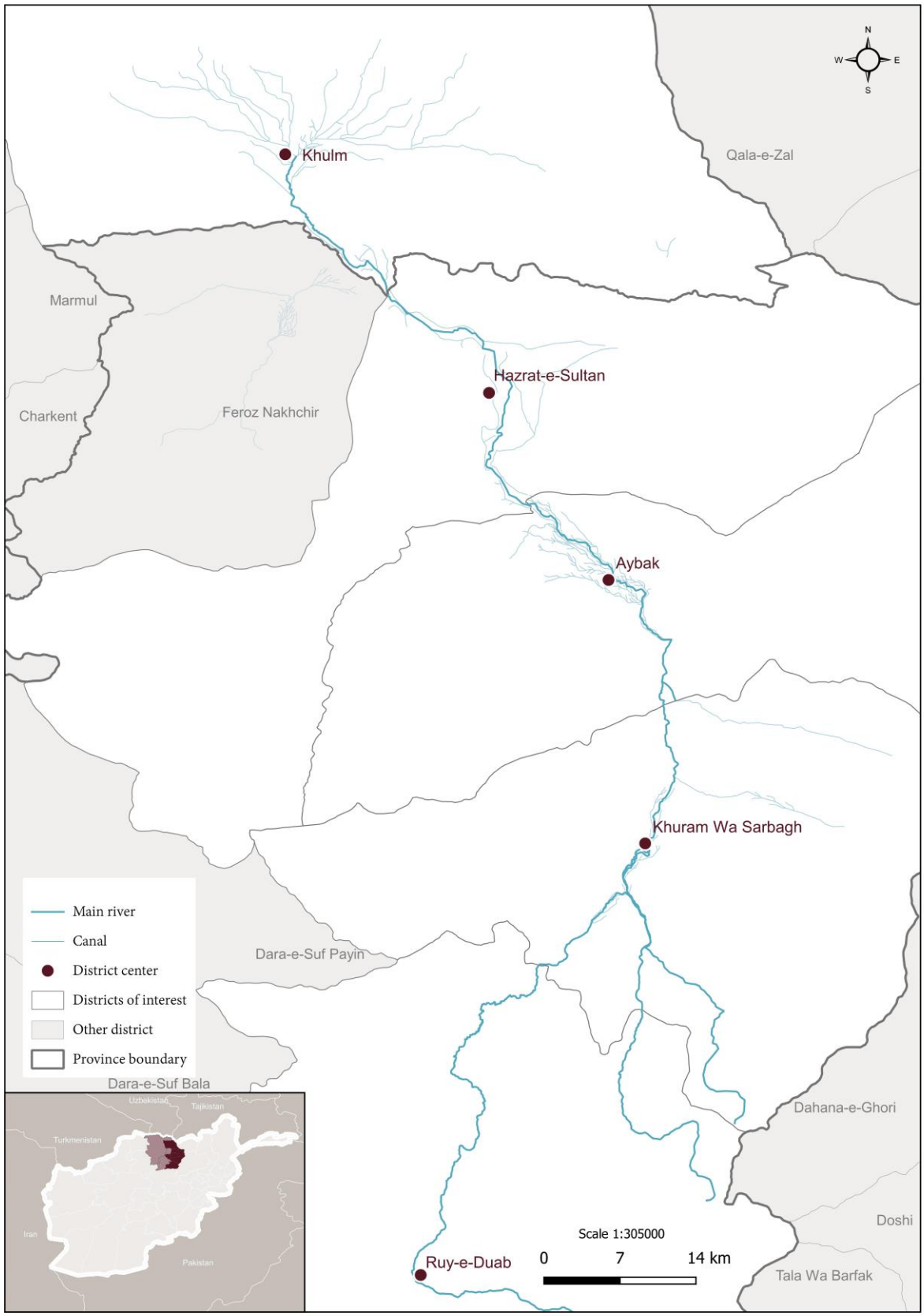
Water Network Infrastructure

Geography

Khulm District is also unofficially known as Tashqurghan. It was originally a district of neighboring Samangan Province, but was separated from the province and made a part of Balkh Province, which it presently belongs to, in 2002. Khulm District is situated in a strategic geographical location on the Kabul - Balkh highway, about 60 kilometres to the east of the Mazar-i-Sharif, the capital of Balkh Province. Khulm shares borders with three districts inside of Balkh, with the two districts of Samangan, and with two districts of Kunduz Province. A corner of the district shares a border with Baghlan Province as well. The estimated population of Khulm District is 56,364 individuals,[15] belonging to different ethnicities including Tajik, Pashtun, Uzbek, Hazara, Turkman, and Arab. Darya-e-Tashqurghan, and Darya-e-Khulm are the two names that are used interchangeably for the Khulm River by residents of Khulm District. This river is a national river, meaning that it starts and ends inside of Afghanistan's borders.[16] Darya-e-Tashqurghan starts from the district of Ruy-e-Duab in Samangan Province, passes by Kuram wa Sarbagh, Aybak, and Hazrat-e-Sultan districts, and then enters Khulm District. It also ends inside of Khulm District.[17] All of the districts that this river passes by use its water for irrigation. Inside of Khulm District, there are 34 canals that come from the Darya-e-Tashqurghan. All these canals can be divided into four regions/areas: above the Tangi, or mountain pass (Sayaad and Syghanchi), Darayakhana-e-Sharqi (East Canal) and Darayakhana-e-Gharbi (West Canal), which are divided by the Du-darak, the location in Khulm where the river divides into the east and west canals that feed the Khulm delta, and the canals located between the Tangi and the Du-darak.

[15] AGORA, Sustained Rural Development Programme – Phase IV, Manteqa Profiles: Balkh, August 2019.
[16] Masood Ahmad and Mahwash Wasiq Water Resource Development in Northern Afghanistan and Its Implications for Amu Darya Basin (World Bank Working Paper, no 36 (2004).
[17] The first three are the districts of Samangan province while Khulm has been the district of Balkh province since 2002.

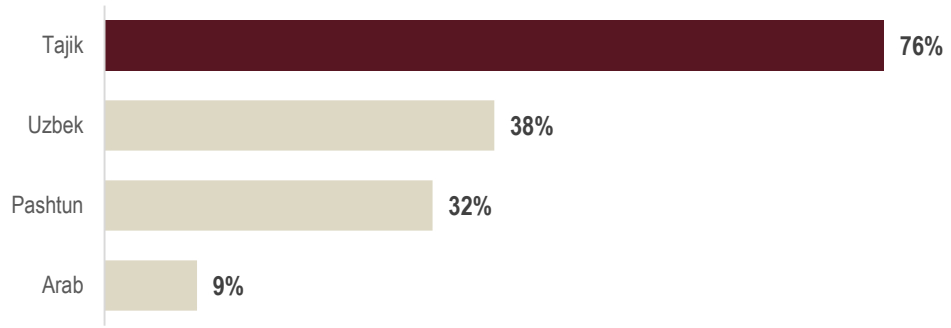
Map 2: Districts Darya-e-Tashqurghan passes through, December 2020



Communities

The communities in Khulm District that used water from the Darya-e-Tashgurghan are very diverse. According to KI interviews with water managers, while more than 70% of the canals are used by Tajik households, nearly 40% are used by Uzbek households, and 32% are used by Pashtun households. Fewer than 10% of Arab households use the canals from the Darya-e-Tashgurghan. While not noted by any KIs in the study, previous research shows that there are some small communities of Hazara and Turkman in the area as well.[18]

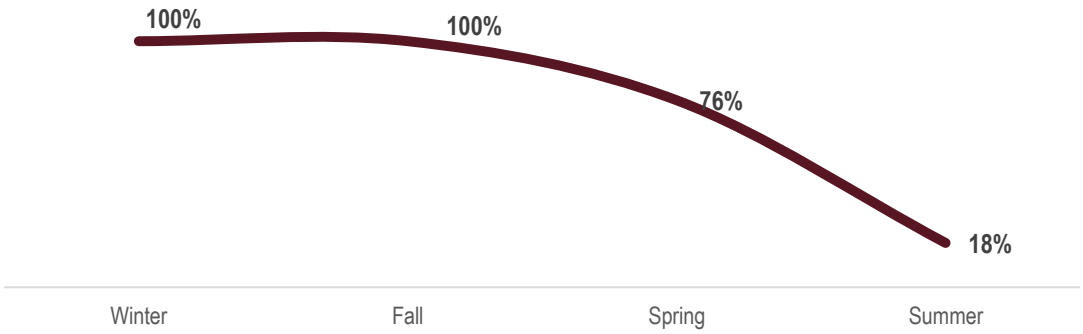
Graph 1: Proportion of ethnic groups using canals in Khulm District, as reported by water manager KIs, December 2020[19]



Canal Functionality

All 34 water manager KIs reported their canals to be operational and receiving water from the Darya-e-Tashqurghan in the fall and winter. However, this reportedly fell to roughly three quarters (76%) of canals in spring, and less than one-fifth (18%) in the summer, as the water system dries up and water flow from Samangan Province declined. During this period, water managers in Khulm District reportedly only had water from a spring called Hayaat, located in the Tangi area, the narrow valley through with water travels between the mountain range separating Khulm District from Samangan Province.

Graph 2: Proportion of water manager KIs reporting water is available for their canal in Khulm District, by season in Khulm District, December 2020[20]



Very few water manager KIs reported that their canals had the appropriate infrastructure to be functional; of the 34 canals in Khulm District, only 2 (6%) were reported to be fully functional. The vast majority (92%) were only partially functional and in need of repair, either due to damage caused by flooding or a lack of resources to maintain the canal over the years. Four (12%) canals were reported to not be functional; of these, three were reported to have

[18] ACTED, Manteqa Profiles (2019), Sustained Rural Development Programme Phase IV.
[19] Respondents could select more than one option.
[20] Ibid.

broken due to flooding, while the remaining canal had ceased to function due to a lack of maintenance over time. The lack of functionality was likely linked to the lack of robust infrastructure used to construct the canals; only 38% of water managers reported that their canal's abgardan (intake) had been constructed with concrete instead of the natural earth, which is easily washed away, and only 26% reported that their canal had a gate to control water.

Graph 3: Proportion of water manager KIs reporting canal functionality in Khulm District, December 2020

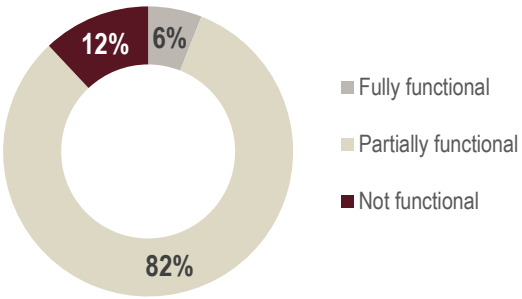


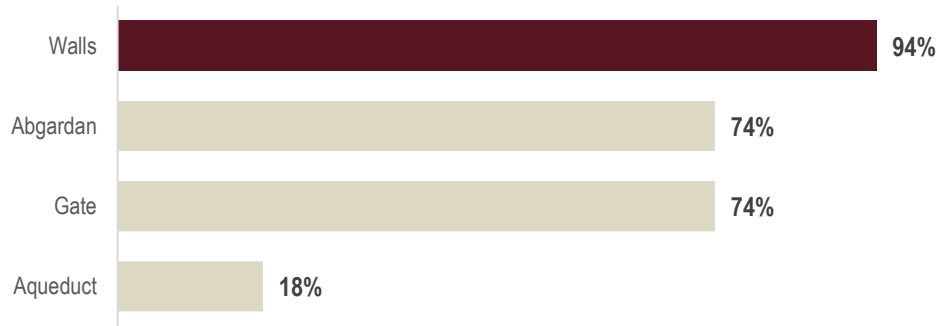
Table 2: Proportion and number of reported canal infrastructure as reported by water manager KIs in Khulm District, December 2020

Canal infrastructure	Number of canals	Proportion of canals
Concrete Abgardan	13	38%
Canal Gate	9	26%

Canal Construction and Repair Needs

However, even water manager KIs who managed canals with concrete abgardans and canal gates reported that the infrastructure was often in need of repair. While two water managers reported that their canals had suffered unspecified damage from flooding, the majority of water managers reported that their canals either needed repairs to existing infrastructure or construction of new infrastructure that was not present. As shown in Graph 4 below, many canals needed additional infrastructure to make the canals fully functional.

Graph 4: Proportion of water manager KIs reporting need for construction for their canals in Khulm District, December 2020[21]



Water manager KIs reported that retaining walls were most needed; 94% of water manager KIs reported a need for new walls, while 74% reported needing concrete abgardans and gates. This aligns with the FGD findings that found flooding in winter and spring to have damaged the canals, as well as fields and houses.

In addition to walls, abgardans and gates were reported as both needing to be constructed and repaired for the canals. This infrastructure is critical for water managers as abgardans and the gates of the canals allow for greater

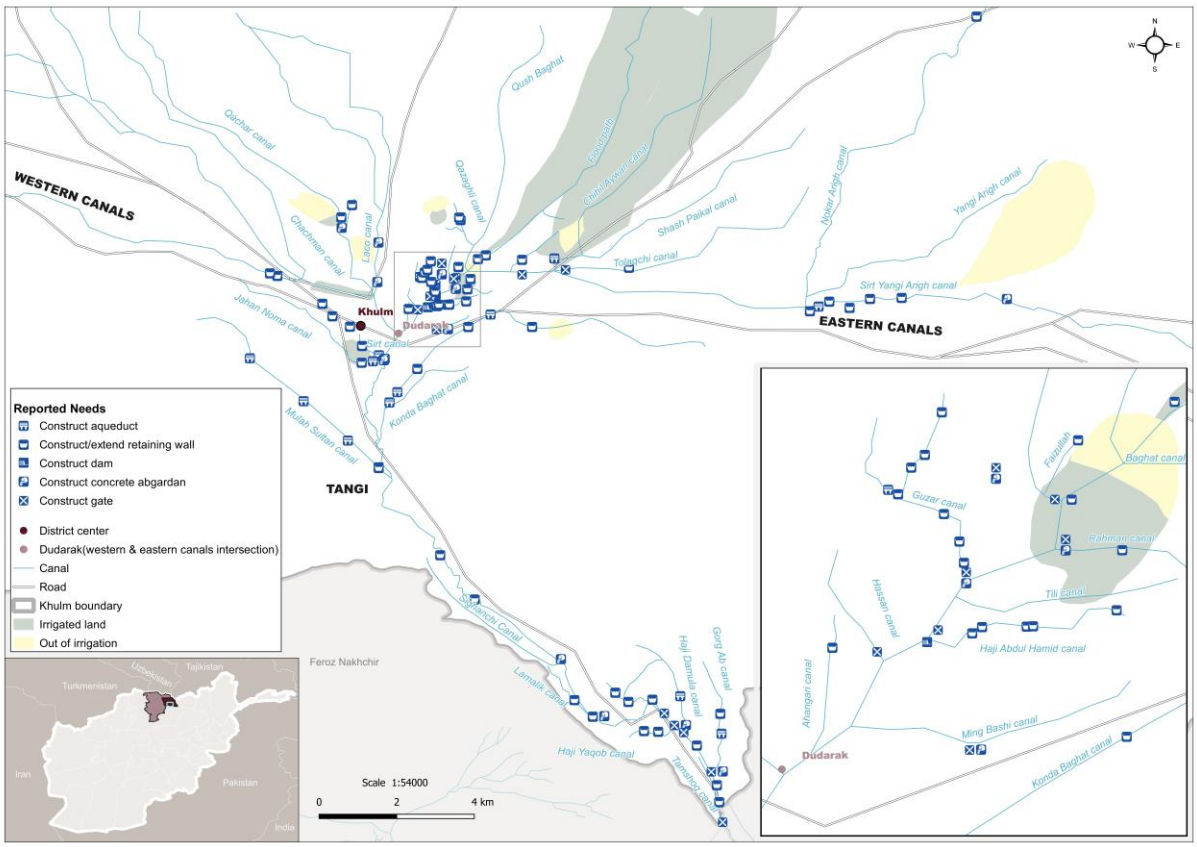
[21] Please note that some of these canals may have had some of the infrastructure present, but required construction of additional infrastructure, such as additional walls beyond what was already there. Respondents could select more than one option.

control of water measurement and distribution, as well as avoid the loss and misuse of water.[22] In addition, this can reduce the work of the croppers/farmers, who otherwise must compensate for the lack of gates and adequate abgardans by putting sacks full of sands and stones in the river to divert water from the river into their canals as in the picture below. The first picture below shows the abgardan, while the second picture shows the gate.

Photo 1: Photographs of abgardan (left) and gate (right) in Khulm District. Photo Credit: Kandiwal Wali, December 2020.

The map below shows the locations where water manager KIs reported that their canal required additional infrastructure.

Map 2: Needed canal infrastructure reported by water manager KIs in Khulm District, December 2020



[22] *Abgardan* is the local name of Weir or intake for a canal. Abgardan diverts the water from the river to the canal. Each of these intakes has a gate installed to control the water.

Water System Management

Water System History

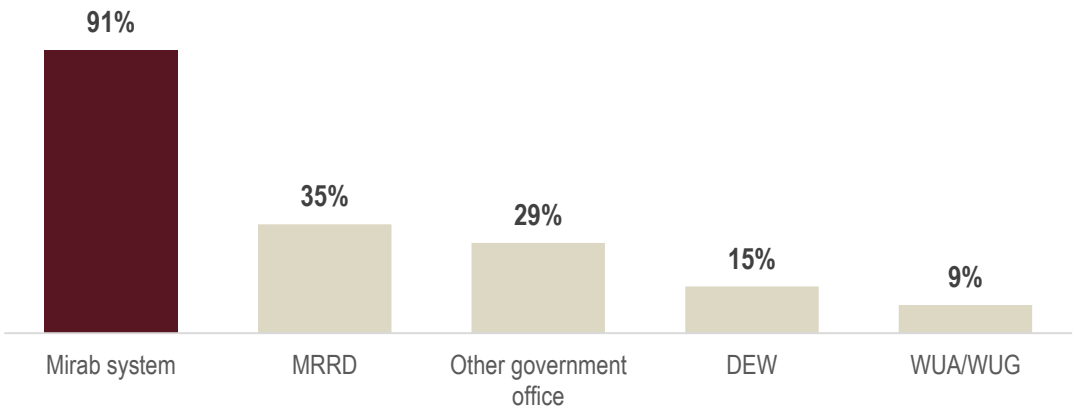
Despite the presence of district governmental bodies such as DEW and Ministry of Rural Rehabilitation and Development (MRRD), and humanitarian organisations' engagement with WUAs and other community-oriented bodies, water management was found to primarily be managed by traditional bodies, specifically, the local institutions known as the mirab or the mirab system, which manages the communal water for irrigation. The water of Darya-e-Tashqurghan is managed through this traditional water management system, which was reported by FGD participants to have been established approximately about 200-300 years ago in what is now Khulm District, and has not changed since then.

Most FGD respondents reported that there were several purposes behind the establishment of the mirab system.[23] Aside from the traditional institutions/bodies created to manage local affairs, several elected bodies, official and legal structures and institutions have also been created to assist in managing water irrigation, including WUAs after 2001.

Water System Responsibility

However, both the KII and FGD respondents were clear that the mirab system is still the main system in Khulm District used for maintaining the system of irrigation water; 91% of water manager KIs reported that the mirab system was involved in maintaining the canals, while less than 10% reported that WUAs were involved. Only 15% of water manager KIs reported involvement from DEW, while approximately one third reported that MRRD or other government offices provided some support. The importance of MRRD was due to its involvement in the creation of and continued relationship with the National Solidarity Programme (NSP), which has implemented projects including the irrigation water infrastructure at the local level throughout Afghanistan. The NSP is implemented through the Community Development Councils (CDC), a form of local leadership structure. One of the CDC committees is dedicated to maintain construction projects implemented by the programme.[24]

Graph 5: Proportion of water manager KIs reporting involvement of institutions in maintaining infrastructure in Khulm District, December 2020[25]



[23] The purposes behind the establishing of the mirab system were: A) to distribute the irrigation water properly, B) to avoid misuse of the water, C) to ensure that no individual can take another's water, D) to avoid any possible conflict, and E) to resolve any conflict that may arise over the irrigation water.

[24] Community Development Councils (CDCs) were elected bodies at the village level in Afghanistan, tasked to prioritize the needs their communities, take part in planning, and then having the role of the observers in the implementation of the projects implementing in their respective village. CDC were created through the National Solidarity Programme (NSP), one of the biggest development program of the Ministry of Rural Rehabilitation and Development (MRRD).

[25] Respondents could select more than one option.

Water System Hierarchy

In Khulm District, the mirab system is reportedly organised around a four-step hierarchical structure. Each of these levels has its own responsibility in terms of water management and geographical area, which is detailed in Table 3 below:

Table 3: Khulm District water manager hierarchy and responsibilities as reported by FGD participants, December 2020

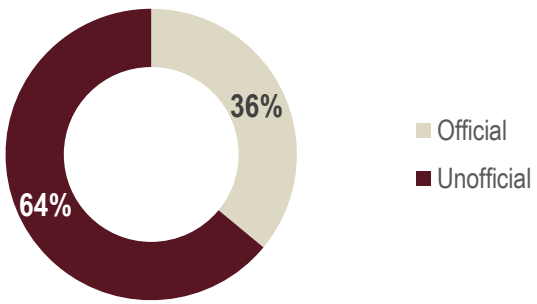
Title	Water Management Responsibility	Area of Responsibility
Mirab Bashi	Managing the irrigation water for the entire district	Entire district
Mirab / Mirab-e Omumi	Managing the water of East or West branch in Du-darak	Several canals/or one branch in Du-darak
Mirab/ Chakbashi	Managing the water at the canal level	One canal or two canals in rare cases
Darakban	Making sure that the water flows into the right direction	Several canals where their intakes are in the same place

In general, the mirab and chakbashi labels were reported to have been used interchangeably; however, it was found that chakbashi tended to manage canals that have no horticulture. The quantitative data of this study shows that the title of mirab was used by for 56% of water managers, and chakbashi was used by 41% of water managers, while only one (3%) canal was reported to have no management.

Graph 6: Proportion of canals by traditional water managers in Khulm District, December 2020, as reported by water manager KIs, December 2020

Interestingly, a majority of these positions, including the mirab bashi responsible for the entire water management system for Khulm District (excluding the Tangi area), were reported to not be official, government-endorsed positions. Unofficial positions were even more common in the Tangi area up-river, located in the valley separating Khulm District from Samangan Province, before the Darya-e-Tashgurghan reached Khulm Town, where many water managers were reported to work in a private capacity outside of the larger district water management system.[26]

Graph 7: Proportion of water manager KIs by official status in Khulm District, December 2020



[26] This means that the mirabs in Tangi area do not go through the election process as they inherit it from there forefather and they are not paid. In addition, the mirabs are from those households who have more land compared to others.

Water Manager Selection

With the exception of the water managers in Tangi area, FGD participants did not report any major differences in the selection process of official and unofficial mirabs or chakbashis. To select an official water manager, community members reportedly gathered in a mosque or a community member's guesthouse. It was reported that they usually tried to select someone who was considered by the community to be honest, understand water distribution, is of middle age or older, and is able to be decisive. After agreeing on a person to be the mirab/ chakbashi, they wrote a letter, and all the participants signed it. The letter was then taken to the district governor's office, and after being approved by the district governor, a copy was sent to the DEW. The selected candidate was then an official mirab or chakbashi. Unofficial water managers went through the same process, except for the writing of the letter. However, in the Tangi area, where all mirabs were reported to be unofficial, there was no reported community selection process. Instead, the process was reported to be hereditary, and typically inherited by a male family member from their father.

Functionally, there was no reported difference between the responsibilities of official and unofficial traditional water managers. These traditional water managers were paid by members of the communities that they serve either in cash or a share of their harvest.[27] An exception to this were the mirabs in Tangi area, which were not paid at all, and were reported to do their work on a voluntary basis.

Water Management Organisation Relations

Although they are functionally independent, mirabs and chakbashis were reported to typically maintain good relationships with the qaryadar (village head-man), WUAs, where the WUA had been established, as well as with the DEW. However, they reportedly did not maintain links with the MRRD. In the government structure, DEW was the most relevant department, and mirabs first approached them when there were any issues with the irrigation water that they were unable to manage themselves, or when government actors were involved. FGD participants noted that although all irrigation water documents were kept in the DEW office, mirabs were not official members of any governmental department, and therefore remained accountable only to the communities that selected them. Participants further explained that local community governance, including the qaryadar, malim, and mullah, as well as the WUAs, were not directly involved in managing irrigation water, but they did get involved whenever a mirab or chakbashi needed them to resolve a conflict. Furthermore, WUAs were reported to often be used by development organisations as entry points for engagement when implementing their development projects focused around irrigation.

Water Allocation Methods

Water Measurement

In Khulm District, FGD participants reported that they measured water from their canals based on a system of square-inches, while the users of the water from the same canal usually measured water distribution in a system using hours.[28] Most water managers were aware of how many square inches their canal produced; only 10 water managers were unsure of the amount of water their canals produced, and these were mainly the unelected water managers in Tangi. While the amount of square inches per canal ranged widely, between 12 and 670, the average square inches per canal in Khulm District was 117. The exact number of square inches per canal is included in Annex I.

This method of water allocation was reported to have been in place since 1923. The irrigation water was reported by FGD participants to be allocated on the basis of the type of land, crops grown on the land, and presence of

[27] This payment is called mirab-Pooli. Each mirab omumi (general mirab) receives 4 ceer wheat and/or barley, from one paikal land for one year, while a Chakbashi receives 16 ceer and a Darakban receives 2 ceer wheat from one paikal land for the same period of time. As a total a cropper should pay 22 ceer grain for one paikal land each year to the water managers. The horticulture gives 300-400 AFN after each irrigation turn to the mirab. However, there are many mirabs works voluntarily particularly in the canals uses for horticulture.
[28] A list, containing the name and the amount of water of each canal is provided in Annex I at the end of this paper.

horticulture. This means that the needs of each parcel of land, its crops, and horticulture were first assessed, and then a decision was made by the water manager as to how many square inches of much water it should get. Between the years 1937-38, it was reported that all the lands and water in Khulm District were reassessed to find out how much water each farmer was taking, including who did not have enough, who was taking too much, and the water was redistributed based on need. FGD participants affirmed that there had not been any re-assessment of water usage by users or the amount of water available in Khulm District since 1938, and they were still distributing water in each canal based on the measurements taken then, despite clear changes in the amount of water available.

Water Management Problems

A major problem with the water system was reported to come from the Tangi area, where no system of measurement or allocation was used, either for the amount of water in the canal, or its use by water users. Instead, water users simply took as much as they need. Most FGD participants in all parts of Khulm expressed that, overall, the system of water distribution worked, and everyone was happy with it. However, many also noted that there was a collective action problem, as it was felt that water managers between the Tangi (and also those above the Du-darak, where the river splits into East and West Canals) were not managing their water sources to control the amount of water. Two types of complaints in this regard were noted:

1. Participants complained that water managers did not follow the rules of the water allocation, and therefore took more water than their fair allocation
2. Participants complained that prominent members of the community were abusing their influence to ensure more water was allocated to their yakadana.[29]

The yakadanas, or the smallest streams or brooks in an irrigation network, served only one or a few households, and presented a unique problem. Households with yakadanas were often left out of the overall management of the water system, and therefore did not have to follow the same rules for water allocation. Yakadana owners could therefore use water any time and of any amount that they wanted from the canal without consequence.

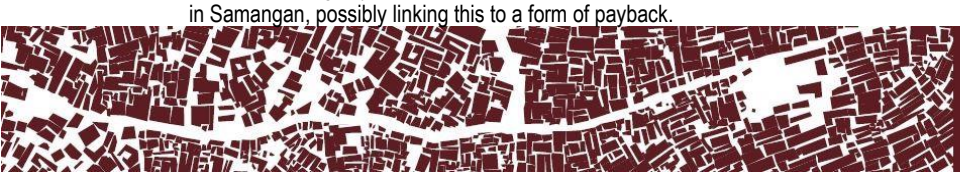
A larger problem noted by FGD participants with water allocation was linked to disputes between Khulm District and Samangan province over the collective accountability for management of the Darya-e-Tashgughan as a whole. Khulm District was once a part of Samangan Province, but was separated by the National Government in 2002 and made part of Balkh Province. Following this split, communities in of Samangan Province allegedly ceased to include Khulm as part of their responsibility to provide water for the Darya-e-Tashqughan.[30] However, while FGD participants were clear about their belief that the source or the problems came from Samangan Province, these claims are difficult to prove without the input of communities from Samangan.

Responsibility of Maintenance

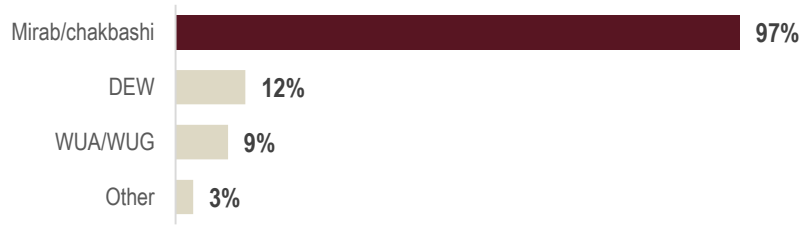
In a reflection of water manager's perceptions of who managed the water system, 97% of KI water managers also believed that it was the responsibility of traditional water managers, such as mirabs or chakbashis, to maintain the canal as well. Only a minimal number of respondents believed that WUAs or DEW had any responsibility. In the Tangi area, there was no the involvement of any governmental department, including the DEW or WUAs in water management.

[29] Yakadana is the smallest stream or brook which is used by one farmer.

[30] This was allegedly linked to the belief that prior to the split, before 1980, The people in Khulm were taking more water than other districts in Samangan, possibly linking this to a form of payback.



Graph 8: Proportion of water manager KIs reporting responsibility for managing the canal, by institution responsible in Khulm District, December 2020[31]



FGD participants clarified this further by noting that while they believed mirabs and chakbashis to primarily be responsible, DEW, WUA, and MRRD also had responsibilities as well, particularly in regards to construction and funding of improvements for the canal. For example, the mirab had the responsibility to inform the people and the DEW of issues in a timely manner, while it was DEW's responsibility to actually fix the problem. In addition, WUAs and MRRD were responsible for the funds and to implement rehabilitation and development projects. Moreover, one of the sub-committees of the Community Development Council (CDC) was responsible for maintaining the projects implemented by the MRRD through the CDC programme. Thus, each of them had a role in maintaining the water system.

Land Management

Land Availability

While water systems were communally managed, both KIs and FGD participants reported that a majority of the land in Khulm District was privately owned. In Khulm District, these were primarily a few large land owners on whose property many small farmers cultivated as sharecroppers.[32] FGD participants noted that farmers in Khulm District have had to deal with a lack of water for irrigation as the available water actually irrigates less than half of the cultivated land available.[33] It is not clear how much this can be solved, as even when Khulm was part of Samangan Province there was reportedly not enough water. However, following the split, the problem was reported to have become much worse. In response to the lack of water, large or even some medium landholders engaged in crop rotation, dividing their land into three portions and cultivating one portion each year while the other two remained uncultivated.

Table 4: Reported total jeribs and average jeribs per canal by land type in Khulm District as reported by water manager KIs, December 2020

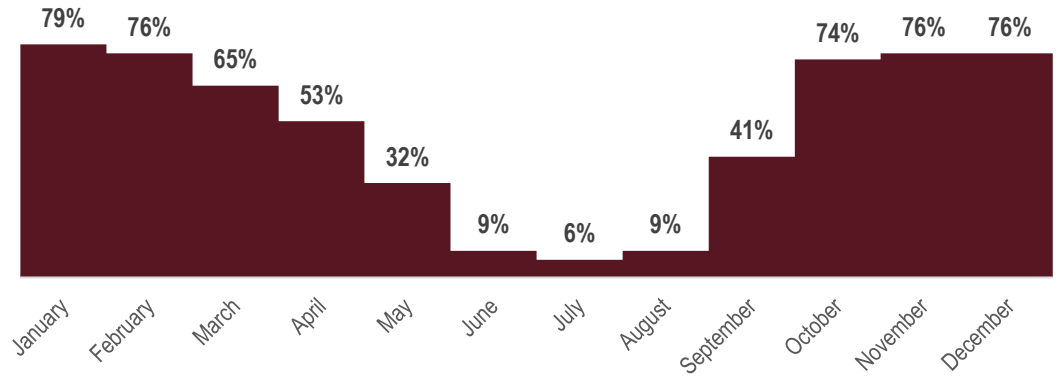
Land Type	Total (in jeribs)	Average per canal (in jeribs)
Irrigated	**47,186**	**1,388**
Unirrigated	**61,793**	**1,817**
Horticulture	**7,391**	**217**

Irrigation

Graph 9 below shows that the main irrigation period in Khulm District lasts from September to April. However, FGD participants noted that while there is much less water in some areas, irrigation continues across the district all year round.

[31] Respondents could select more than one option.
[32] FGD participants estimated that large landholders in Khulm District had between one and one and a half paikal of land. One paikal land is equal to 360 jeribs. The medium-sized landowners, who made up the majority of landowners in Khulm, held 50 to 100 jeribs, while the small landowners held 10 to 15 jeribs. The large horticulture owners held between 15 to 20 jeribs, medium sized horticulture owners held around 5 jeribs each, while the smallest owners held approximately 1-2 jeribs.
[33] The data of this study shows that there is more than 47,000 jeribs cultivated land, and 7,400 jeribs horticulture, irrigated by the Darya-e-Tashqurghan, in Khulm district. However, more than 60,000 of the cultivated land remains from irrigation.

Graph 9: Months of irrigation reported by water manager KIs in Khulm District, December 2020[34]



Crops

The main crops grown and harvested were reported by water managers to be wheat, barley, flaxseed, and cumin. The table below shows the outputs, profits, and planting seasons for each crop, respectively.

Table 5: Reported common crop types, output, average price, and time of harvest reported by water manager KIs in Khulm District, December 2020

Crop	Total output (in ceer)	Average price per ceer (in AFG)	Harvest month
Wheat	1,537	143	June
Barley	1,200	112	May - June
Flaxseed	800	212	May - July
Cumin	125	800	May - June

Horticulture was less common, but still widely grown throughout Khulm District. The following output and prices per type of fruit, along with the common harvest months, is shown below:

Table 6: Reported common horticulture types, output, average price, and time of harvest according to water manager KIs in Khulm District, December 2020

Horticulture type	Total output (in trees)	Average price per tree (in AFG)	Harvest month
Almond	1,382	189	June - September
Pomegranate	2,850	28	June - October
Apricot	50	27	May - June
Fig	280	70	June - September

Generally, water managers reported that farmers had not paid taxes for the past three decades in Khulm District; the only exception to this were farmers working from Teeli canal, who were reported to pay the taxes to the municipality office in the district. They reported paying 250 to 300 AFN per jerib per year.

Manteqa Linkages

According to previous research, manteqas may be based around the following three principles:

- One or more shared natural or economic resources, including communal irrigation water resources (river, canals, springs etc.), water management system, road, and shared communal land/pastureland;
- Cultural values/ practices (the way that they own, manage and maintain these common resources)

[34] Respondents could select more than one option.

- The natural boundaries that are based on several natural features such as abriza (watershed), seelbord (flood), hills, mountains, or Tangi (narrow valley)

As an irrigated district with a functioning water system, Khulm's manteqas were heavily based around the management of irrigation water. FGD participants highlighted that although Khulm District, on the surface, may have appeared to have a unified traditional water management system for managing the irrigation water for entire district, it was clear that there are significant differences in how the water system was managed above the Tangi (Sayaad and Seghanchi, or upper Khulm) and those in the delta area (lower Khulm). FGD participants reported that generally, irrigation water was managed by the traditional water managers called mirab/chakbashi in all of Khulm District, but there were clear differences in the way that they are managed in the area above the Tangi. For example, in upper Khulm, they reported that there was no selection process all, but these water managers all inherited their positions in the same way, while in lower Khulm, they were elected by the communities they represented. In addition, there was no payment for mirab/chakbashi in upper Khulm, while in lower Khulm they were paid by water users. There were several other differences between the two areas as well, which is explained in the table below.

Table 7: Reported differences in the traditional water management system inside of Khulm District according to FGD participants, December 2020

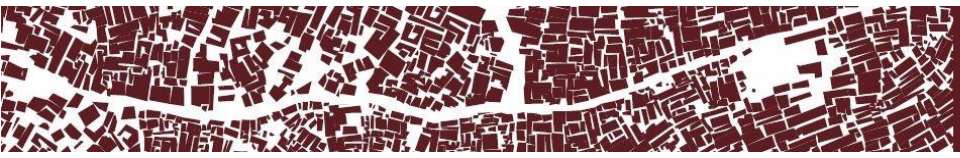
Water Managers	Lower Khulm	Upper Khulm
Mirab bashi	Yes	No
Mirab-omumi	Yes	No
Mirab/Chakbashi	Yes	Yes
Selection process	Selected	Inherited
Official/unofficial	Official and unofficial	Unofficial only
Duration of services	One year, but may remain longer	No time limitation

FGD participants also reported that the water distribution was different in upper Khulm compared to the lower Khulm. In upper Khulm, water was not measured at all, while in the latter, it was distributed in a systematic way, measured by cubic inches. In addition, there was no limitation in accessing water.

Table 8: Reported differences in the water distribution and allocation inside of Khulm District according to FGD participants, December 2020

Water issues	Differences in water management	Lower vs. Upper Khulm
Water distribution system	The water distributed by cubic inches	Lower
	There is not any system for water distribution	Upper
Accessing to water	Canal uses take water equal to the number of cubic inches that the canal manager allows them to have	Lower
	Canal uses take as much water as they want to and are not limited by water managers	Upper

The above differences in the water management system as well as water distribution indicated that there were two areas, or manteqas based on the irrigation water management system. Irrigation water systems are one of the most important elements of the manteqa concept, among the other shared resources managed at the manteqa level. This means that based on the findings of this study, and from the point of view of the irrigation system, Khulm would be considered to be two separate manteqas. It should be noted that the other criteria should be applied as well, although this is outside the scope of this study.



CONCLUSIONS

The investigation into the water management system in Khulm reveals a complex system with deep historical roots, that has been developed by the local community over centuries to collectively manage water resources for the entire community of Khulm. This system has endured new governments and development initiatives, and according to water managers, remains the most trusted and functional system that the community in Khulm uses to manage their water. At the same time, the community lacks the resources alone to maintain and improve the irrigation network; of the 34 canals in Khulm, only 2 were fully functional, the rest being partially or completely damaged due to flooding or wear from long term degradation.

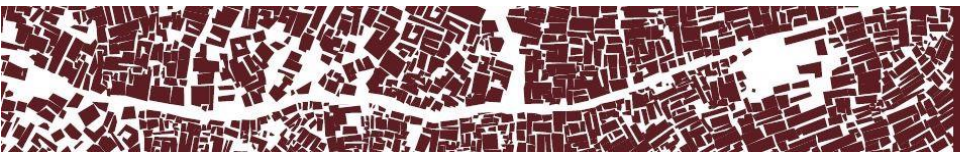
The need to maintain and improve the water system was extensive; nearly all of the canals required new retaining walls, and nearly three quarters of canals with existing walls needed them to be repaired. Approximately three quarters of canals need gates and their abgardans needed to be repaired or be constructed as well. Many of these needs were linked to the poor quality of the water infrastructure to begin with; only a third of canals have abgardans were made of concrete and a fourth had gates to control water. The lack of quality infrastructure had led to the loss of water and an increased in the likelihood of damage to the canal from flooding and erosion.

The water management system itself was found to be a community-developed initiative, and to predate the modern Afghan state. As the Afghan state has grown and solidified, the traditional mirab system was simply endorsed as the legitimate water management system for the community in Khulm District, rather than replaced with governmental departments. As a result, alternative water management systems, such as WUAs, were not considered by the community as the effective decision-making bodies over daily water management. Any new initiatives by external stakeholders to improve water management should consider the mirab system as the main entry-point for engagement.

At the same time, while the mirab system was designed to be entirely accountable to the community that selects its members, it lacked many of the necessary finances and material resources from DEW and development agencies that may be needed to make the necessary repairs and improvements to the water system in Khulm District. Mirabs and chakbashis still relied on DEW and other external actors to solve problems requiring resources that the community did not have. Improving the working relationship between mirabs, DEW, and other external actors could bring resources to bear and help empower the mirab system to make the needed improvements to Khulm's water infrastructure.

Management of the water system in Khulm included both unofficial and official members, both of whom worked closely together as part of a clearly structured system centralized under a central mirab bashi in Khulm. This system of water management was supported by a detailed measurement system of square inches that allowed each water manager to control the water for their canal. This water management served as a form of conflict mitigation, allowing each mirab to ensure that each water user received an equal share of water. However, this system was in danger of being undermined, both due to the use of outdated measurements that were nearly 100 years old and may no longer be accurate, and by the lack of inclusion of approximately 10 of the 34 water managers located above the Du-darak who were not fully integrated into the mirab system in Khulm and did not use the same water measurement system.

It was the lack of inclusion of all water managers in Khulm which posed the most difficult challenge for improving water management in Khulm District. Many of the water managers in Tangi received their jobs as a mirab through birth-rite, rather than selection by the community. This reduced the same types of accountability mechanisms that existed for the delta-based mirabs that were integrated into the mirab system. Compounding this were the yakadana owners, who were not part of the mirab system, and took as much water as they wanted. Improving accountability and integrating these water managers into the broader water management system will be critical to empowering the mirab system, particularly as a conflict mitigation mechanism.

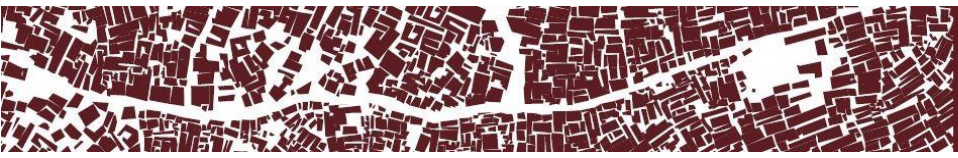


Conflict mitigation remained an important aspect of the mirab system. However, the mirab system appeared to have limits as a peacebuilding institution outside of the community; many respondents noted that the biggest issue for water facing Khulm District was the lack of water coming from the Darya-e Tashqurghan from Samangan Province, which the mirab system in Khulm District had no clear means of resolving themselves. Additional support to local governments and national level actors may be needed to resolve these issues.

While water is managed as a communal resource, the land the water supplied was not. Most land was reported to be privately held, mainly through large and medium-sized land-owners who allowed farmers to farm their land in exchange for a portion of their harvest. However, much of the land was still not productive, due to the aforementioned lack of water from water disputes with Samangan Province and a lack of adequate infrastructure to provide the water; FGD participants noted that the available water was often only enough for less than half of the cultivated land in Khulm District, and thus people could not cultivate their entire land every year. This was one of the main reasons for many farmers being unable to pay taxes. Except for farmers using one canal, farmers had not paid taxes for more than three decades. Outside of a resolution of this issue, the only means of improving water access in Khulm District may be through the infrastructure projects noted above to improve flow and reduce loss of water.

Finally, the way in which water infrastructure was managed strongly suggested the existence of two manteqas in Khulm; a manteqa in Upper Khulm, before Tangi and defined by hereditary water managers who didn't measure their water in a systematic way for the villages along the river, and Lower Khulm, which maintained an extensive water management system of water managers selected by their communities, and included a complex system of water measurement over the irrigated delta. These two areas corresponded to self-contained communities, who collectively managed water resources within their boundaries. However, it is important to understand the other dimensions around which manteqas were based with the communities in Khulm before making this call definitively.

Overall, the mirab system remains the most robust and active form of water management in Khulm District, and much of northern Afghanistan. While the system needs a great amount of additional support to both better support rural agricultural communities, and act as effective peace-building mechanism, it is the perhaps the most functional entry-point for supporting peacebuilding and livelihoods development in rural Afghanistan.



ANNEXES

Annex 1: Canals by length, square inches, and irrigated, unirrigated, and horticulture land

Canal Name	Canal Length (Meters)	Square Inches	Irrigated land (in jeribs)	Unirrigated land (in jeribs)	Horitculture land (in jeribs)
Shash Paikal	200	135	1,000	9,000	0
Nakar Arigh	1,300	20	3,280	2,908	0
Baghat	1,500	96	1,000	1,100	0
Tullagachi	1,800	12	4,470	3,200	0
Tamshuq	2,000	N/A	300	0	50
Gurgab	1,500	N/A	400	30	40
Haji Yaqub	400	N/A	1	0	0
Hai Damulla	350	N/A	30	10	30
Haji Den Mohammad	4,000	N/A	200	20	120
Lamalik	200	N/A	65	5	50
Chall Aiwan	50	135	5,400	3,000	0
Ceert Yangi Arigh	100	81	1,500	2,000	0
Mullah Sultan	70	N/A	0	0	50
Guzar	300	25	600	0	250
Jahan Numa	1,350	N/A	0	0	400
Baghicha-e Khanimullah	2,500	50	1,500	3,000	300
Ebadullah	150	20	6,300	4,200	0
Fizullah	70	12	200	0	0
Chall Aiwan	50	42	200	0	150
Haji Abdul Hamid	400	40	0	1,000	1,000
Ceert	500	N/A	0	0	200
Saighanchi	100	N/A	550	0	150
Ahangari	400	19.5	0	0	400
Qachar	500	670	1,500	4,400	743
Chuchman	200	696	4,320	12,960	200
Teeli	40	40	0	0	1,000
Ming Bashi	90	25	0	0	400
Rahman	50	12	0	0	200
Hassan	50	22	0	0	204
Kandabaghat	400	112	1,350	100	800
Lakoo	800	12	1,680	3,360	334
Qaza Ghuli	500	180	9,540	10,000	0
Chamanaz	50	320	0	0	320
Eangi Arigh	200	30.5	1,800	1,500	0