Research Methodology Note

Water System Mapping Pilot for the Afghanistan Sustained Rural Development Programme (SRDP IV)
AFG1803d
Afghanistan

December 2020
Version 1

AGORA Localised Response Inclusive Recovery Effective Stabilisation

1. Executive Summary

Country of intervention	Afghanistan					
Type of Emergency	X	Natural disaster	X	Conflict		
Type of Crisis	□	Sudden onset	□	Slow onset	X	Protracted
Mandating Body/ Agency	Norwegian Ministry of Foreign Affairs					
Project Code	*02iAHT*					
Overall Research Timeframe *(from research design to final outputs / M&E)*	22/11/2020 to 30/03/2021					
Research Timeframe *Add planned deadlines (for first cycle if more than 1)*	1. Start collect data: 10/12/2020		5. Preliminary presentation: 02/02/2021			
	2. Data collected: 22/12/2020		6. Outputs sent for validation: 01/03/2021			
	3. Data analysed: 10/01/2021		7. Outputs published: 28/03/2021			
	4. Data sent for validation: 01/03/2021		8. Final presentation: 31/03/2021			
Number of assessments	X	Single assessment (one cycle)				
	□	Multi assessment (more than one cycle) *[Describe here the frequency of the cycle]*				
Humanitarian milestones *Specify **what** will the assessment inform and **when*** *e.g. The shelter cluster will use this data to draft its Revised Flash Appeal;*	**Milestone**		**Deadline**			
	□	Donor plan/strategy	_ _/_ _/_ _ _ _			
	□	Inter-cluster plan/strategy	_ _/_ _/_ _ _ _			
	□	Cluster plan/strategy	_ _/_ _/_ _ _ _			
	X	NGO platform plan/strategy	31/01/2021			
	□	Other (Specify):	_ _/_ _/_ _ _ _			
	Audience type		**Dissemination**			

Audience Type & Dissemination *Specify **who** will the assessment inform and **how** you will disseminate to inform the audience*	X Strategic X Programmatic X Operational □ [Other, Specify]	□ General Product Mailing (e.g. mail to NGO consortium; HCT participants; Donors) □ Cluster Mailing (Education, Shelter and WASH) and presentation of findings at next cluster meeting X Presentation of findings (e.g. at HCT meeting; Cluster meeting) □ Website Dissemination (Relief Web & REACH Resource Centre) □ [Other, Specify]
Detailed dissemination plan required	□ Yes	X No
General Objective	To inform Sustained Rural Development Programme Phase IV (SRDP IV) programming by building an understanding of local water management systems[1] and their relationship to land use, community leadership structures, water management methodologies in Khulm District Balkh Province, in order to inform a larger study of districts in Balkh, Faryab, Jawzjan, and Samangan Provinces, which will occur in September 2020 with the beginning of the SRDP V programme.	
Specific Objective(s)	1. Define and map the rivers, canals, dams, and related infrstructure that make up Khulm district's water system. 2. Understand how water is managed in Khulm District, who manages the water systems, and how they are selected and work as a system. 3. Understand how water is distributed and allocated by existing water management structures, and the related decision-making process. 4. Describe how the water system is maintained, and identify the roles and responsibilities for each member of the water management system. 5. Document which land is supported by irrigation from the water management system, and understand how productive land is in terms of agricultural output.	
Research Questions	1. What are the rivers, canals, dams and related infrastructure that make up the District's water system? 2. Who manages the water system? 3. What structures (physical and institutional) are in place to help manage the water systems? 4. How is water distributed and allocated by the canal system? 5. How is the water system maintained? 6. Who is reponsible for maintenance? 7. What land is supported by the irrigation system? 8. How productive is the land in terms of agricultural output?	
Geographic Coverage	Khulm District in Balkh Province	
Secondary data sources	· Balkh Socio-Demographic and Economic Survey, Central Statistics Organization of Afghanistan, 2016 · Balkh's Economy in Transition, Afghanistan Research and Evaluation Unit, 2013 · Social Water Management in Faryab: A Manteqas Case Study, ACTED, 2016 *(unpublished)* · Helpdesk Research Report: The impact of Area Based Programming, 2011	

[1] Local water management systems are systems designed to manage and distribute water, typically for agriculture. These are often colloquially known as, "mirab" systems, after the main water user manager who maintains the system.

	· Humanitarian response to urban crises: A review of area-based approaches, 2015 · Implementing area-based approaches (ABAs) in urban post-disaster contexts, 2012 · Interface between State and Society in Afghanistan, 2005 · Les "Manteqas": Le Puzzle Souterrain de l'Afghanistan, *1994 (unpublished)* · Local Shura, Security and Development in Afghanistan, 2006 · Subnational State-Building in Afghanistan, 2008 · War and Boundaries in Afghanistan: Significant and Relativity of Local and Social Boundaries, 2001 · "Where is the Village?" Local Perceptions and Development Approaches in Kunduz Province, 2007 · Beyond kinship and tribe: New forms of solidarity and interest representation, 2016 · AGORA, SRDP IV Executive Summary, December 2019 · AGORA, Manteqa Profiles, Samangan Province, August 2019 · AGORA, Manteqa Profiles, Faryab Province: Part 1, August 2019 · AGORA, Manteqa Profiles, Faryab Province: Part 2, August 2019 · AGORA, Manteqa Profiles, Balkh Province, August 2019 · AGORA, Manteqa Profiles, Jawzjan Province, August 2019 · AGORA, SRDP IV District Water User Group Mapping, December 2019

Population(s) *Select all that apply*	□	IDPs in camp	□	IDPs in informal sites
	□	IDPs in host communities	□	IDPs [Other, Specify]
	□	Refugees in camp	□	Refugees in informal sites
	□	Refugees in host communities	□	Refugees [Other, Specify]
	X	Host communities	X	Other (wider populations that use/benefit from these services/systems in place [2]

Stratification *Select type(s) and enter number of strata*	X	Geographical #: 1 District Khulm District Population size per strata is known? X Yes □ No	□	Group #: _ _ _ Population size per strata is known? □ Yes □ No	□	*[Other Specify]* #: _ _ Population size per strata is known? □ Yes □ No

Data collection tool(s)	X	Structured (Quantitative)	**X**	Semi-structured (Qualitative)

	Sampling method	**Data collection method**
Semi-structured data collection tool (s) # 1 *Select sampling and data collection method and specify target # interviews*	**X Purposive** □ Snowballing □ [Other, Specify]	**X Key informant interview (Target #): 34[3]** □ Individual interview (Target #):_ _ _ _ _ □ Focus group discussion (Target #):_ _ _ _ □ [Other, Specify] (Target #):_ _ _ _ _
Semi-structured data collection tool (s) # 2 *Select sampling and data collection method and specify target # interviews*	**X Purposive** □ Snowballing □ [Other, Specify]	□ Key informant interview (Target #):_ _ _ _ □ Individual interview (Target #):_ _ _ _ _ **X Focus group discussion (Target #): 8[4]** □ [Other, Specify] (Target #):_ _ _ _ _

[2] The assessment aims to better understand the Water Management Structures in place, thus, the population group may be the broader community.
[3] A secondary literature review, including a meeting with the local Department of Energy and Water (DEW) in Khulm District, identified 34 canals in Khulm district.
[4] Focus groups were determined by breaking up the Khulm canal system into 3 broad areas; the east canals, west canals, and canals up the river before the river reaches the delta in Khulm and breaks into the two branches. 2-3 interviews per strata were used to ensure robustness of findings. There were 4-6 participants per group.

Target level of precision if probability sampling	_ _% level of confidence **– N/A**			_ _+/- % margin of error **– N/A**		
Data management platform(s)	X	IMPACT		□	UNHCR	
	□	[Other, Specify]				
Expected ouput type(s)	□	Situation overview #: _ _	X	Report #: 1	□	Profile #: _ _
	X	Presentation (Preliminary findings) #: 1	□	Presentation (Final) #: _ _	□	Factsheet #: _ _
	□	Interactive dashboard #:_	□	Webmap #: _ _	X	Map #: 1
	X	Database #: 1				
Access	X	Public (maps available on AGORA website and other humanitarian platforms)				
	□	Restricted (bilateral dissemination only upon agreed dissemination list, no publication on REACH or other platforms)				
Visibility *Specify which* ***logos*** *should be on outputs*	***AGORA***					
	Donor: *Norwegian Ministry of Foreign Affairs*					
	Coordination Framework: *SRDP IV Stakeholders*					
	Partners: *IMPACT, ACTED*					

2. Rationale

2.1. Rationale

The people of Afghanistan have been affected by conflict for approximately 40 years, as well as being affected by drought, flooding, and other natural disasters intermittently over the years. Within this context, the Norwegian Ministry of Foreign Affairs (NMoFA) funded SRDP IV Project, which has been designed to better support economic development, public service access, and understanding the functioning and administration of water services in the province. The project more broadly is intended to address the root causes of instability and poverty in Faryab, Jawzjan, Balkh, and Samangan provinces by creating 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.[5]

Between 2018 and 2019, REACH conducted an in-depth exploration into manteqas in the four target districts in northern Afghanistan.[6] This research sought to directly understand the boundaries of communities, and then followed up with an in-depth profiling of each manteqa's infrastructure, service access, and stakeholders. The assessment provided a detailed study on the manteqas themselves, but lacked sufficient evidence to suggest how the manteqa boundaries were established, what physical infrastructure they were based upon or how they might have formed. Some scholars have noted that manteqa boundaries tend to be based around shared water resources, particularly for the purposes of farming and irrigation.[7] Previous research by ACTED has also noted that other water infrastructure tended to be organized at the communal level, and often reflect other shared resources and community structures as well.[8]

While REACH conducted a detailed mapping of water management structures across all 25 provinces of intervention by the SRDP IV Project, this mapping was surface level, and 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 community.[9] REACH is well-positioned to conduct this research through its ongoing AGORA projects in northern Afghanistan, where it has worked with ACTED to provide a understanding of community structure and resource management to inform ACTED's programming. By better understanding how these water systems work, REACH will be able to build a deeper understanding of the manteqa's

[5] 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).
[6] AGORA, Manteqa Development Plans, December 2019
[7] Roussel, "Constraints and perspectives in the present context for the elaboration of an immediate rehabilitation strategy of the Afghan rural areas," UNORSA, June 1993.
[8] Social Water Management in Faryab: A Manteqas Case Study, ACTED, 2016
[9] AGORA, SRDP IV District Water User Group Mapping, December 2019

relationship with local water systems, how they function, and more broadly, how key resources are managed at a community level and how this is related to the broader relationship with the manteqa which will help provide a better understanding of how ACTED and other partners can engage with local communities on development projects.

3. Methodology

3.1. Methodology overview

The assessment aims to understanding how water systems work, and how they relate to the broader community. The methodology for this project builds on the previous Water User Group Mapping conducted in December 2019. This will be done using two separate tools, and carried out between 10 – 22 December 2020 in Khulm District, Balkh Province. The assessment will comprise a quantitative and qualitative, using both a KII tool and an FGD tool, itemized below as follows:

1) A Key Informant Interview (KII) Tool with Canal Water Managers, and
2) Focus Group Discussions (FGDs) with Water Association members divided between different geographic areas in the district.

In total, 34 KIIs and 8 Focus Group Discussions involving 32-40 Water User Association (WUA) Members will be conducted. Three REACH experienced enumerators will be hired for this pilot assessment. The enumerators will conduct the Key Informant Interviews which will also involve a participatory mapping exercise. One Research Specialist will coordinate the field work, as well as conduct the eight FGDs with the support of one Enumerator acting as a facilitator. In order to ensure consistent and reliable data, enumerators will participate in a preliminary training prior to data collection. The training will occur between 7-9 December 2020. All data collection will involve 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.[10]

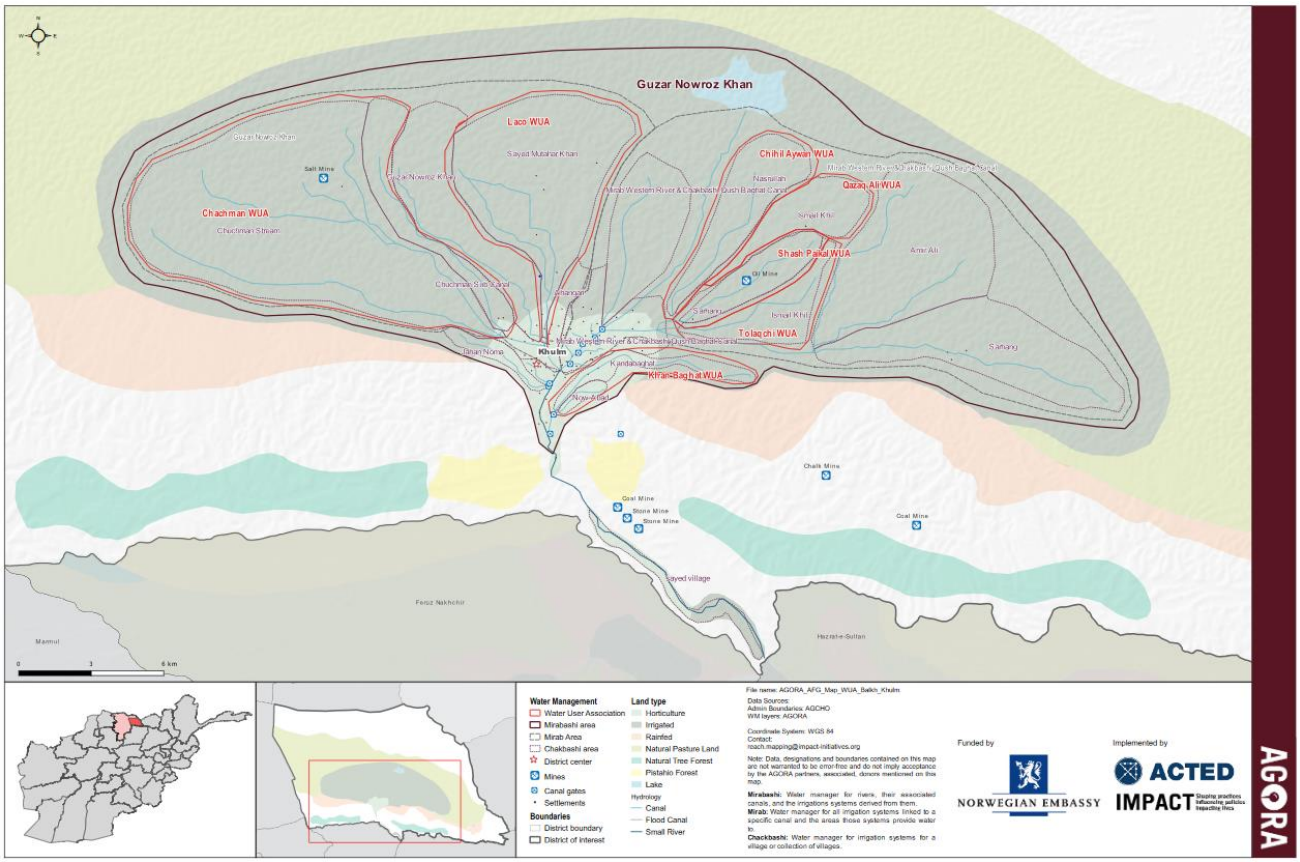
3.2. Population of interest

The pilot assessment will be undertaken in Khulm District, Balkh Province, which is part of the SRDP IV programme and is currently deemed accessible by ACTED programme teams.[11] The district was selected for this pilot due to its accessibility and simple water structure,[12] as well as the availability of the REACH Mazar Data Unit to support the enumerators and the Research Specialist during data collection, processing, and analysis.

The assessment will target those actors at the community levels in the Khulm district of interest that have specific, expert knowledge about water infrastructure, resources, and organization, and land type and usage. At district level, there are specific government staff that the ACTED Sustained Rural Development Programme – Phase IV team is already in contact with in the Department of Energy and Water (DEW), which provided the Research Specialist with the lists of names and contacts of the mirabs, chakbashis, and Water User Association members to interview as KIs and FGD participants. At the community level, this means interviewing the chakbashis, and engage them in active discussions about the functioning of the canal system and water management. A map of the district and its associated areas, known canals, and land types are shown below:

[10] REACH, SOPs for Data Collection during COVID-19,May 2018.
[11] The DLL 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.
[12] The district features a single river from which all canals are connected to, making it very easy to map and identify and focus on the entire water system.

Map 1: Canals and Water User Association boundaries in Khulm District, December 2019



3.3. Secondary data review

A review has been conducted of secondary provincial-level and, in a few cases, district level data on water user structures and livelihoods in Northern Afghanistan. A secondary data review has also been undertaken on area-based approaches globally and specifically in Afghanistan. The review involved reports and assessments from previous AGORA assessments (SRDP IV,[13,14] Mantega Development Plans[15]), ACTED's Social Water management in Faryab case study, engineering maps of the water system created by ACTED, and on 10 December, contact lists of water managers in Khulm were obtained from the District Department of Water and Energy in Khulm, international organisations (e.g. the United Nations), non-governmental organisations, and academic institutions.

3.4. Primary Data Collection

Data collection, as noted above, will involve both quantitative KIIs and Qualitative FGDs. The exact methodologies for each are detailed in this section below.

Focus Group Discussions:

Water User Association Members are to be purposively selected to be interviewed as FGD participants due to their familiarity with the structure, the system, and its administration, and in order to better capture their perspective on this specific topic through participatory discussion. While in previous assessments disaggregation by gender was possible, in this assessment all KIs are expected to be all male, and will therefore not allow such analysis.

Through the eight FGDs conducted with the members of Water User Associations,[16] the assessment will aim better understand issues surrounding the management structures that manage water resources, as well as how water

[13] AGORA, SRDP IV District Water User Group Mapping, December 2019
[14] AGORA, SRDP IV Executive Summary, December 2019
[15] AGORA, Mantega Development Plans, December 2019
[16] The Water User Associations is a membership including water managers, including the mirabs, as well as water users, including farmers and agricultural specialists.

management works, how managers are found and recruited, and how the process is structured. These interviews will be conducted directly by the Research Specialist and an Enumerator, and be divided into eight groups over three areas, based on the overall architecture of the canal system:

1. 3 FGDs in the East Canal
2. 2 FGDs in the West Canal
3. 3 FGDs in the canals that branch from the main Khulm River (before the river divides into the East and West Canals)

Each focus group will involve 4-5 respondents, and be conducted within ACTED's office in Khulm. These are smaller groups than usual, in order to mitigate the risk of COVID-19 in Afghanistan. These interviews will be recorded with pen and paper, and be open ended. Details on the discussions are provided in the table below:

Table 1: Focus Group Discussion Interview Schedule (Tentative), December 2020

No	Institution name	Location of FGDs	Number of Respondents	Date	Time	
1	Mirab /Mirabshi/ Members of WUAs/AUGs	ACTED office Khulm	4-5	13 December	9:30 am	3 FGDs in the East Canal
2			4-5	14 December	9:30 am	
3			4-5	15 December	9:30 am	
4			4-5	16 December	9:30 am	2 FGDs in the West Canal
5			4-5	17 December	9:30 am	
6			4-5	12 December	9:30 am	3 FGDs in the Canals located above then the East and West Canals
7			4-5	20 December	9:30 am	
8			4-5	22 December	9:30 am	

Key Informant Interviews:

KIIs will be conducted with the canal water managers (referred to locally as mirabs or chakbashis). There are 34 canals in Khulm district, each with two mirabs or chakbashis,. REACH will interview one of the chakbashis for each canal, for a total of 34 KIIs. These interviews will use a purposive sampling methodology, specifically targeting water managers with specific information on each canal. These interview will be quantitative in nature, with specific, semi-structured questions per canal, though as the assessment is a pilot, they will be done with pen and paper tools, which will be used to help inform the response options for a quantitative tool that will be used during the main assessment. The tools will cover the canal attributes, maintenance, and land that the water is used to support (particularly in the way of agriculture). Each KII will also include a participatory mapping component, where the canal systems and their associated infrastructure are mapped onto a detailed map of the district created using satellite imagery. Each interview should take about 1 hour. Enumerators are expected to conduct two interviews per day.

Both the water managers and WUA members will be mobilized through contact lists that the ACTED Khulm staff have constructed. If additional members need to be located, ACTED will work with DEW to identify and locate them through snowball sampling.

A total of 34 KIIs will be conducted with one of the two chakbashis for each of the 34 canals in Khulm District. The KII tool entails a participatory mapping component. Teams should use the **same map** if possible in order to ensure that when the land types are drawn, they are consistent with the water infrastructure. However, maps of different scale were used to ensure greater detail when mapping in urban areas.

3.5. Data Processing & Analysis

Geospatial data will be analysed by the GIS team, who will synthesize the data from multiple drawn maps into a single map. The data will then be digitised by the GIS team and maps will be produced of both the infrastructure and land type data. Additional data collected in the Focus Group Discussions will be transcribed and entered into an excel database for each district.

Data from the KIIs will be transcribed into a database. As any response is allowed and written down, they will need to be also cleaned. This cleaning process will harmonize the responses into definable categorical, ordinal, and interval variables which can be compared, into a similar format to a Kobo dataset. These responses will then be analysed as in excel (using pivot tables).

Responses from the FGDs will be entered and analysed using a data saturation grid, in which all key indicators from the questionnaire that were designed to answer the project research questions will be noted, and for each interview, marked if they were present or not. The number of interviews where the key indicator was covered will be added up. Key findings for each point will be noted next to each point to provide the key findings for each indicator, summarizing all key findings. A data analysis plan with the questionnaire is available under Section 6 below.

4. Roles and responsibilities

Table 2: Description of roles and responsibilities

Task Description	*Responsible*	*Accountable*	*Consulted*	*Informed*
Research design	Assessment Manager	Assessment Manager	ACTED DLL, IMPACT HQ (RDDU), Country Coordinator	ACTED Global
Supervising data collection	Research Specialist	Assessment Manager	Country Coordinator	ACTED DLL
Data processing (checking, cleaning)	Research Specialist	Assessment Manager	IMPACT HQ (RDDU)	Country Coordinator
Data analysis	Research Specialist, GIS Officer	Assessment Manager	IMPACT HQ (RDDU)	Country Coordinator
Output production	Research Specialist	GIS Manager, RS	Assessment Manager, IMPACT HQ (RRU)	Country Coordinator
Dissemination	Assessment Manager	Country Coordinator	ACTED DLL	IMPACT HQ, ACTED Global
Monitoring & Evaluation	Assessment Manager	Country Coordinator	IMPACT HQ (RDDU)	ACTED Global, ACTED DLL

Lessons learned	Assessment Manager	Country Coordinator	IMPACT HQ (RDDU and RRU)	ACTED Global, ACTED DLL

Responsible: *the person(s) who executes the task*

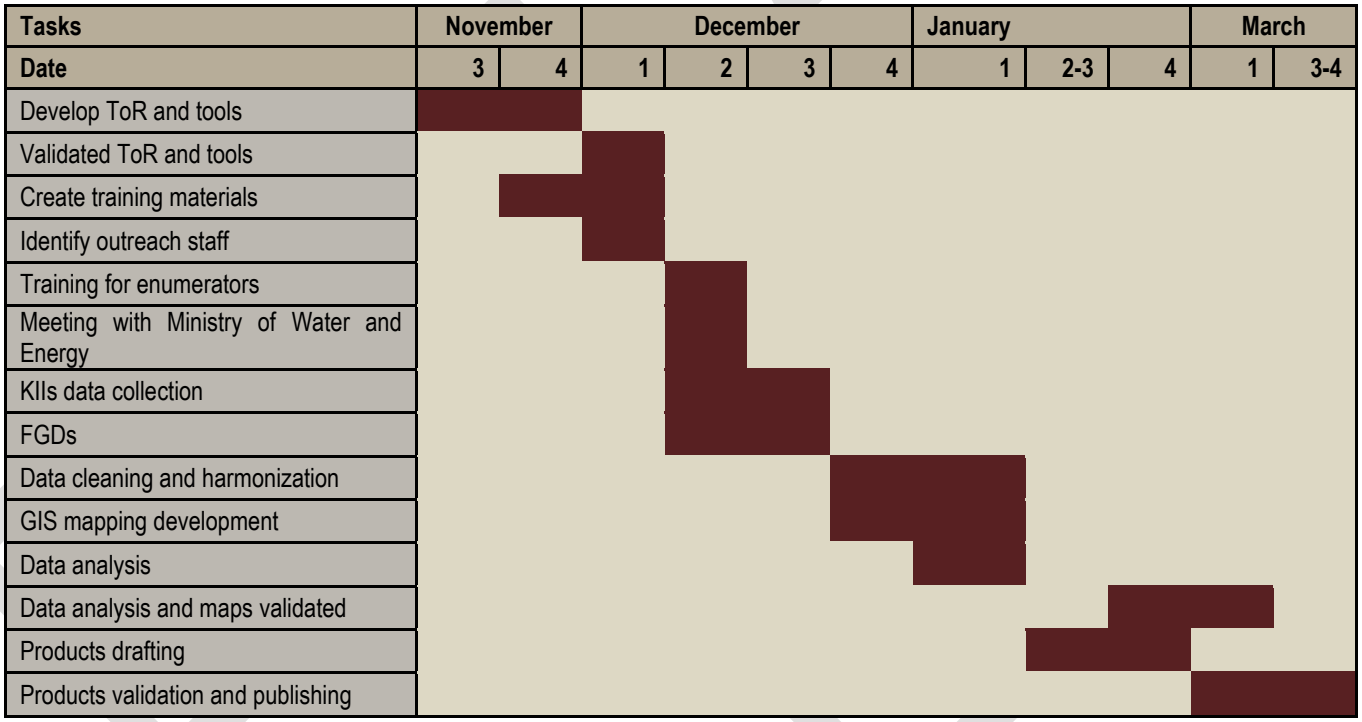
Accountable: *the person who validates the completion of the task and is accountable of the final output or milestone*

Consulted: *the person(s) who must be consulted when the task is implemented*

Informed: *the person(s) who need to be informed when the task is completed*

5. Timeline

The following tentative timeline has been prepared:



6. Data Analysis Plan

KII tool

Research questions	IN #	Questionnaire Question	Questionnaire Responses	Data collection method	Data collection level
What are the Rivers, Canals, and Dams and related infrastructure that make up the District's water system	**A.1.1**	What is the name of the canal	Text	Key Informant Interview	Canal
	A.1.2	Write the formal name of the river on the map	Text	Key Informant Interview	Canal
	A.1.3	Please write any additional informal names of the river and background information	Text	Key Informant Interview	Canal
	A.1.4	What rivers des this river connect to?	Text	Key Informant Interview	Canal
	A.1.5	What rivers des this river connect to?	Text	Key Informant Interview	Canal
	A.1.6	What rivers des this river connect to? Name them	Text	Key Informant Interview	Canal
	A.1.7	What is the length fo the rive (provide unit of measurement)	Text	Key Informant Interview	Canal
	A.1.8	What district does the river pass through?		Key Informant Interview	Canal
	A.1.9	Do people in the districts use water from the river?		Key Informant Interview	Canal

	A.2.1	What manteqas does the river pass through?		Key Informant Interview	Canal
		Do people in the manteqas use the water?		Key Informant Interview	Canal
	A.2.2	How many Canals does the river serve in that district?	integer	Key Informant Interview	Canal
	A.2.3	Name the canals	text		Canal
	A.2.4	Draw and label the canal on the map	mapping		Canal
	A.2.5	Length of Canal		Key Informant Interview	Canal
	A.2.6	Name of qaryas served by each canal		Key Informant Interview	Canal
	A.2.7	Ethnicities per in each canal		Key Informant Interview	Canal
	A.2.8	Canal Abgardan is concreted?	yes	Key Informant Interview	Canal
			no		
	A.2.9	Canal has a gate	yes	Key Informant Interview	Canal
			no		
	A.3.1	Seasonality	winter	Key Informant Interview	Canal
			spring		
			summer		
			fall		
	A.3.2	Is the canal not fully functional or need repairs?	yes	Key Informant Interview	Canal
			no		

	A.3.3	What repairs or imprements are needed?	Text	Key Informant Interview	Canal
	A.3.4	Note the exact locations where they are needed, in terms of the qarya, on the map	Mapping	Key Informant Interview	Canal
	A.3.5	Do they need to concrete the abgarden?	yes	Key Informant Interview	Canal
			no		
	A.3.6	Do they need to install a gate to control the water?	yes	Key Informant Interview	Canal
			no		
	A.3.7	Do they need to construct aqueducts?	yes	Key Informant Interview	Canal
			no		
	A.3.8	How many aqueducts are needed?	integer	Key Informant Interview	Canal
	A.3.9	Where will they go? (qaryas)	text	Key Informant Interview	Canal
	A.4.1	Do they need to contruct retaining walls	yes	Key Informant Interview	Canal
			no		
	A.4.2	How many retaining walls need to be constructed	integer	Key Informant Interview	Canal
	A.4.3	What else is needed	text	Key Informant Interview	Canal

	A.4.4	Are there any dams in the river or canals that are used to control water?	yes	Key Informant Interview	Canal
			no		
	A.4.5	Name of the dam	text	Key Informant Interview	Canal
	A.4.6	Dam location (by nearest qaryas)	text	Canal	Canal
	A.4.7	Map and label on map	mapping	Canal	Canal
	A.4.8	Funcationality of each dam	functional	Key Informant Interview	Canal
			partially functional		
			not functional		
	A.4.9	Are there any water management institutions or offiices that help manage the maintenance or construction of rivers, canals, or dams for this canal?	yes	Key Informant Interview	Canal
			no		

	A.5.1	Which offices are there? (answer for each river, canal, and dam)	note	Key Informant Interview	Canal
	A.5.2	Directorate of Energey and water (DEW)	yes	Key Informant Interview	Canal
			no		
		MRRD	yes		
			no		
	A.5.3	Water User Association/Water User Group	yes	Key Informant Interview	Canal
			no		
	A.5.4	Mirab/Mirbashi/Chakbashi system	yes	Key Informant Interview	Canal
			no		
	A.5.5	Other	yes	Key Informant Interview	Canal
			no		
	A.5.6	Specity Other	Text	Key Informant Interview	Canal
Who manages the water and what structures are in place to help manage the water systems?	**B.1.1**	For each River and Canal, please note if tehre is any wate rmanager of any kind (mirbashi, chakbashi, mirab, satgar, etc.) for that River or Canal.	text	Key Informant Interview	Canal

	B.1.2	Is the manger official or personal/unofficial?	official	Key Informant Interview	Canal
	B.1.3		personal/unofficial	Key Informant Interview	Canal
	B.1.4	What is their phone number?	integer	Key Informant Interview	Canal
	B.1.5	Mark the area that they manage on the map	Map	Key Informant Interview	Canal
	B.1.6	How many water use groups are there for the river?	integer	Key Informant Interview	Canal
	B.1.7	White the name of each WUG	text	Key Informant Interview	Canal
	B.1.8	Write the name of key member 1	text	Key Informant Interview	Canal
	B.1.9	Write the phoen number of key member 1	integer	Key Informant Interview	Canal
	B.2.1	Write the name of key member 2	text	Key Informant Interview	Canal
	B.2.2	Write the phoen number of key member 2	integer	Key Informant Interview	Canal
	B.2.3	Write the name of key member 3	text	Key Informant Interview	Canal
	B.2.4	Write the phoen number of key member 3	integer	Key Informant Interview	Canal
	B.2.5	Write the name of key member 4	text	Key Informant Interview	Canal
	B.2.6	Write the phoen number of key member 4	integer	Key Informant Interview	Canal
	B.2.7	What manteqas does the group mange water for?	Text	Key Informant Interview	Canal
	B.2.8	What qaryas doe the group manage water for?	Text	Key Informant Interview	Canal

	B.2.9	How many water use associations manage water for the river?	integer	Key Informant Interview	Canal
	B.3.1	Write the name of each Water Usear association	Text	Key Informant Interview	Canal
	B.3.2	Write the name of key member 1	text	Key Informant Interview	Canal
	B.3.3	Write the phoen number of key member 1	integer	Key Informant Interview	Canal
	B.3.4	Write the name of key member 2	text	Key Informant Interview	Canal
	B.3.5	Write the phoen number of key member 2	integer	Key Informant Interview	Canal
	B.3.6	Write the name of key member 3	text	Key Informant Interview	Canal
	B.3.7	Write the phoen number of key member 3	integer	Key Informant Interview	Canal
	B.3.8	Write the name of key member 4	text	Key Informant Interview	Canal
	B.3.9	Write the phoen number of key member 4	integer	Key Informant Interview	Canal
	B.4.1	Mark and label the areas the WUA manages on the map	mapping	Key Informant Interview	Canal
	B.4.2	What matneqas do they pass through	text	Key Informant Interview	Canal
	B.4.3	What qaryas does the association manage water for?	text	Key Informant Interview	Canal

How is water distributed and allocated by the canal system?	**C.1.1**	How much water does each canal use (measured in paw)	integer	Key Informant Interview	Canal
How is the water system maintained and who is reponsible for mantenance?	**D.1.1**	Which water managers have a formal or informal responsibility to maintain the canal?	note	Key Informant Interview	Canal
	D.1.2	Mirab/Mirbashi/Chakbashi system	yes	Key Informant Interview	Canal
			no		
	D.1.3	Water User Group	yes	Key Informant Interview	Canal
			no		
	D.1.4	Water User Association	yes	Key Informant Interview	Canal
			no		
	D.1.5	Water and Energey Directorate?	yes	Key Informant Interview	Canal
			no		
	D.1.6	Anyone else?	yes	Key Informant Interview	Canal
			no		
	D.1.7	specify other	text	Key Informant Interview	Canal
	D.1.8	What types of mantenance is typically performed, if any?	text	Key Informant Interview	Canal

What land is supported by the irrigation system, and how productive is the land in terms of agricultrual output?	**D.1.9**	How many jiribs of land is irrigated by the canal?	integer	Key Informant Interview	Canal
	D.2.1	Mark the irrigated areas on the map	mapping	Key Informant Interview	Canal
	D.2.2	How many jiribs of land remian unirrigated in the area of the canal?	integer	Key Informant Interview	Canal
	D.2.3	Mark the unirrigated areas on the map	mapping	Key Informant Interview	Canal
	D.2.4	During what months is the irrigated land irrigated with water?	months	Key Informant Interview	Canal
	D.2.5	What are the main crops ground in the land that is irrigated by the canal? List them all	Text	Key Informant Interview	Canal
	D.2.6	For each crop, provide the number of jiribs in output per crop	integer	Key Informant Interview	Canal
	D.2.7	For each crop, not when the crop is to be harvested in which seaon?	winter	Key Informant Interview	Canal
			spring		
			summer		
			fall		
	D.2.8	What is the price per mann of each crop?	integer	Key Informant Interview	Canal
	D.2.9	How many jiribs of horticulure are iririgated by the canal?	integer	Key Informant Interview	Canal

D.3.1	Mark these areas on the map	mapping	Key Informant Interview	Canal
D.3.2	What fruit tree types are grown?	Text	Key Informant Interview	Canal
D.3.3	How many kg of fruits are produced each year?	integer	Key Informant Interview	Canal
D.3.4	what season are they harvested in?	winter spring summer fall	Key Informant Interview	Canal
D.3.5	Are taxes paid for the crops?	yes no	Key Informant Interview	Canal
D.3.6	How are the taxes paid?	text	Key Informant Interview	Canal
D.3.7	How much taxes are paid on avereage per jirib or season?	text	Key Informant Interview	Canal

FGD Tool

Research questions	Q#	Sub-research Question	Sub-research question group	Questionnaire QUESTION	Probes
What are the Rivers, Canals, and Dams and related infrastructure that make up the District's water system	A.1	What water infrastructure is present?	Irrigation canals and dams	What happened that caused the canal to be damaged? (examples include erosion, lack of maintenance, or	

				destroyed, if yes, how and by whom, etc.)	
				Is there any dame explain it (its historical background, its construction, its current condition, how it was constructed, etc.).	
				Is there any dame that is not fully functioning or needed some repairs? What kind of repairs / improvements are needed? (Please note the exact locations where they are needed, in terms of the Qarya)	
				How the irrigation system affects when the areas exchange between the Afghan government and the AoG?	
Who manages the water and what structures are in place to help manage the water systems?	B.1	How is the water system managed?	Irrigation water management	Please describe how the mirab system in your area was established, including the history, how the system works, and any other systems that have been used to manage	*When and how was the mirab system established?*
					How and why was this system chosen to manage water?
					How was the mirab system established?

				water in the area in the past.	Has this system changed over time? What existed before (describe the system and how it worked)? If yes, how and what got changed in this system?
				Are the number of the mirab/s is fixed for each canal or they changed over the time?	Why were the number of water managers changed?
				How are mirab selected or elected (Provide examples if possible)	
				Are water managers paid? How is the payment determined?	
				5. What is the chain of command like? Is it: mirab bashi > mirab > chak bashi > satgar? What are the roles and responsibilities of each one? Are any roles not present in some areas? Why?	
				What are the differences between the official personal or unofficial mirabs?	Is selection different? How so?

					Are roles and responsibilities different? How so?
					Is payment different? How so?
					Are there any other differences?
				7. Are traditional water managers (mirabs, etc.) also part of or work with WUGs and WUA? How does the relationship work?	
				8. How does the mirab fit within traditional qarya leadership, including arbabs/maliks/etc. , malims, and other qarya leadership?	
				9. Is the mirab system part of the official government agencies, like DEW or MRRD? How do they work together? Is there any relationship?	
				10. What is the role of the Water User Groups in irrigation water management	
				11. what is the role of the Water Associations in irrigation water management?	

				12. Does the mirab system work effectively? Are there any ways that it could be improved? (includes capacity building, trainings, equipment, construction, changes in staffing, etc.)	
How is water distributed and allocated by the canal system?	C.1	How is water allocated for each canal?	Water distribution and allocation	1. What is the basis for water allocation for each canal in each river?	
				2. What is the basis for water allocation within each canal? How is it divided among water uses or qaryas?	
				3. Has the way that water is allocated or distributed ever changed? Why was it changed, and when did the changes happen? How was the system changed?	
				4. What are the main current issues / disputes on water distribution or allocation?	
				5. How these issues are resolved?	
				6. Are there issues that remained unsolved for long time? Why they are still unresolved?	
How is the water system maintained and who is	D.1	How do water managers maintain the water systems	Maintenance	How is the irrigation water system maintained? (Traditionally or formally)?	

responsible for maintenance?				2. Explain the role of the mirab in the maintenance of the irrigation water sources or precisely canals?	
				3. Explain the Water User Association in the maintenance of the irrigation water sources, or precisely canals?	
				4. Explain the role of the Directorate of the Energy and Water in the maintenance of the irrigation water sources or precisely canals?	
What land is supported by the irrigation system, and how productive is the land in terms of agricultural output?	E.1	How is the water system linked to land ownership and productive industries?	Socio-economic importance	1. How do the growing, production, and output of agricultural products rely on the water network?	1.
				2. Is this production also communally managed? If so, how?	
				3. How is land managed or administered? (collective, small individual holdings, large holdings from landowners).	
				4. Explore value chains of key goods if this is the case.	packaging

					shipping
					transporting
					Selling
				How are profits from the growing divided (sharecropping system)? Is it communally produced or held by individual land owners?	