PROFILE

Irrigation Management in Saray Qala Manteqa, Faryab

August 2025 | Saray Qala, Faryab Province, Afghanistan

KEY MESSAGES

- Most households reported insufficient irrigation water, with seasonal shortages and mid-season drying of sources seeming to contribute to widespread concern about future availability.
- Irrigation infrastructure was widely reported to be in poor condition, with frequent breakdowns, sediment accumulation, and limited maintenance capacity due to financial and technical constraints.
- Farming systems seem to have come under increasing pressure from environmental and economic stress, as households adapted their practices and sought additional income sources, while evapotranspiration data indicated irrigation activity potentially sustained by increased reliance on borewells in recent dry years.

ASSESSMENT OVERVIEW

This assessment aims to analyze seasonal and year-round patterns of irrigation water use and access, evaluate drivers of variability and scarcity, including climatic and socio-economic pressures, and examine local governance structures and community capacities to inform sustainable irrigation interventions across five manteqas in Northwest Afghanistan.[2] The selected manteqas have been targeted to implement a pilot of Acted's THRIVE initiative to support rangeland restoration in cooperation with local communities.

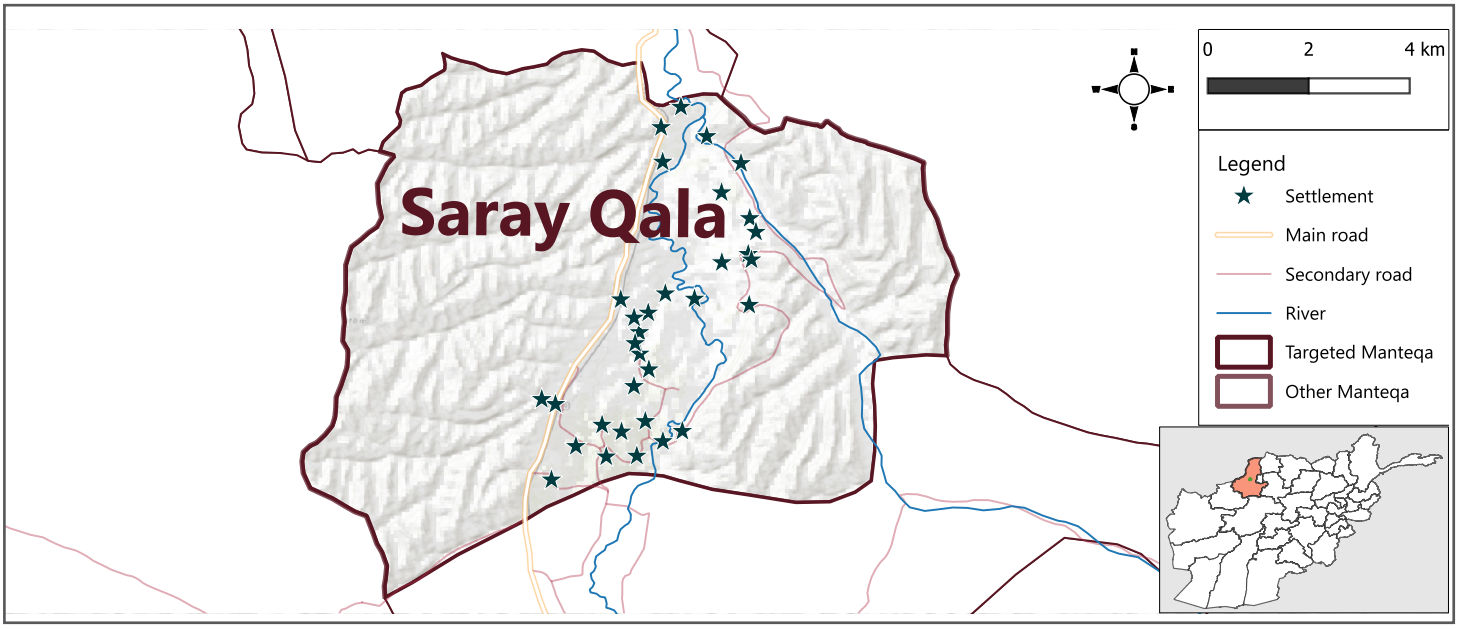
Methodology

The Irrigation Management Research Assessment uses a mixed-methods approach combining a household survey, Key Informant Interviews, and remote sensing indicators to assess irrigation sources, systems, management, and performance in five manteqas in Northwest Afghanistan. Data collection took place between 26 May and 13 June 2025. All findings presented here should be considered indicative. For an overview of the methodology, please see below.

CONTEXT & RATIONALE

The convergence of prolonged environmental stress, socio-economic hardship, and limited institutional capacity has placed rural communities in Northwest Afghanistan under increasing pressure. In areas where livelihoods depend on irrigated agriculture, recurring droughts, declining surface flows, and growing competition over groundwater have intensified vulnerabilities.[1] To support sustainable recovery and resilience-building, the Irrigation Management Assessment aims to generate localized, evidence-based insights into water use, availability, and the governance of irrigation systems. Conducted as part of the Sustainable Rural Development V programme, the assessment seeks to inform programming and prioritization for sustainable irrigation by tracking seasonal patterns and household practices across five manteqas. The inclusion of remote sensing enhances the ability to monitor environmental change and irrigation demand over time and to triangulate these patterns with community-reported data.

Map 1: Saray Qala Manteqa



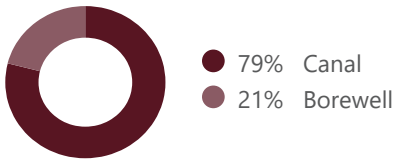
IRRIGATION INFRASTRUCTURE AND COORDINATION

Introduction

Saray Qala is located in Faryab Province, comprising 30 villages with an estimated 10,029 households (74,968 individuals).[3] None of its residents are returnees or Internally Displaced Persons (IDPs).[4] According to a previous assessment, most of Pump Khana's residents rely on agriculture for their livelihoods, and around 20% of its area is considered irrigated land, all of which is located around the manteqa's settlements.[5]

Water sources and infrastructure

Primary irrigation water source (by % of surveyed HH)

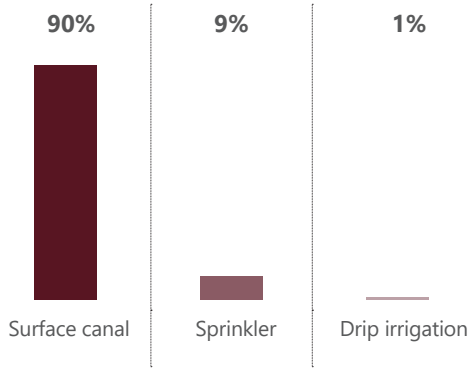


Most surveyed HHs reported drawing irrigation water from canals. Irrigation canals in the region have been described as heavily reliant on snowmelt and rainfall, suggesting that water availability in Saray Qala may be subject to seasonal shifts.[7]

According to KIs, the main irrigation-related infrastructures in the manteqa include water intakes and traditional and modern irrigation canals, fed mostly by rainwater, snow-melt and springs.

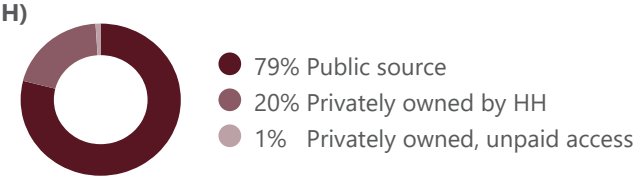
Most surveyed HH pointed to surface canals as their primary irrigation system, although some seem to use sprinklers and drip irrigation systems. The chart below shows the share of households using each irrigation system (multiple responses allowed). This indicates that irrigation practices may involve a mix of water delivery systems, even if based on groundwater extraction.

Irrigation systems used (% of surveyed HH)[6]



Public ownership of water sources in the manteqa seems widespread, although some also reported owning their own water sources, in line with the proportion of HHs reporting boreholes as primary water source.

Reported ownership of water source (% of surveyed HH)

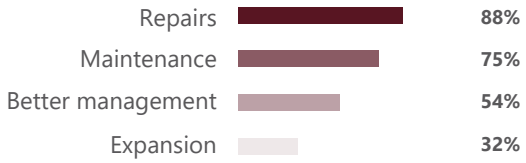


Maintenance of irrigation infrastructure

KIs indicated that existing water infrastructure is maintained through community action and community financial contributions, sometimes with the help of the local government department for irrigation and landowners. Such maintenance includes repairs and regular removal of sediments, and is traditionally coordinated by local water managers.

Surveyed HH reported that irrigation systems in the manteqa could benefit from improvements such as repairs (88%), maintenance (75%), and better management (54%), with only about a third pointing to a need for expansion. These findings may suggest that irrigation infrastructure is broadly sufficient but prone to breakdown.

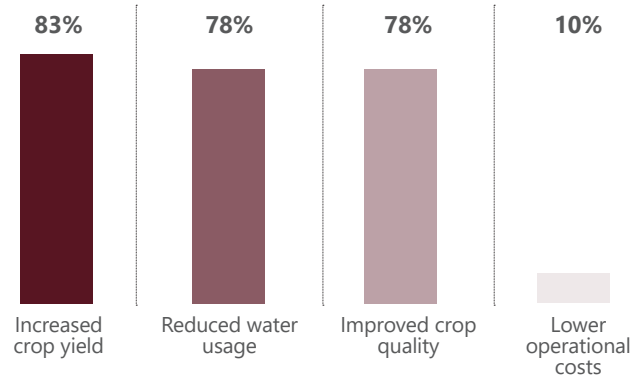
Desired irrigation infrastructure improvements (% of surveyed HH)[6]



KIs echoed the need for repairs and expansion of existing infrastructure, and suggested training for farmers to improve knowledge and reduce water wastage. They also noted frequent breakdowns due to sediment buildup and substandard materials.

Survey results further hint at reasons for these perceived needs, with most respondents pointing to increased crop yield (83%), reduced water usage (78%), improved crop quality (78%) and only few to lower operational costs (10%) as expected outcomes. It seems likely that agricultural outputs are constrained in quality and quantity by existing systems, despite many having access to canal water or borewells, likely as a result of water scarcity.

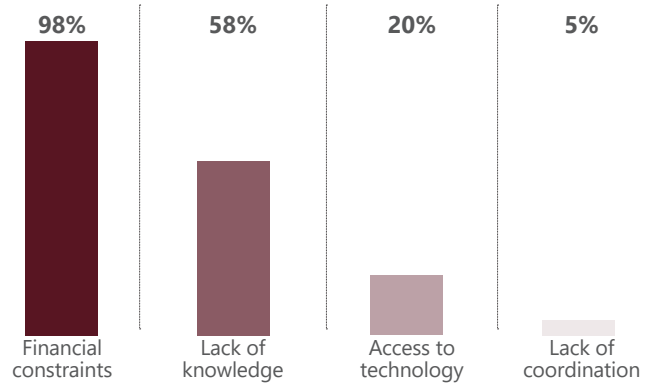
Expected outcomes of the desired irrigation infrastructure improvements in the manteqa (% of surveyed HH)[6]



IRRIGATION INFRASTRUCTURE AND COORDINATION

Barriers to implementing such improvements were overwhelmingly reported as financial (98%). Other reported constraints included a lack of knowledge (58%) and a lack of access to technology (20%), while fewer mentioned insufficient coordination (5%). Based on these findings, agricultural extension services may prove very effective in supporting households to overcome such constraints.

% of HH by reported barriers to implementing improvements to irrigation infrastructure[6]

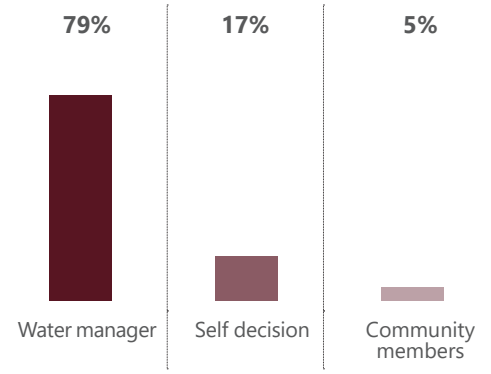


Water allocation and decision-making

Key Informants indicated that decisions around irrigation water in the manteqa are based on customary practices and formal water laws. They described water allocation as depending on land ownership with adjustments made based on seasonal fluctuations of available water, and pointed to infrastructure deterioration and climate trends having seriously affected the availability and variability of water.

In line with this, the majority of surveyed HH (79%) reported consulting water managers on irrigation water use, likely due to their reliance on public water sources. 17% indicated making independent decisions, and even fewer consulting other community members, underscoring the importance of local governance mechanisms for irrigation water management in Saray Qala.

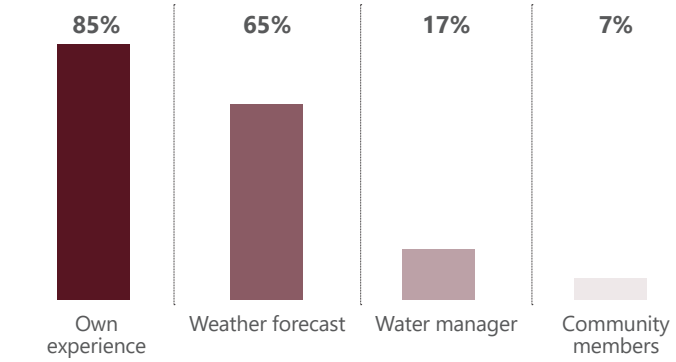
% of surveyed HH that reported consulting other actors for irrigation water use[6]



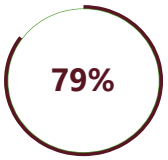
Key Informants highlighted the role of local water managers (*Mirab Bashi)* that engage with communities on irrigation water, both within and across villages.

Most surveyed HH reported relying on their own experience (85%) or learning about the availability of irrigation water at the start of the season from weather forecasts (60%), with only a minority relying on water managers or the advice of other community members. These findings may suggest that own experiences are trusted more than more institutional sources, perhaps due to water allocation being in line with cultivated land area and seasonal availability.

% of surveyed HH by reported information sources for availability of irrigation water at the start of the planting season[6]



Nearly all surveyed HHs reported being concerned about future irrigation water availability.[8] It is likely that already limited resources and declining groundwater levels as well as consecutive droughts have contributed to high levels of concern. Agriculture, the main reported source of income in the manteqa, seems to be an important means of subsistence that may be eroded if irrigation water availability declines.[9]



of surveyed HH reported being very concerned about the availability of irrigation water in the future.

SUMMARY

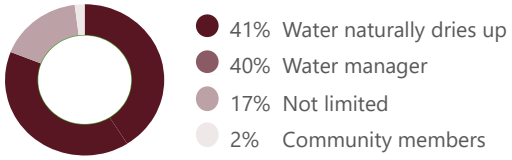
- Canals appear to be the main irrigation source, but borewells are also used, indicating mixed reliance on surface and groundwater.
- Reliance on public water sources is reportedly widespread, with most households coordinating through local water managers.
- Households and KI reported frequent infrastructure breakdowns and prioritize repairs and maintenance over expansion.
- Financial constraints and limited technical knowledge were the main reported barriers to improving irrigation systems.
- Nearly all households expressed concern about future water availability.

WATER AVAILABILITY AND FARMING PRACTICES

Availability of Irrigation Water

A majority of surveyed HHs reported limited availability of irrigation water, either through limits imposed by water managers, or by the water drying up, which may be a regular occurrence due to the manteqa's climate or reflect the impact of drought conditions on water availability.[11] For just under a fifth, irrigation water availability was reportedly not limited, seemingly in line with the prevalence of boreholes drawing from groundwater.

% of surveyed HH by imposed limits on irrigation water

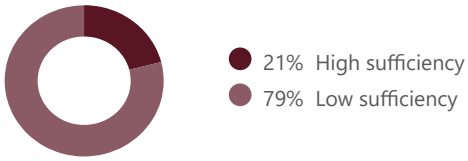


Among those facing restrictions, 62% reported a daily time limit of one hour or less. These limits fall at the lower end of what is common in the region and, given the relatively small land areas cultivated, suggest that irrigation agriculture may be heavily constrained by water availability.

On average, surveyed HH irrigate **6 jerib** on **9 Days** per year[12]

While many households appear able to cultivate under current conditions, shortages and limited predictability still seem to constrain stability. The majority of surveyed HHs seemed to experience low levels of irrigation water sufficiency, while around a fifth experienced high levels, the latter of which may result from groundwater extraction for irrigation purposes.

Aggregated irrigation water sufficiency (% of surveyed HH)

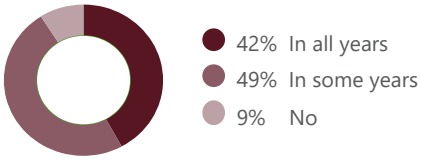


This measure combines household experiences of sufficiency, seasonal variation, duration of shortages, and predictability at planting to reflect the overall stability of irrigation supply.

The majority of households also reported adjusting their farming practices in recent years, with many also diversifying income sources to meet household needs. Reported changes in farming practices seem to be reactive to water scarcity, while reliance on additional off-farm work suggests that agriculture alone may not always provide sufficient income for households.

of surveyed HH reported a change in agricultural activities to secure sufficient income or yield in the past 5 years.

% of surveyed HH that reported taking up additional work due to insufficient farm income in the past 5 years

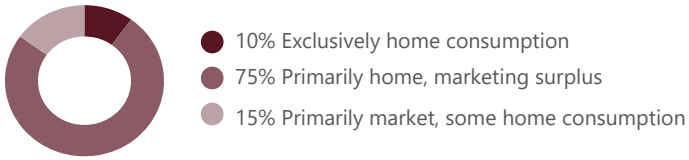


Cropping Patterns and Agricultural Activity

According to findings from an earlier REACH profiling, vegetables, cereals and root vegetables are the most common crops in the manteqa.[10]

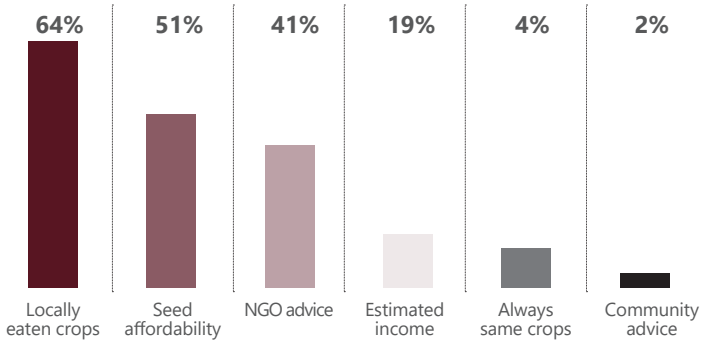
Farming seems to be primarily for household use. While only 10% of the surveyed HH reportedly farmed exclusively for home consumption, 75% indicated products are primarily for home use with surplus sold at markets.

Reasons for farming (% of surveyed HH)



Crop selection appears to be heavily driven by local consumption needs, more so than any other reason reported by HH. A majority also indicated selecting crops based on the affordability of seeds, seemingly in line with the most reported reasons for farming above.

Reasons for crop selection (% of surveyed HH)[6]



WATER AVAILABILITY AND FARMING PRACTICES

Evapotranspiration as an Indicator

Evapotranspiration (ET) is the combined transfer of water from land to the atmosphere through soil evaporation and plant transpiration. It serves as a proxy for crop water demand and thus provides an indication of irrigation pressure across the manteqa.

2021–2022

In Saray Qala, summer ET stayed modest along the irrigated corridor and lower outside it. Peaks were about 4.7 mm in 2021 and 4.5 mm in 2022. Rain in 2022 was below normal at about 188 mm and vegetation was moderate to weak, so irrigation sustained most summer consumption inside serviced parcels while non-irrigated land remained low.[13]

2023

ET weakened relative to 2021–2022 but remained concentrated in the corridor, with peaks near 4.0 mm. Rainfall was about 194 mm and soil moisture fell earlier than the 2016–2022 average, so high values inside the corridor reflected applied water while surrounding fields could not maintain similar use.[14]

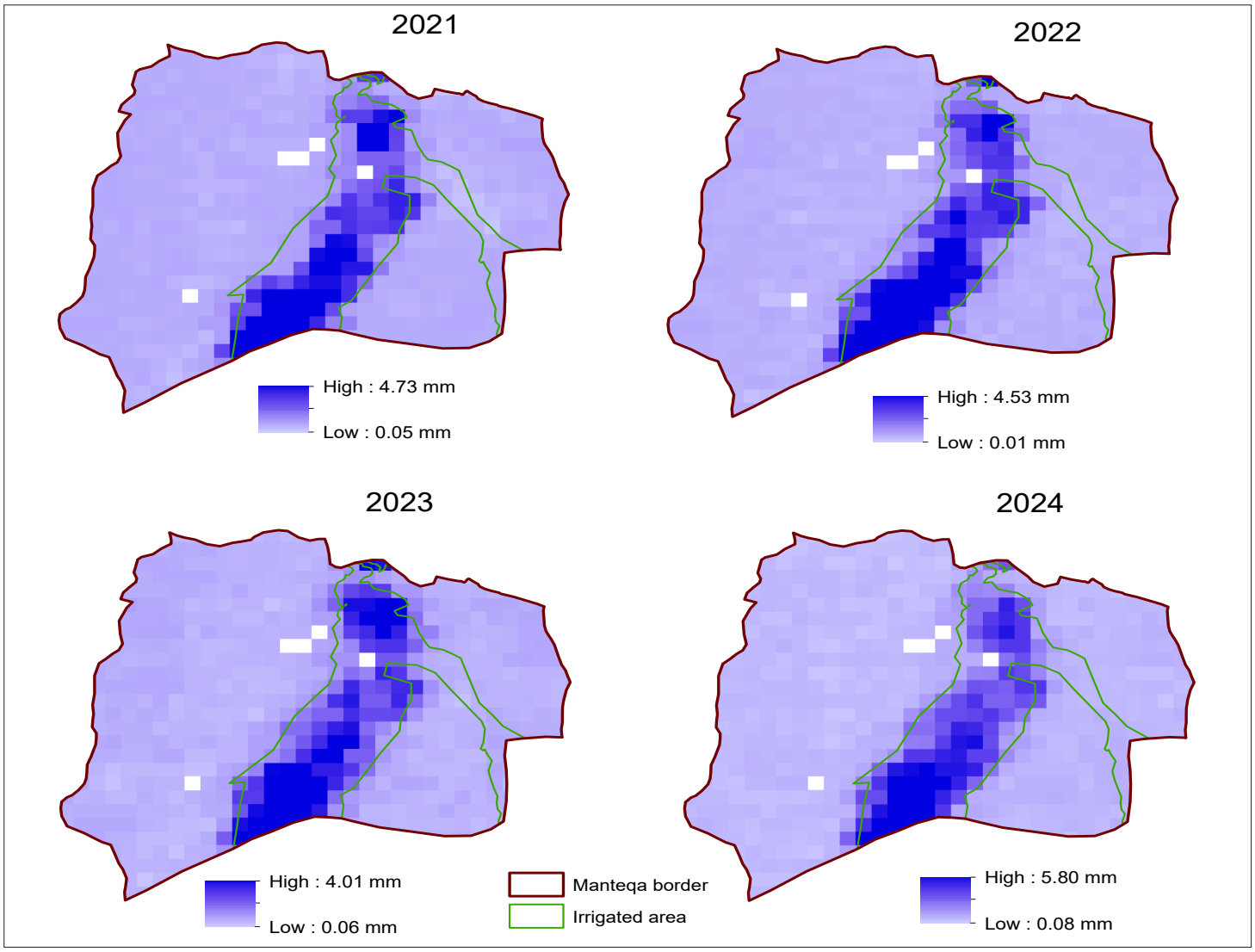
2024

ET strengthened and reached the highest peaks of the period near 5.8 mm, with some spread into adjacent fields. Winter rainfall and greener vegetation were reported for 2024, so precipitation and short-term storage supported the rise while irrigation continued to underpin the core area.[15]

Implications

Across 2021 to 2024, the maps show that summer consumption in Saray Qala was sustained by irrigation inside the corridor in dry years and amplified by better winter rain in 2024. Reliance on delivered water likely included private borewells, and the continuing focus of high ET in the corridor warrants close tracking of withdrawals and groundwater levels for long-term sustainability.

Map 2: Summer evapotranspiration condition, 2021-2024

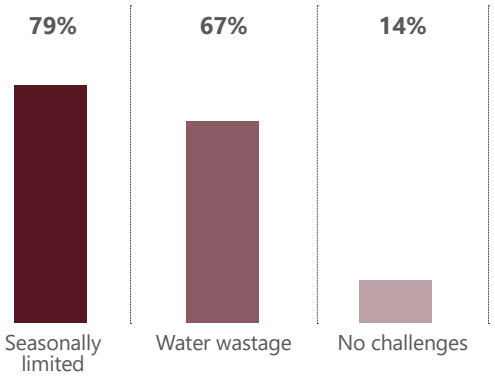


WATER AVAILABILITY AND FARMING PRACTICES

Challenges

The biggest challenge with irrigation water identified by surveyed HH was limited availability in certain seasons (79%). A majority also referred to water wastage (67%), which may point to households perceiving water as being used relatively inefficiently, for example through flood irrigation. A small proportion indicated that there were currently no challenges with irrigation water, despite high reported levels of concern about future availability of irrigation water.

Biggest challenges with irrigation water (% of surveyed HH)[6]



KIs pointed to inadequate irrigation infrastructure, water shortages due to declines in available spring water and climate change, as well as damages to infrastructure as the biggest challenges in the manteqa.

SUMMARY

- Seasonal shortages seem to be common, with irrigation water reportedly drying mid-season and short time limits on use reported by many households.
- Farming appears mainly for household use, with some surplus sold; crop choices are reportedly driven by consumption needs and seed affordability.
- Most households reported having changed farming practices and taken up additional work due to water scarcity and low agricultural income.
- Evapotranspiration increased in some years despite drought, indicating intensified irrigation and pressure on groundwater.
- Water wastage and limited knowledge were cited as key issues, pointing to both scarcity and inefficiency in irrigation practices.

Conclusion

Households in Saray Qala seem to face persistent challenges related to irrigation water availability, with the majority reporting seasonal shortages and mid-season drying of sources. These constraints are compounded by apparently limited predictability at the start of the planting season, with most households reportedly relying on personal experience or weather forecasts rather than institutional sources. Despite the prevalence of public water sources and the role of local water managers, infrastructure deterioration, sediment buildup, and limited storage capacity appear to undermine the reliability of irrigation systems.
Key informants further highlighted the impact of declining spring water and climate variability on water availability, while households pointed to water wastage and inefficient practices as additional stressors. Financial constraints were the most commonly reported barrier to improving irrigation infrastructure, followed by limited technical knowledge and access to appropriate technologies. These systemic limitations may restrict the ability of communities to adapt to changing environmental conditions.
Most households have reportedly had to adjust their farming practices in response to water scarcity, and many seem to have taken up additional off-farm work to compensate for declining agricultural income. Farming appears to remain primarily subsistence-oriented, with crop choices driven by local consumption needs and seed affordability. However, evapotranspiration data from recent years shows increased water consumption in irrigated areas, even during dry periods, suggesting intensified irrigation efforts that may place further pressure on available water resources, including on groundwater.
Together, these findings may point to a convergence of environmental stress, infrastructural fragility, and socio-economic vulnerability that threatens the sustainability of irrigation-based livelihoods in Saray Qala.

METHODOLOGY OVERVIEW

The Irrigation Management Assessment utilized manteqas as the primary unit of analysis. Manteqas are locally recognized geographic areas smaller than districts but larger than individual settlements, defined by shared natural resources, socio-economic ties, and customary governance structures. In the five assessed manteqas, data was collected through a combination of household (HH) surveys and key informant interviews (KIIs), including local water managers and irrigation governance stakeholders.

The sampling approach for the HH survey employed a two-stage stratified cluster methodology. Settlements were first randomly selected within each manteqa, followed by random selection of households within those settlements. A minimum of six households were surveyed per settlement, with quotas split evenly between households engaged in irrigated agriculture and those relying on pasture-based livestock. To ensure inclusivity, female enumerators conducted interviews with women where access was permitted, including remote interviews in restricted areas. In Dasht-e Laili, a total of 81 HH interviews were conducted, 17 of which with female-headed households. Key Informant interviews were conducted with 2 local water managers and 1 district-level official from the relevant line department involved in natural resource management.

In parallel, remote sensing analysis was conducted using evapotranspiration estimates to assess spatial and temporal variation in irrigation performance. This geospatial component enabled triangulation of field data with satellite imagery to identify patterns in water use and stress over time.

Limitations:

- With exact figures for the target population unknown, findings presented here should be considered indicative.
- Access constraints limited in-person interviews with women in some areas, potentially affecting gender-disaggregated insights.
- Remote Sensing data relies on coarse resolution (500m x 500m), providing limited insights into sub-manteqa-level trends.

For more information, please refer to the TOR.

Endnotes

1 Drought Impact and Resilience in Agro-Pastoral Communities in Northwest Afghanistan: Saray Qala Manteqa Profile. REACH Afghanistan, May 2025. Link .

2 A manteqa is a locally recognized geographic area made up of several villages, defined by natural features and shared identity, history, and resource management practices; it functions as a basic reference point for inhabitants and is reinforced by customary governance structures that support community resilience.

3 Manteqa Profiles. REACH Afghanistan, 2024. Available on request

4 Pasture and Irrigation Management. REACH Afghanistan, 2024. Demographic indicators were captured across both assessments and are considered statistically representative at 95/5.

5 Manteqa Profiles. REACH Afghanistan, 2024. Available on request.

6 Respondents could select multiple options.

7 Integrated Groundwater Study in Astana Valley, Shirin Tagab District of Faryab Province, Afghanistan. DACAAR, June 2010 Link.

8 19% of surveyed households reported being "somewhat" concerned about future irrigation water availability, and only 2% reported no concern.

9 Manteqa Profiles. REACH Afghanistan. 2024. Available on request.

10 Manteqa Profiles. REACH Afghanistan, 2024. Available on request.

11 Irrigation water limits in Northwest Afghanistan are traditionally imposed through opening or closing canal sections after a specific amount of time set by the respective water management stakeholders (e.g. Mirab).

12 A jerib is a unit of land measurement equivalent to roughly half an acre.

13 Drought Impact and Resilience, Saray Qala.

14 Drought Impact and Resilience, Saray Qala.

15 Drought Impact and Resilience, Saray Qala

About AGORA

AGORA is a joint venture between Acted and IMPACT Initiatives created in 2016 to operationalise our motto « Think local, Act global ». It is **an innovative area-based approach** that aims to **better address the relief, environmental and development needs of people in fragile contexts through a NEXUS approach**.

The key value added of AGORA is:

- Working at the **right geographical scale**, enabling both meaningful engagement with local actors and the ability to scale-up the action
- Contextualizing action through a strong evidence-base and reliance on **local knowledge** to inform programme approaches
- **Putting local actors at the centre** by strengthening their capacity, enabling them to identify their own needs and response priorities through participative research and planning approaches, and to participate and monitor implementation
- **Linking local and external actors** so that the latter can contribute resources and capacity to implement local solutions and response priorities.

AGORA strengthens territorial resilience by enabling a wide range of programmes, including strengthening local governance, improving basic services and livelihoods, climate change adaptation and mitigation, improving natural resources management, disaster risk reduction and management, anticipatory action, or supporting durable solutions to displacement.

AGORA has already been piloted in **17 countries through 20 projects**, reaching approximately **1,8 million direct beneficiaries** and supporting **nearly 1,294 organisations**.