PROFILE

Irrigation Management in Alsha Wuloswali, Samangan

August 2025 | Alsha Manteqa, Samangan Province, Afghanistan

KEY MESSAGES

- Irrigation appears to have shifted predominantly to private solar-powered borewells. Canals and traditional managers continue to organize collective works but play a smaller role in everyday irrigation which suggests more fragmented collective governance.
- Decisions and knowledge about irrigation water use appear to be spread through communities rather than through formal extension services. This may sustain familiar practices but can also be highly effective in spreading improved methods if given support.
- Prolonged drought and rising summer evapotranspiration indicate growing pressure on groundwater. Without some degree of coordination and investment in repairs or water storage existing systems may come under increasing strain.

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.

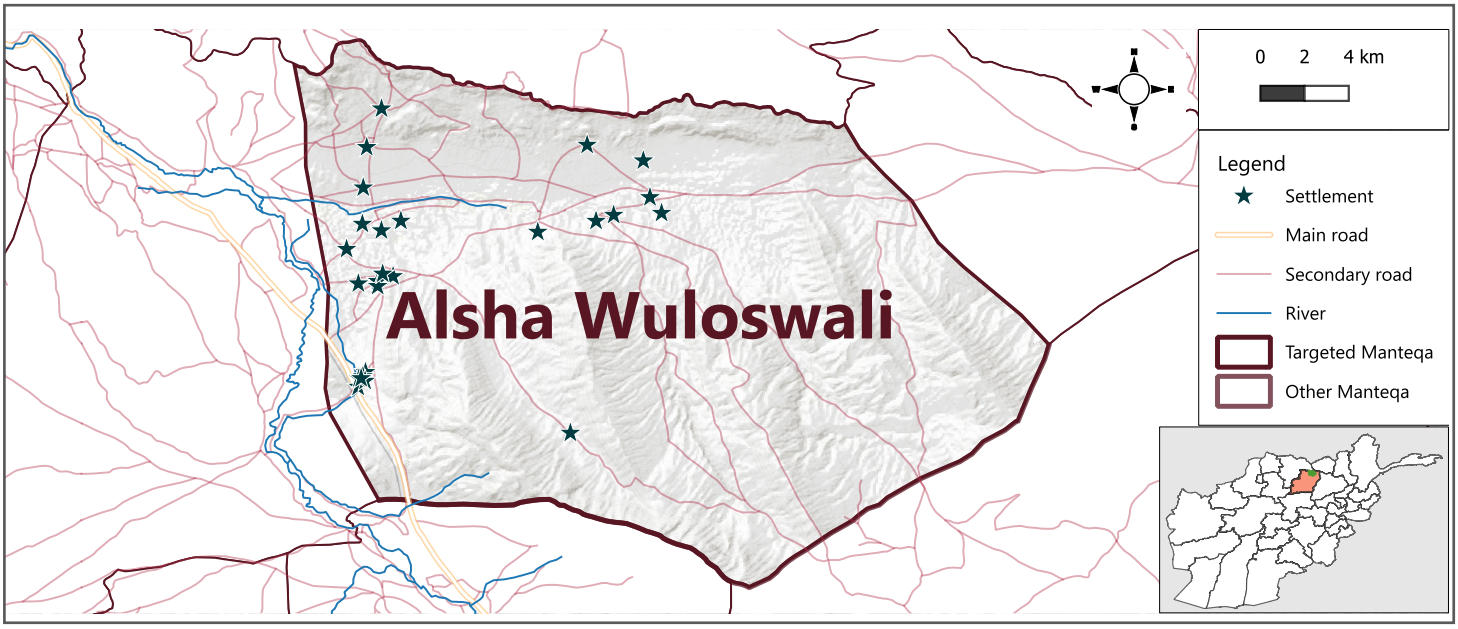
Methodology

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: Alsha Manteqa



IRRIGATION INFRASTRUCTURE AND COORDINATION

Introduction

Alsha is located in Samangan Province, comprising 18 villages with an estimated 6,197 households (35,330 individuals).[3] Less than 1% of the population are returnees and around 5% are internally displaced persons (IDPs).[4] According to a previous assessment, most of Alsha's residents rely on agriculture for their livelihoods, and around 1% of its area is considered irrigated land, all of which is located around the manteqa's settlements.[5]

Water sources and infrastructure

100%

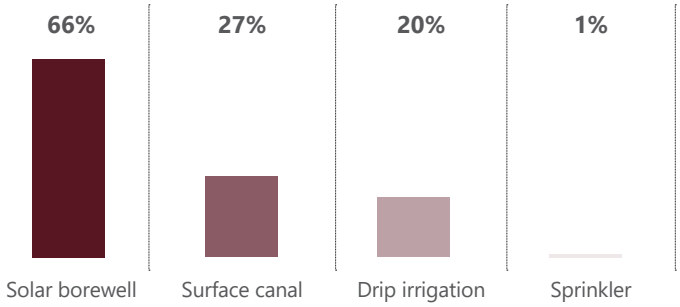
All surveyed households identified borewells as their main irrigation source.

As per a previous REACH assessment, this likely is likely to enhance risks of overextraction, with groundwater levels and soil moisture dropping substantially in dry periods.[6] However, households often combine borewells with other systems such as canals or drip irrigation.

According to KIs, other common irrigation infrastructures in the manteqa include surface canals, underground canals (*karez*), and natural streams, fed mostly by rainwater and snow-melt.

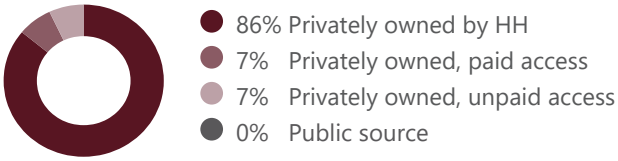
While all households reported using borewells as their main irrigation source, many also described additional irrigation methods. The chart below shows the share of households using each irrigation system (multiple responses allowed). This indicates that irrigation practices involve a mix of water delivery systems, not just groundwater extraction.

Irrigation systems used (% of surveyed HH)



Private ownership of water sources in the manteqa seems widespread, with no HH reporting public ownership. Households that do not rely on common infrastructure may be less likely to coordinate with others, which may risk local overextraction of available water.

Reported ownership of water source (% of surveyed HH)

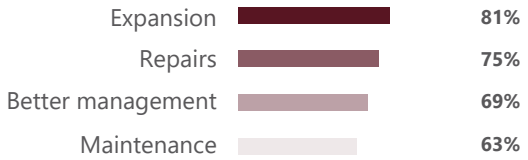


Maintenance of irrigation infrastructure

KIs indicated that existing water infrastructure is maintained through community action and community financial contribution. 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 expansion (81%), repairs (75%), better management (69%) and maintenance (63%). Since all surveyed households also seemed to rely on borewells, the findings may point to underlying factors driving their widespread use.

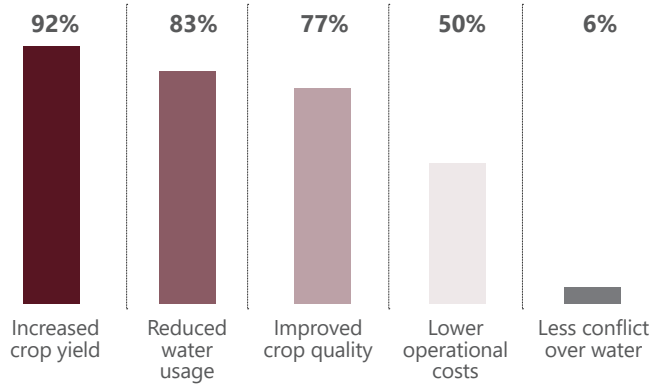
Desired irrigation infrastructure improvements (% of surveyed HH)



KIs echoed the need for repairs and expansion of existing infrastructure, and suggested training for farmers to improve knowledge and reduce water wastage.

Survey results further hint at reasons for these perceived needs, with most respondents pointing to increased yields (92%), reduced water usage (83%), improved crop quality (77%) and lower operational costs (59%) as expected outcomes. These findings indicate that farmers may be ready to rely on expanded common irrigation infrastructure more, provided it fills the gap that borewells seem to cover currently.

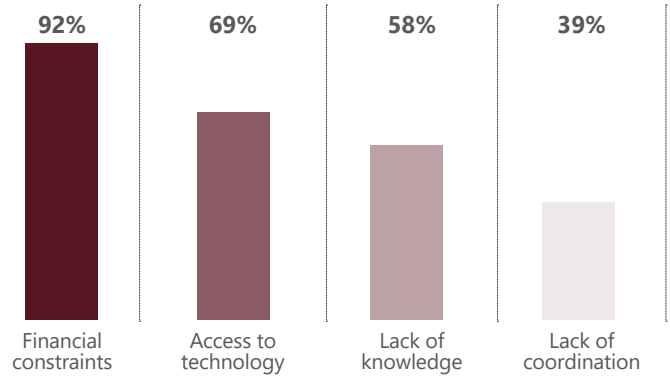
Expected outcomes of the desired irrigation infrastructure improvements in the manteqa (% of surveyed HH)



IRRIGATION INFRASTRUCTURE AND COORDINATION

Barriers to implementing such improvements were overwhelmingly reported as financial (92%). Other reported constraints included a lack of access to more efficient technology for irrigation systems (69%) and insufficient knowledge (58%) to implement changes. 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

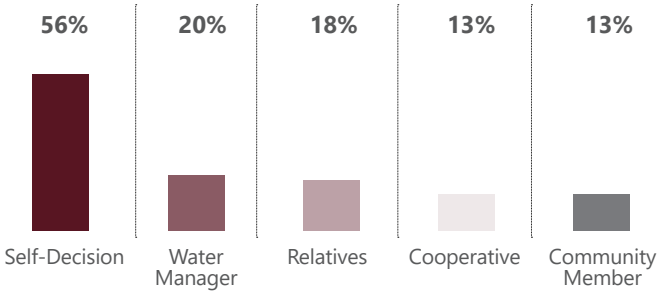


Water allocation and decision-making

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.

In contrast, the majority of surveyed HH (56%) reported making independent decisions on irrigation water use, likely due to their reliance on groundwater. Despite the prevalence of private ownership, 20% indicated consulting water managers, while 13% referred to other community members outside the households as potentially influencing their decisions.

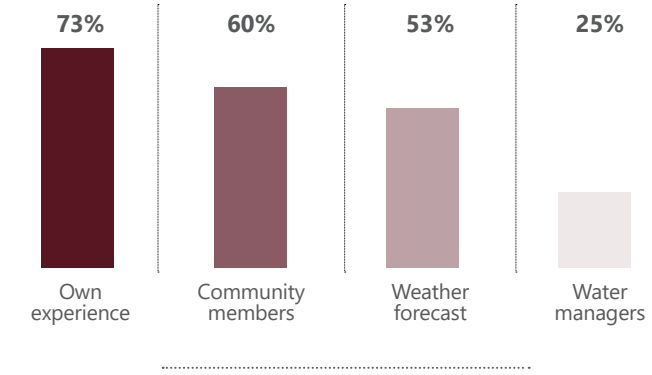
% of surveyed HH that reported consulting other actors for irrigation water use



Key Informants highlighted the role of local water managers (*Mirab Bashi* and *Chakbashi*) that engage with communities on irrigation water through local councils (*jirga*) and meetings.

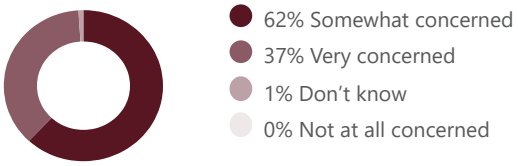
In addition drawing on their own experience (77%), surveyed HH reported learning about the availability of irrigation water at the start of the season from other community members (60%), weather forecasts (53%) and water managers (25%). While the prevalence of private boreholes may mean less coordination, water managers drawing on customary practices do seem to be an important source of information for some households.

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



Almost all surveyed HH reported at least some concern about the availability of irrigation water in the future. Borewells may isolate farmers from the immediate effects of low seasonal precipitation and allow them to autonomously decide on water use, but it is likely many are aware of the risk to sustainability of groundwater extraction for irrigation in the manteqa, especially in dry years.

% of surveyed HH by reported level of concern about future irrigation water availability



SUMMARY

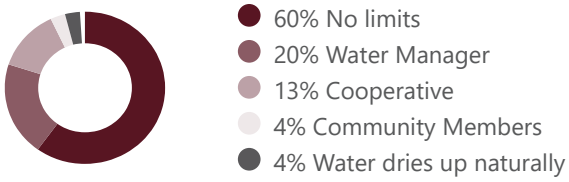
- Groundwater accessed through borewells is the main source of irrigation water for households, though other infrastructures like canals and streams remain part of the system.
- Widespread private ownership of water sources may reduce reliance on shared infrastructure and weaken incentives for collective coordination.
- Both households and key informants see a strong need for expansion, repair, and better management of irrigation systems, with the goal of higher yields and more efficient water use.
- Financial barriers, lack of technology, and limited knowledge hinder improvements, suggesting that agricultural extension services could play an important role.
- Water allocation is shaped by customary practices and local water managers, but private borewells allow households to make decisions independently, raising concerns about long-term groundwater sustainability.

WATER AVAILABILITY AND FARMING PRACTICES

Availability of Irrigation Water

Although Key Informants pointed to water managers being in charge of water allocation, around 60% of surveyed HH did not report any imposed limits on irrigation water, likely because of high rates of private ownership of water sources.[8] Nonetheless, some HH reported limits imposed by water managers (20%), cooperatives (13%) and other community members (4%).

% of surveyed HH by imposed limits on irrigation water

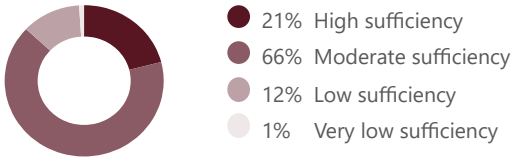


Among those facing restrictions, 65% reported a daily time limit exceeding five hours. These limits are at the higher end of what is typical in the region and, although exact extraction rates are unknown, they may indicate a substantial risk of overextraction if local groundwater availability is not taken into account.

On average, surveyed HH irrigate **6 jerib** on **49 Days** per year[9]

While many households appear able to cultivate under current conditions, shortages and limited predictability may still constrain stability. Surveyed households reported differing levels of irrigation water sufficiency, with most falling in a moderate range and smaller shares reporting either high or low sufficiency.

Aggregated irrigation water sufficiency (% of surveyed HH)

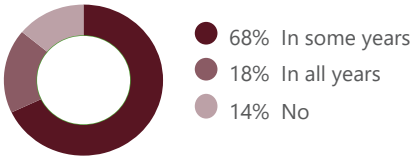


This measure combines household experiences of sufficiency, seasonal variation, duration of shortages, and predictability at planting to reflect the overall stability of irrigation supply.

Nearly all 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

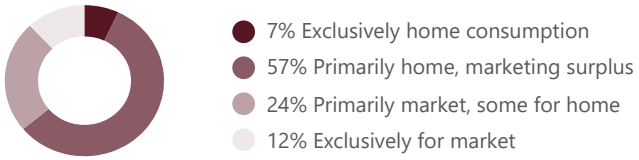


Cropping Patterns and Agricultural Activity

According to findings from an earlier REACH profiling, vegetables, cereals (wheat, barley, maize), and root crops are widely grown in the manteqa.[7]

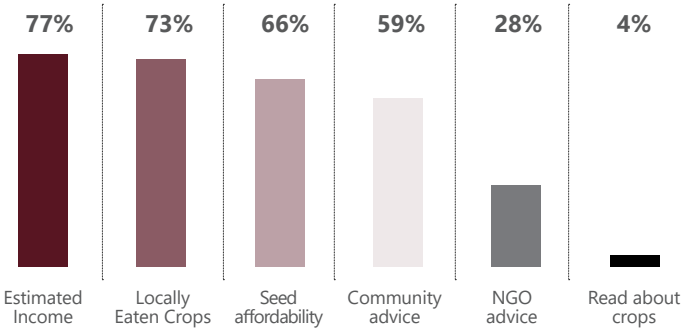
Farming is not only for household use. More than half of households reportedly farm primarily for home use with market surplus, about one quarter farm primarily for market with some home consumption.

Reasons for farming (% of surveyed HH)



The main reported reasons for selecting a crop type were expected income (76 percent), local consumption needs (74 percent), and seed affordability (67 percent).

Reasons for crop selection (% of surveyed HH)



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

Remote sensing data show ET values of 3.26 mm in 2021 and 2.91 mm in 2022. These years coincided with widespread drought.[10] In such conditions, ET in rainfed areas was likely capped by soil moisture, and where irrigation inputs were limited, ET fell despite high atmospheric demand. The 2022 dip is consistent with a combination of high evaporative demand and constrained water supply.

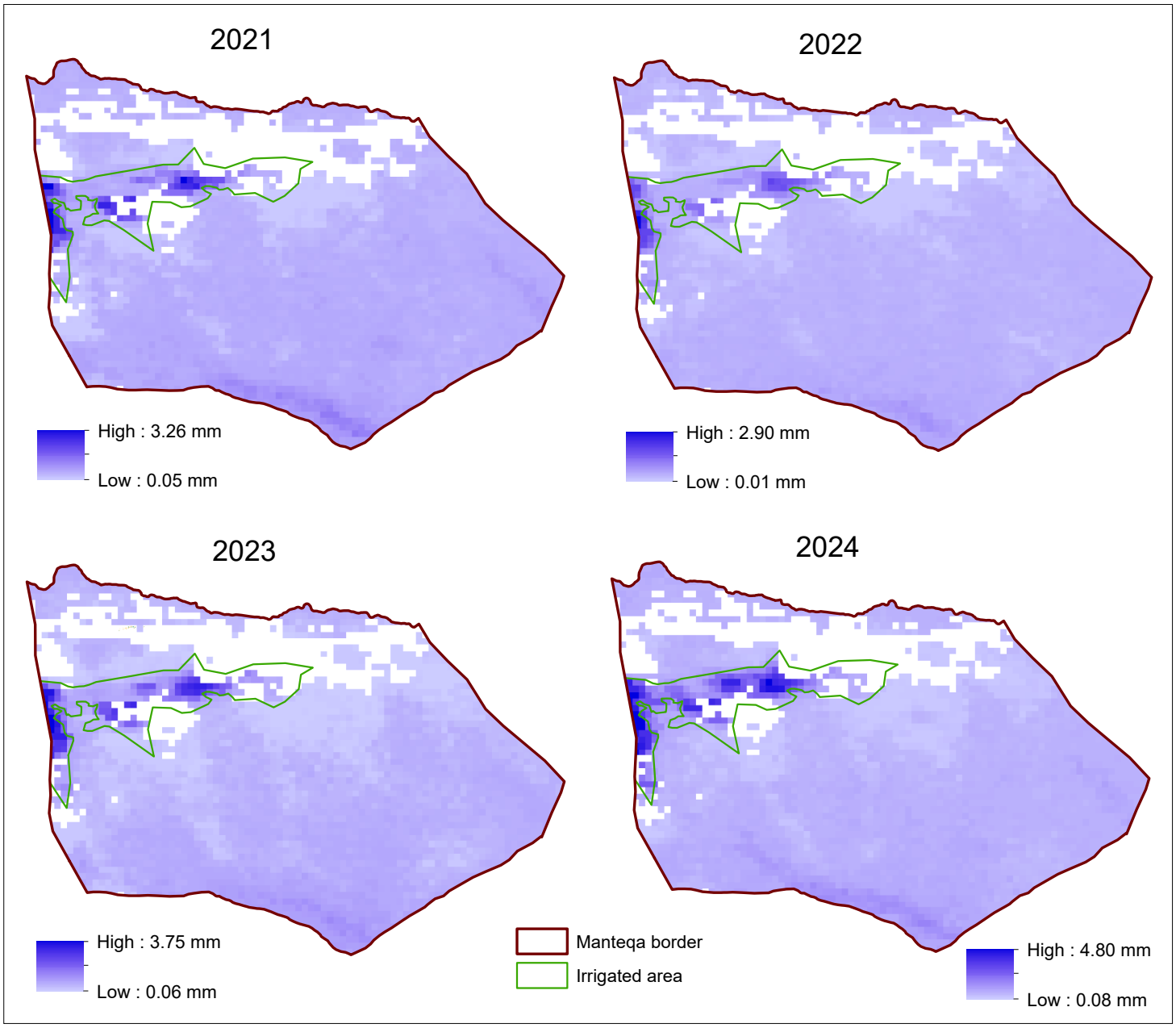
2023–2024

In 2023, ET rose to 3.75 mm and in 2024 peaked at 4.8 mm, despite above average summer temperatures.[11] This indicates that farmers compensated by applying more irrigation. However, satellite data also recorded a decline in soil moisture in 2024, showing that irrigation sustained crop transpiration but did not replenish the soil profile.[12]

Implications

The shifts between 2021-2024 point to growing dependence on groundwater extraction, most likely through private borewells. The concurrent soil moisture decline in 2024 suggests that this compensation is increasingly unsustainable. Unless rainfall improves, the coming years will likely bring heavier irrigation pressure, deeper reliance on borewells, and mounting stress on already depleted aquifers.

Map 2: Summer evapotranspiration condition, 2021-2024

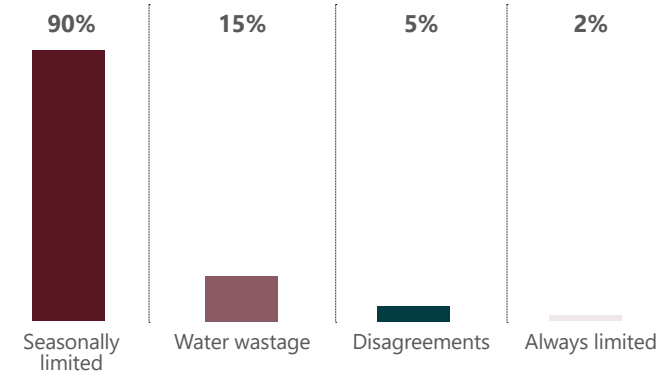


WATER AVAILABILITY AND FARMING PRACTICES

Challenges

The biggest challenge with irrigation water identified by HH was limited availability in certain seasons (90%), while only 15% reported water wastage, which may point to households perceiving water as being used relatively efficiently. Only a small proportion referred to disagreements, likely owed to high rates of private ownership and borehole use.

Biggest challenges with irrigation water (% of surveyed HH)



KIs pointed to water wastage and a lack of knowledge on the use of irrigation water as the biggest challenges in the manteqa.

SUMMARY

- Irrigation is largely shaped by private control of water sources, with few limits imposed, which reduces conflict but raises risks of unchecked extraction.
- Most households secure enough water to farm but face recurring shortages that force them to adjust crops or seek other income, undermining livelihood stability
- Farming centers on cereals, vegetables, and root crops, with production aimed at both household use and local markets, and crop choices guided by income and subsistence needs.
- Evapotranspiration data show suppressed water use during early drought years, followed by a sharp rise in later years despite ongoing dryness, reflecting intensified irrigation.
- The combination of rising evapotranspiration and declining soil moisture signals growing reliance on private borewells and increasing pressure on groundwater reserves, raising concerns about long-term sustainability.
- Households saw seasonal scarcity as the main irrigation challenge, while key informants emphasized water wastage and limited knowledge of efficient use. Together, these views point to both insufficient availability and inefficient management as drivers of stress on water resources.

Conclusion

Alsha's irrigation appears to be increasingly centered on privately managed solar borewells, while canals and traditional managers continue to organize collective works but seem to play a subordinate role in everyday water use. Households plan around seasonal variability and uncertain starts to the season, draw mainly on community networks for knowledge, and adjust crops and income sources when needed. Prolonged drought has likely intensified reliance on groundwater and may be raising summer pressures, with indicative evidence from household reports and remote sensing pointing to rising water demand. This pattern seems to sustain many households for now, but continued drought may strain both borewell reliability and the shared systems that still provide value at the margins.

The predominance of borewells suggests that groundwater now sits at the core of local irrigation. While wells may provide households with greater autonomy and reliability than traditional schemes, the absence of manteqa-level coordination or simple monitoring indicates potential risks for long-term sustainability. If shared infrastructure is not maintained, water storage not developed, or knowledge of efficient irrigation not strengthened, groundwater depletion may accelerate, planting decisions may become less predictable, and the stability of agricultural livelihoods could be increasingly at risk under prolonged drought.

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 Alsha, a total of 84 HH interviews were conducted, 22 of which with female-headed households. Key Informant interviews were conducted with 2 local water managers and 2 district-level officials 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: Alsha Wuloswali 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 Drought Impact and Resilience in Agro-Pastoral Communities in Northwest Afghanistan: Alsha Wuloswali Manteqa Profile (June 2024 – April 2025). AGORA/IMPACT, June 2024. Link

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

8 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).

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

10 Climate, Peace and Security Fact Sheet: Afghanistan. SIPRI, February 2022. Link

11 Seasonal Monitor: June 2024. FEWS NET, June 2024. Link

12 Drought Impact Alsha Wuloswali Manteqa Profile.

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**.