

# Irrigation Management in Dasht-e Laili Manteqa, Faryab

August 2025 | Dasht-e Laili Manteqa, Faryab Province, Afghanistan

## KEY MESSAGES

- While borewells appear to be a common water source, many of the manteqa's water sources seem to be public, with water managers making in charge of coordination and water allocation.
- Irrigation water seems to be insufficient for the manteqa's irrigation water demands, with most households experiencing insufficiency, taking up additional work to bridge income gaps, and nearly all respondents expressing worry about availability of irrigation water in the future.
- Prolonged drought and rising summer evapotranspiration indicate growing pressure on groundwater. Without some degree of investment in repairs, water storage, or more efficient water delivery, existing resources are likely to continue experience unsustainable levels of strain.

## 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.<sup>1</sup> 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.

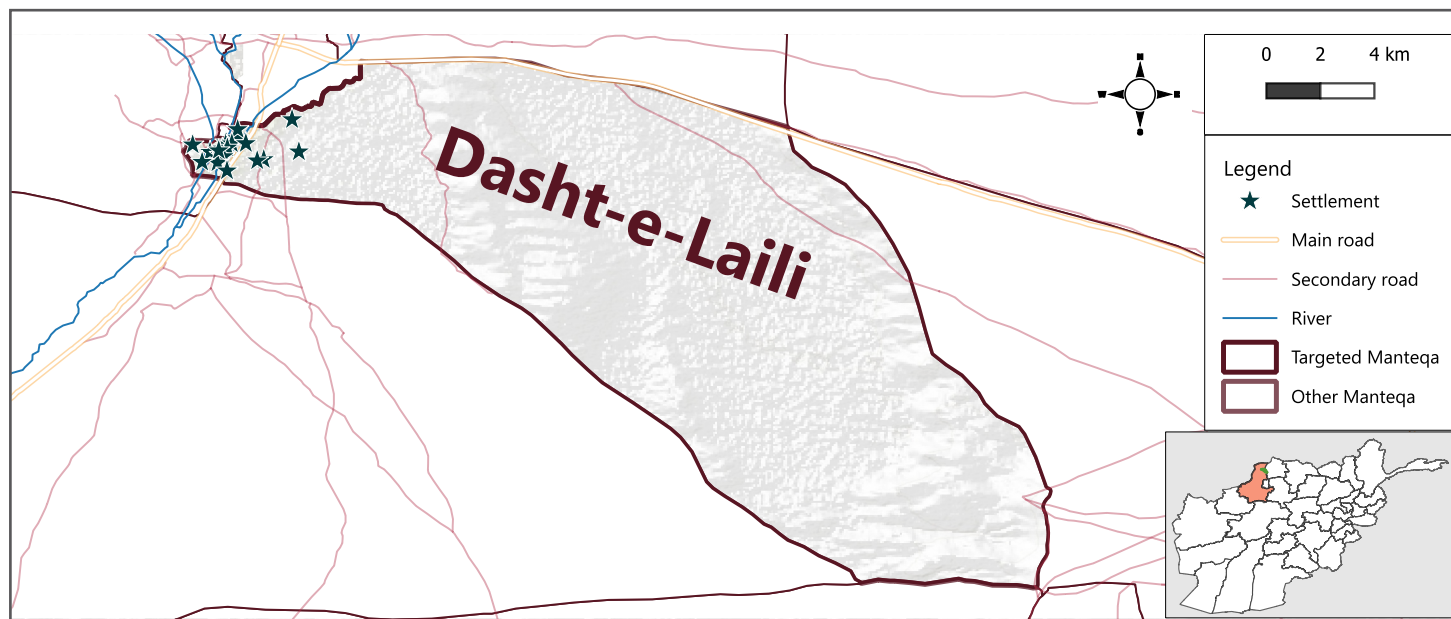
## ASSESSMENT OVERVIEW

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.<sup>2</sup> 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](#).

Map 1: Dasht-e Laili Manteqa



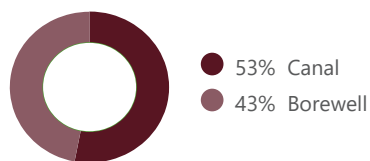
# IRRIGATION INFRASTRUCTURE AND COORDINATION

## Introduction

Dasht-e Laili is located in Faryab Province, comprising 19 villages with an estimated 3,810 households (24,632 individuals).<sup>3</sup> Less than 1% of the population are returnees and around 5% are internally displaced persons (IDPs).<sup>4</sup> 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.<sup>5</sup>

## Water sources and infrastructure

### Primary irrigation water source (by % of surveyed HH)

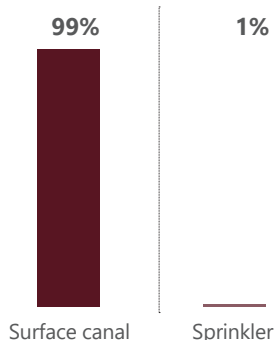


Just under half of surveyed HHs reported drawing irrigation water from canals, while the rest rely on borewells. As per a previous REACH assessment, excessive use of borewells is likely to enhance risks of overextraction, with groundwater levels and soil moisture dropping substantially in dry periods.<sup>7</sup>

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.

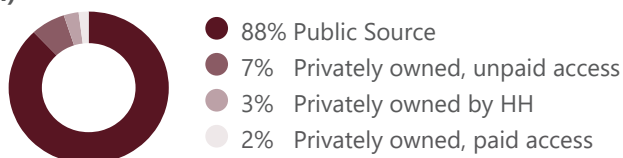
While many surveyed households reported using borewells as their main irrigation source, many also described surface canals as additional irrigation methods. The chart below shows the share of households using each irrigation system (multiple responses allowed). This indicates that irrigation practices involve a mix of water delivery systems, even if based on groundwater extraction.

### Irrigation systems used (% of surveyed HH)<sup>6</sup>



The use of public water sources in the manteqa seems widespread, with relatively few reporting private ownership. Given that nearly half of HH reported borewells as their primary water source, it seems likely that some borewells are considered public.

### Reported ownership of water source (% of surveyed HH)

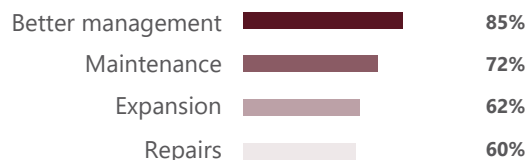


## Maintenance of irrigation infrastructure

KIs indicated that existing water infrastructure is maintained through community action and community financial contributions, with the help of the local government department for irrigation, and NGOs. 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 better management (85%), maintenance (72%), expansion (62%) and repairs (60%). Since most surveyed households also seemed to rely on public sources, the findings may point to underlying stress factors for those relying on shared water resources for their livelihoods.

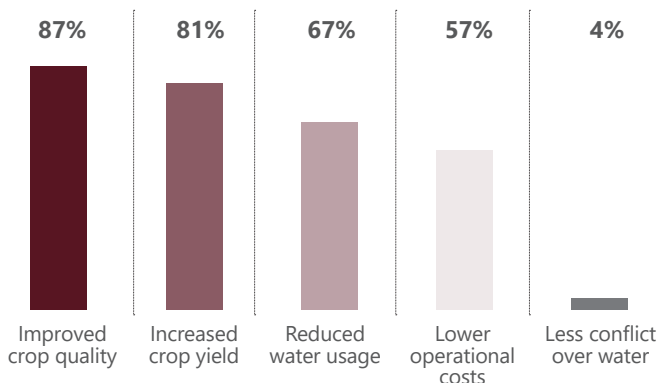
### Desired irrigation infrastructure improvements (% of surveyed HH)<sup>6</sup>



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

Survey results further hint at reasons for these perceived needs, with most respondents pointing to improved crop quality (87%), increased yields (81%), reduced water usage (67%), and lower operational costs (57%) as expected outcomes. It seems 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.

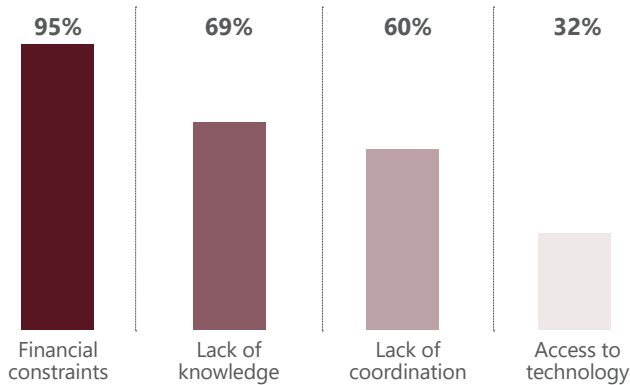
### Expected outcomes of the desired irrigation infrastructure improvements in the manteqa (% of surveyed HH)<sup>6</sup>



# IRRIGATION INFRASTRUCTURE AND COORDINATION

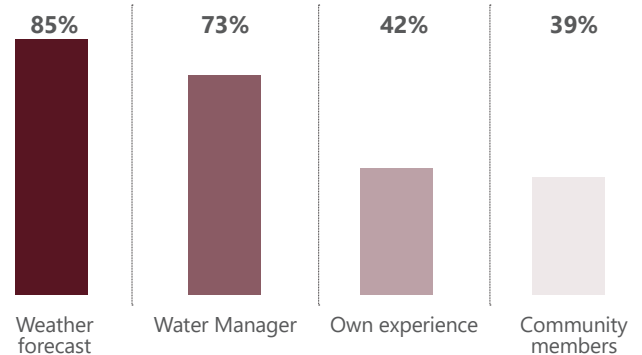
Barriers to implementing such improvements were overwhelmingly reported as financial (95%). Other reported constraints included a lack of knowledge (69%) and a lack of coordination (60%), while fewer mentioned access to more efficient technology for irrigation systems (32%). Based on these findings, 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<sup>6</sup>**



Most surveyed HH reported learning about the availability of irrigation water at the start of the season from weather forecasts (85%) and water managers (73%), with less than half relying on their own experience or the advice of other community members. These findings may suggest that own experiences are trusted less than more institutional sources, perhaps due to an increase in droughts communities seem to have witnessed in past years.<sup>8</sup>

**% of surveyed HH by reported information sources for availability of irrigation water at the start of the planting season<sup>6</sup>**

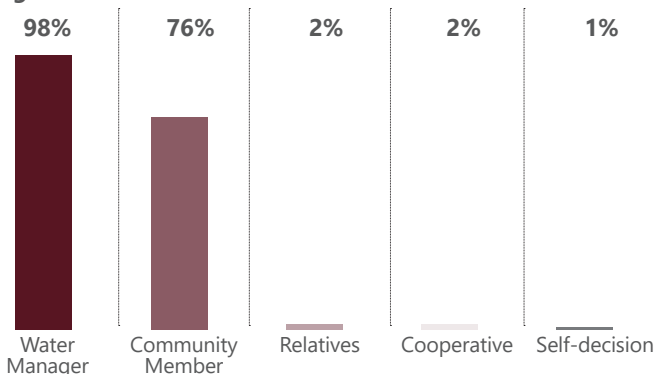


## Water allocation and decision-making

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 the climate having seriously affected the availability of water.

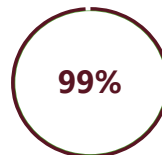
Nearly all (98%) surveyed HH reported consulting water managers before using irrigation water, hinting at strong local governance mechanisms for irrigation water. Despite some HH reportedly using private sources, almost no surveyed HHs seemed to make independent decisions, although many suggested coordination with other community members (76%) in addition to water managers.

**% of surveyed HH that reported consulting other actors for irrigation water use<sup>6</sup>**



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, as well as with the respective line departments.

All surveyed HHs reported being concerned about future irrigation water availability.<sup>9</sup> It is likely that already limited resources and declining groundwater levels as well as consecutive droughts have contributed to high levels of concern. While daily labor is reportedly the most common source of income in the manteqa, agriculture seems to remain an important means of subsistence that may be eroded if irrigation water availability declines.<sup>10</sup>



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

## SUMMARY

- Irrigation canals and borewells seem to be the main water sources in the manteqa, though other infrastructures like underground canals and streams remain part of the system.
- High reported levels of reliance on public water sources may serve as an incentive for collective coordination.
- Both households and key informants saw a strong need for expansion, repair, and better management of irrigation systems, with the goal of improved crop quality, higher yields and more efficient water use.
- Reportedly, financial barriers, lack of technology, and limited knowledge hinder improvements, suggesting that agricultural extension services could play an important role.
- Water allocation seems to be shaped by customary practices and local water managers, but despite high reported levels of coordinating with such actors nearly all surveyed HHs are very concerned about the availability of irrigation water in the future.

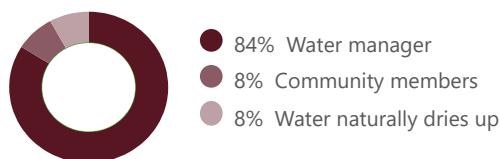


# WATER AVAILABILITY AND FARMING PRACTICES

## Availability of Irrigation Water

Despite many households seeming to use borewells, the large majority of households reported limits on irrigation water imposed by water managers (80%).<sup>12</sup> For some, limits are also set by other community members (8%), broadly in line with reported levels of private ownership of water sources. For the remainder, water seems to dry up naturally (8%), which may be a regular occurrence due to the manteqa's climate or reflect the impact of drought conditions on water availability.

### % of surveyed HH by imposed limits on irrigation water

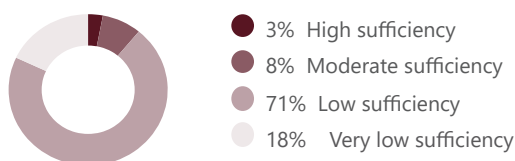


Among those facing restrictions, 69% reported a daily time limit of less than 30 minutes. These limits fall at the lower end of what is common in the region and, given the relatively small land areas cultivated, suggest that irrigation agriculture may be heavily constrained by water availability.

On average, surveyed HH irrigate **8 jerib** on **4 Days** per year<sup>13</sup>

For most surveyed households, shortages and limited predictability seem to seriously constrain the stability of agricultural livelihoods. Based on reported levels of irrigation water sufficiency, only 3% experienced high sufficiency, and only 8% moderate sufficiency, with all others falling into the low and very low categories.

### Aggregated irrigation water sufficiency (% of surveyed HH)



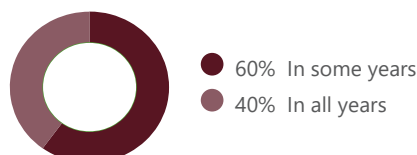
*This measure combines household experiences of sufficiency, seasonal variation, duration of shortages, and predictability at planting to reflect the overall stability of irrigation supply.*

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

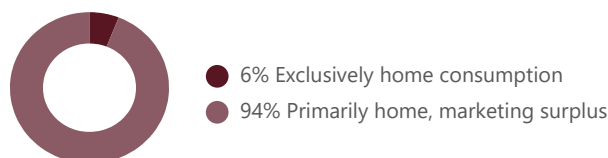


## Cropping Patterns and Agricultural Activity

According to findings from an earlier REACH profiling, vegetables, cereals (wheat, barley, maize), and root crops are widely grown in the manteqa.<sup>11</sup>

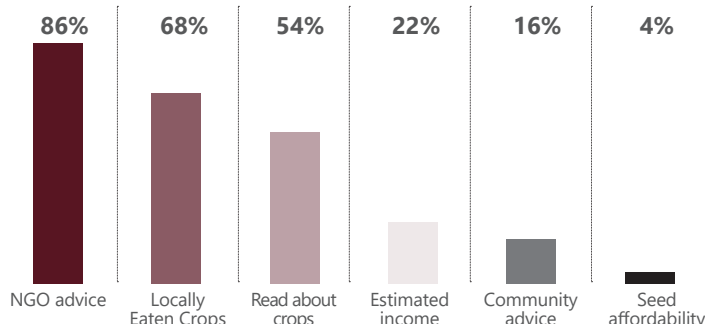
Farming seems to be mostly for household use. Nearly all surveyed HH reportedly farmed primarily for home use with market surplus, while a small proportion exclusively farmed for home consumption.

### Reasons for farming (% of surveyed HH)



Crop selection seems to be heavily driven by NGO advice, more so than any other reason reported by HH. A majority also indicated selecting crops common in the area, while over half suggested they read about selected crops. These findings likely reflect the impact of ongoing NGO activities in the manteqa.

### Reasons for crop selection (% of surveyed HH)<sup>6</sup>



# 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.

### 2021–2023

ET values remained low at about 0.58 mm across 2021, 2022, and 2023. This stability shows that evapotranspiration was constrained, with little change despite warmer conditions over recent decades. Precipitation during 2020–2022 was already below normal at about 184 mm, and in 2023 it fell further to 118 mm, the lowest in forty years. Soil moisture in 2023 also dropped earlier and more severely than in previous years, while groundwater records show a steady decline after 2020.<sup>14</sup> Together these observations confirm that limited water availability kept ET at low levels through this three-year period, which suggests that irrigation agriculture was not able to compensate for the shortage.

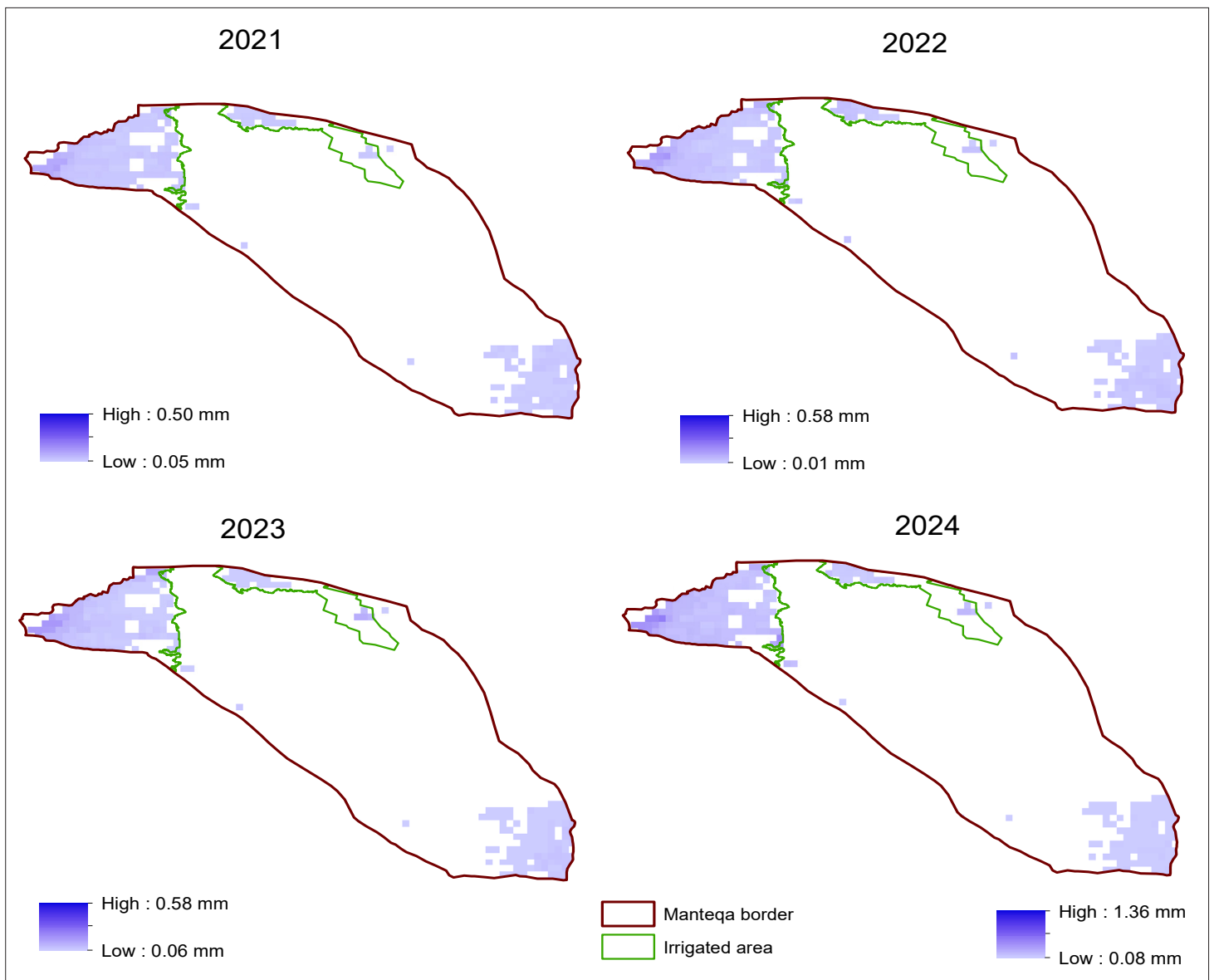
### 2024

ET increased to about 1.36 mm, more than double the levels of the previous three years. This rise occurred despite reports of below-average precipitation in northwest Afghanistan and continued declines in soil moisture and groundwater storage. The most likely explanation is a short-term increase in irrigation that allowed crops to transpire more actively. This suggests that farmers were able to boost water use in 2024, but without replenishing reserves, raising concerns about the sustainability of irrigation agriculture under declining natural supplies.

### Implications

The shifts between 2021 and 2024 point to growing dependence on groundwater extraction, probably through private borewells. The continued drop in soil moisture in 2024 suggests that higher irrigation supported crops only in the short term, raising concerns for long-term sustainability.

Map 2: Summer evapotranspiration condition, 2021-2024

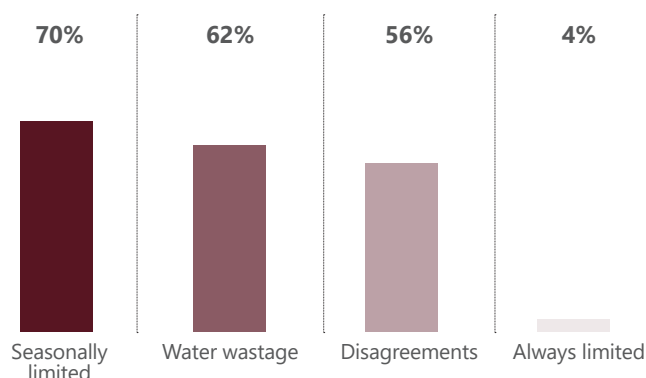


# WATER AVAILABILITY AND FARMING PRACTICES

## Challenges

The biggest challenge with irrigation water identified by HH was limited availability in certain seasons (70%), but many also referred to water wastage (62%), which may point to households perceiving water as being used relatively inefficiently. Perhaps as a result of this, and despite the reported involvement of water managers in irrigation water decisions, more than half also referred to disagreements as one of the main challenges.

### Biggest challenges with irrigation water (% of surveyed HH)



KIs pointed to water being insufficient for agricultural purposes, declines in available spring water, and frequent breakdowns of the existing irrigation infrastructure due to substandard materials as the biggest challenges in the manteqa.

## Conclusion

Dasht-e Laili's irrigation appears to be centered on public water sources, with traditional water managers overseeing coordination and water allocation. Households experiences seem to be shaped by seasonal variability and recurrent shortages, with many drawing on water managers, weather forecasts and NGOs knowledge, and adjust crops and income sources to sustain income levels. Prolonged drought has likely intensified reliance on groundwater and may be raising seasonal pressures, with indicative evidence from household reports and remote sensing pointing to rising water demand. Despite this, already continued drought may have already strained available water resources beyond levels that could sustain agriculture. Most respondents seemed to be aware of this, with nearly all households being concerned about the availability of irrigation water in the future.

Key informants also pointed to gaps in the quality of the manteqa's irrigation infrastructure that lead to inefficient use and frequent repair or maintenance needs. Without efforts that address these issues, agricultural livelihoods in Dasht-e Laili that rely on irrigation water will likely continue to be at risk.

## SUMMARY

- Irrigation seems to be largely shaped by strict limits on water use imposed by water managers, which may reduce conflict but severely limit agricultural productivity.
- Most households do not seem to secure enough water to farm and additionally 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 primarily on household use, and crop choices guided by NGO advice and subsistence needs.
- Evapotranspiration data shows suppressed water use during early drought years, followed by a rise in later years despite ongoing dryness, possibly reflecting intensified irrigation.
- The combination of rising evapotranspiration and declining soil moisture may signal 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 point to both insufficient availability and inefficient irrigation mechanisms as drivers of stress on water resources.

## METHODOLOGY OVERVIEW

The Irrigation Management Assessment utilized munteqas as the primary unit of analysis. Munteqas 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 munteqas, 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 munteqa, 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 93 HH interviews were conducted, 20 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-munteqa-level trends.

For more information, please refer to the [TOR](#).

## Endnotes

1 Drought Impact and Resilience in Agro-Pastoral Communities in Northwest Afghanistan: Dasht-e Laili Munteqa Profile. REACH Afghanistan, May 2025. [Link](#)

2 A munteqa 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 Munteqa 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 Munteqa Profiles. REACH Afghanistan, 2024. Available on request.

6 Respondents could select multiple options.

7 Drought Impact and Resilience, Dasht-e Laili. REACH Afghanistan.

8 Drought Impact and Resilience, Dasht-e Laili. REACH Afghanistan.

9 The remaining 1% of surveyed households reported being "somewhat" concerned about future irrigation water availability.

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

11 Munteqa Profiles. REACH Afghanistan, 2024. Available on request.

12 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).

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

14 Drought Impact and Resilience in Dasht-e Laili.

## 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**.