

# Research Terms of Reference

Drought impact on natural resources and resilience of agro-pastoral communities – case study of 5 manteqa

AFG2401a

Afghanistan

June 2024

V1



## 1. Executive Summary

|  |  |  |                                     |  |                                     |                          |  |
|--|--|--|-------------------------------------|--|-------------------------------------|--------------------------|--|
| <b>Country of intervention</b>   | Afghanistan                            |  |                                     |  |                                     |                          |  |
| <b>Type of Emergency</b>   | <input type="checkbox"/>               | Natural hazard                         | <input type="checkbox"/>            | Conflict                                   | <input type="checkbox"/>            | Other ( <i>specify</i> ) |  |
| <b>Type of Crisis</b>  | <input type="checkbox"/>               | Sudden onset                           | <input checked="" type="checkbox"/> | Slow onset                                 | <input checked="" type="checkbox"/> | Protracted               |  |
| <b>Mandating Body/ Agency</b>  | Acted                                  |  |                                     |  |                                     |                          |  |
| <b>IMPACT Project Code</b>   | 02BAS                                  |  |                                     |  |                                     |                          |  |
| <b>Overall Research Timeframe</b> ( <i>from research design to final outputs / M&amp;E</i> ) | 01/03/2024 to 31/10/2024               |  |                                     |  |                                     |                          |  |
| <b>Research Timeframe</b><br><i>Add planned deadlines (for first cycle if more than 1)</i>   | 1. Pilot/ training: 24/06/2024         |  |                                     | 6. Preliminary presentation: __/__/____    |                                     |                          |  |
|  | 2. Start collect data: 1/07/2024       |  |                                     | 7. Outputs sent for validation: 30/09/2024 |                                     |                          |  |
|  | 3. Data collected: 15/7/2023           |  |                                     | 8. Outputs published: 15/10/2025           |                                     |                          |  |
|  | 4. Data analysed: 15/08/2024           |  |                                     | 9. Final presentation: 20/10/2025          |                                     |                          |  |
|  | 5. Data sent for validation: 15/8/2024 |  |                                     |  |                                     |                          |  |
| <b>Number of assessments</b>   | <input checked="" type="checkbox"/>    | Single assessment (one cycle)          |                                     |  |                                     |                          |  |
|  | <input type="checkbox"/>               | Multi assessment (more than one cycle) |                                     |  |                                     |                          |  |
| <b>Humanitarian milestones</b><br><i>Specify what will the assessment inform and when</i>    | <b>Milestone</b>                       |  |                                     | <b>Deadline (can be tentative)</b>         |                                     |                          |  |
|  | <input type="checkbox"/>               | Donor plan/strategy                    |                                     |  | __/__/____                          |                          |  |
|  | <input type="checkbox"/>               | Inter-cluster plan/strategy            |                                     |  | __/__/____                          |                          |  |
|  | <input type="checkbox"/>               | Cluster plan/strategy                  |                                     |  | __/__/____                          |                          |  |

|   |  |   |  |    |
|---|--|---|--|----|
| e.g. The shelter cluster will use this data to draft its Revised Flash Appeal;  | X  | NGO platform plan/strategy  | 31/10/2024   |    |
|   | X  | Other (Specify): Future quantitative assessments on (drought) vulnerability | -- / -- / --   |    |
| <b>Audience Type &amp; Dissemination</b><br>Specify <b>who</b> will the assessment inform and <b>how</b> you will disseminate to inform the audience  | <b>Audience type</b>   |   | <b>Dissemination</b>   |    |
|   | <input checked="" type="checkbox"/> Strategic<br><input checked="" type="checkbox"/> Programmatic<br><input type="checkbox"/> Operational<br><input type="checkbox"/> [Other, Specify]   |   | <input checked="" type="checkbox"/> General Product Mailing (e.g., mail to NGO consortium; HCT participants; Donors)<br><input type="checkbox"/> Cluster Mailing (Education, Shelter, and WASH) and presentation of findings at next cluster meeting<br><input type="checkbox"/> Presentation of findings (e.g., at HCT meeting; Cluster meeting)<br><input checked="" type="checkbox"/> Website Dissemination (Relief Web & REACH Resource Centre)<br><input type="checkbox"/> [Other, Specify] |    |
| <b>Stakeholder mapping</b> Has a detailed stakeholder mapping been conducted during research design to identify all actors that could <b>contribute</b> to and/or <b>benefit from</b> the research? | X  | Yes   | <input type="checkbox"/>   | No |
| <b>General Objective</b>  | . The general objective is to inform sustainable agricultural practices and natural resource management in five manteqa in Northwest Afghanistan and to develop an initial understanding of community-level resilience by assessing the impact of drought on agriculture and natural resources (pastures, forests, fields, horticulture, water), estimating the drought exposure of the natural resources that agro-pastoral communities in the target area rely on, and assessing local community resilience to the adverse effects of drought on agriculture and agro-pastoral livelihoods   |   |  |    |
| <b>Specific Objective(s)</b>  | <p><b>Phase 1: Gather evidence on climate change projections, drought hazard, and estimate the exposure of fields, forests, pasture and horticulture to drought-related variables</b></p> <ol style="list-style-type: none"> <li>1. Characterise common agro-pastoral practices in the 5 manteqa.</li> <li>2. Describe current drought occurrences and estimate climate change trends relevant to the area.</li> <li>3. Assess the condition and drought exposure of natural resources (pastures, fields, horticulture, forests and water)</li> </ol> <p><b>Phase 2: Understand communities' resilience to the impact of drought on natural resources and agro-pastoral livelihoods.</b></p> <ol style="list-style-type: none"> <li>4. Identify vulnerabilities of the agro-pastoral communities and sub-groups including sharecroppers, women, farmers, pastoralists to drought.</li> </ol> |   |  |    |

|                                  |   |
|----------------------------------|---|
|                                  | <p>5. Identify the mitigation strategies and adaptive practices adopted by communities, and sub-groups, including sharecroppers, women, farmers pastoralists, to reduce the impact of drought on natural resources and related livelihoods.</p> <p><b>Phase 3: Identify mitigation measures and priority intervention areas (Acted-led)</b></p> <p>6. Identify opportunities for drought (risk) mitigation measures and priority intervention areas for non-governmental organisations (NGO).</p>   |
| <p><b>Research Questions</b></p> | <p><b>Phase 1: Gather evidence on climate change projections, drought hazard, and estimate the exposure of fields, forests, pasture and horticulture to drought-related variables</b></p> <p><b>1. What are common agro-pastoral practices in the 5 manteqa and wider region?</b></p> <ol style="list-style-type: none"> <li>1. What are the main livelihoods of the population?</li> <li>2. How is land and water for agro-pastoral purposes used and managed?</li> <li>3. What are the most commonly produced crops and what are the cropping seasons??</li> <li>4. What are the pastoral seasons and practices?</li> <li>5. What are commonly employed agricultural practices?</li> </ol> <p><b>2. What are the climate trends and climate change projections in the 5 manteqa and wider region?</b></p> <ol style="list-style-type: none"> <li>1. What past droughts and drought-like periods occurred in Afghanistan, and specifically the Northwest, in the past 10 years and how have they impacted agriculture, natural resources, and agro-pastoral livelihoods?</li> <li>2. What is the average temperature and precipitation, and what are the future projections, per manteqa?</li> <li>3. What is the drought season and growing season when calculated using climatic parameters?</li> <li>4. What interferences can be made between farmers' cropping calendar and the estimated drought season and growing season?</li> <li>5. How might climate change impact Northwest Afghanistan's natural resources and agriculture according to existing climate change projections?</li> </ol> <p><b>3. What is the condition and drought exposure of natural resources (water resources, fields, pastures and horticulture) in the 5 Manteqa?</b></p> <ol style="list-style-type: none"> <li>1. Which of the manteqa's fields, pastures and horticulture have been affected by drought?</li> <li>2. What is the vegetation health and which changes or trends are observed in the productivity of fields, pastures and horticulture?</li> <li>3. What is the extent of soil degradation, and what changes or trends are observed in the manteqas' fields, pastures and horticulture?</li> <li>4. What is the soil moisture level and which fields, pastures and horticulture are prone to soil dryness?</li> <li>5. What are the groundwater levels and surface water levels, and what changes are observed?</li> </ol> |

**Phase 2: Understand communities' resilience to the impact of drought on natural resources and agro-pastoral livelihoods.**

**5. What are communities' vulnerability to the adverse impact of drought on agro-pastoral livelihood and natural resources?**

1. What sensitivities to drought can be identified on the agro-pastoral livelihood of local communities?
2. What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods?
3. What practices and resources support the communities to prepare for, and adapt to, drought?
4. What main barriers prevent effective coping mechanisms and adaptive practices?
5. How may vulnerability and resilience differ between population groups (sharecroppers, women, farmers, pastoralists)?
6. What currently employed practices exacerbate communities' vulnerability to the impact of drought?
7. How does communities' knowledge of areas impacted by drought compare to the measured drought exposure and vegetation health?

**Phase 3: Identify mitigation measures and priority intervention areas (Acted-led)**

**7. What drought (risk) mitigation measures and priority intervention areas can be identified in the 5 manteqa?**

1. What currently employed practices and measures can be leveraged to mitigate the impact of drought in the future?
2. What practices and locations are recommended to adapt manteqa communities' and their natural resources to the drought?
3. In what ways can communities', NGOs and institutions lift the barriers that prevent effective coping mechanisms and adaptive practices?
4. What community practices and NGO interventions can be prioritized in the Manteqa?

|  |   |                              |                          |                            |
|--|---|------------------------------|--------------------------|----------------------------|
| <b>Geographic Coverage</b>                           | <ul style="list-style-type: none"> <li>• Alasha Wuloswali Manteqa, Markaz Hazrat-e-Sultan District, Samangan Province</li> <li>• Pump Khana Manteqa, Shiberghan District, Jawzjan Province</li> <li>• Saray Qala Manteqa, Khwaja Sabz Posh District, Faryab Province</li> <li>• Dasht-e-Laili Manteqa, Andkhoy District, Faryab Province</li> <li>• Shadian Manteqa, Nahr-e-Shadi District, Balkh Province</li> </ul> |                              |                          |                            |
| <b>Secondary data sources</b>                        | <i>See table 2</i>  |                              |                          |                            |
| <b>Population(s)</b><br><i>Select all that apply</i> | <input type="checkbox"/>  | IDPs in camp                 | <input type="checkbox"/> | IDPs in informal sites     |
|  | <input type="checkbox"/>  | IDPs in host communities     | <input type="checkbox"/> | IDPs [Other, Specify]      |
|  | <input type="checkbox"/>  | Refugees in camp             | <input type="checkbox"/> | Refugees in informal sites |
|  | <input type="checkbox"/>  | Refugees in host communities | <input type="checkbox"/> | Refugees [Other, Specify]  |

|   |                                     |  |                                     |  |                                     |  |
|---|-------------------------------------|--|-------------------------------------|--|-------------------------------------|--|
|   | <input checked="" type="checkbox"/> | Host communities   | <input type="checkbox"/>            | [Other, Specify]   |                                     |  |
| <b>Stratification</b><br><i>Select type(s) and enter number of strata</i>   | <input checked="" type="checkbox"/> | Geographical #:3<br>Population size per strata is known? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/>            | Group #: 3<br>Population size per strata is known? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/>            | [Other Specify] #: __<br>Population size per strata is known? <input type="checkbox"/> Yes <input type="checkbox"/> No |
| <b>Data collection tool(s)</b>  | <input type="checkbox"/>            | Structured (Quantitative)  | <input checked="" type="checkbox"/> | Semi-structured (Qualitative)  |                                     |  |
|   | <b>Sampling method</b>              |  |                                     | <b>Data collection method</b>  |                                     |  |
| <b>Semi-structured data collection tool (s) # 1</b><br><i>Select sampling and data collection method and specify target # interviews</i>  | <input checked="" type="checkbox"/> | Purposive  | <input checked="" type="checkbox"/> |  |                                     | Key informant interview (Target #): 10   |
|   | <input type="checkbox"/>            | Snowballing  | <input type="checkbox"/>            |  |                                     | Individual interview (Target #):_____  |
|   | <input type="checkbox"/>            | [Other, Specify]   | <input type="checkbox"/>            |  |                                     | Focus group discussion (Target #):_____  |
|   | <input type="checkbox"/>            |  | <input type="checkbox"/>            |  |                                     | [Other, Specify] (Target #):_____  |
| <b>Semi-structured data collection tool (s) # 2</b><br><i>Select sampling and data collection method and specify target # interviews</i><br><br><i>***If more than 2 structured tools please duplicate this row and complete for each tool.</i> | <input checked="" type="checkbox"/> | Purposive  | <input type="checkbox"/>            |  |                                     | Key informant interview (Target #):_____   |
|   | <input type="checkbox"/>            | Snowballing  | <input type="checkbox"/>            |  |                                     | Individual interview (Target #):_____  |
|   | <input type="checkbox"/>            | [Other, Specify]   | <input checked="" type="checkbox"/> |  |                                     | Focus group discussion (Target: 13   |
|   | <input type="checkbox"/>            |  | <input type="checkbox"/>            |  |                                     | [Other, Specify] (Target #):_____  |
| <b>Disaggregation by gender and age</b><br><i>Are you planning to conduct sex/age disaggregated analysis?</i>   | Gender                              |  |                                     | Age  |                                     |  |
|   | <input checked="" type="checkbox"/> | Yes  | <input type="checkbox"/>            | Yes  |                                     |  |
|   | <input type="checkbox"/>            | No   | <input checked="" type="checkbox"/> | No   |                                     |  |
| <b>Data management platform(s)</b>  | <input checked="" type="checkbox"/> | IMPACT   | <input type="checkbox"/>            | UNHCR  |                                     |  |
|   | <input type="checkbox"/>            | [Other, Specify]   |                                     |  |                                     |  |
| <b>Expected output type(s)</b>  | <input checked="" type="checkbox"/> | Situation overview #: 1  | <input type="checkbox"/>            | Report #: __   | <input checked="" type="checkbox"/> | Profile #: 5   |
|   | <input checked="" type="checkbox"/> | Presentation (Preliminary findings) #: 1   | <input type="checkbox"/>            | Presentation (Final) #: __   | <input type="checkbox"/>            | Factsheet #: __  |
|   | <input type="checkbox"/>            | Interactive dashboard #: _   | <input type="checkbox"/>            | Webmap #: __   | <input type="checkbox"/>            | Map #: __  |
|   | <input type="checkbox"/>            | [Other, Specify] #: __   |                                     |  |                                     |  |
| <b>Access</b>   | <input checked="" type="checkbox"/> | Public (available on REACH resource center and other humanitarian platforms)   |                                     |  |                                     |  |

|   |   |  |
|---|---|--|
|   | <input type="checkbox"/>                            | Restricted (bilateral dissemination only upon agreed dissemination list, no publication on REACH or other platforms) |
| <b>Visibility</b> <i>Specify which logos should be on outputs</i> | <b>AGORA</b>  |  |
|   | <b>Donor:</b> Norwegian Ministry of Foreign Affairs |  |
|   | <b>Coordination Framework:</b> NA                   |  |
|   | <b>Partners:</b> NA                                 |  |

## 2. Rationale

### 2.1 Background

Afghanistan is ranked as 5<sup>th</sup> country most at risk of natural hazards due to the high likeliness of natural disasters (earthquakes, floods, drought, etc.) coupled with the low resilience of households and institutions to mitigate or respond to such hazards.<sup>1</sup> These natural hazards devastate livelihoods, basic needs, natural resources, and the economy. For instance, a drought in 2018 reduced wheat production by over 60%, necessitating 550 million USD to feed the nation's livestock.<sup>2</sup> In recent years, drought severely impacted households' livelihoods, food security and access to safe water nationwide.<sup>3</sup> Afghanistan is likely to witness more of these shocks as climate change is projected to lead to more extreme weather events, heightening the risk of future droughts and floods.<sup>4</sup>

In agro-pastoral communities, natural resources and livelihoods are tightly linked and heavily impacted by drought, placing them at the centre of local drought mitigation strategies. While there is growing attention from international agencies on climate and disaster risk reduction, the role of agro-pastoralists and local adaptive and mitigative practices are poorly understood. This assessment responds to this gap, by assessing 5 agro-pastoral communities in Northwest Afghanistan, focusing on their exposure to drought, vulnerability, and resilience.

### 2.2 Intended impact

The United Nations Convention to Combat Desertification stipulates that effective drought risk reduction relies on three pillars. I) Drought monitoring and early warning, II) Addressing drought vulnerability and risk, III) Implementing measures to limit the impact of drought and respond better to drought. In Afghanistan, developments towards drought monitoring and early warning are ongoing. Notable REACH contributions channelled through the Assessment and Analysis Working Group include the Drought Monitoring Framework and Shocks Monitoring Index<sup>5</sup>, upcoming drought forecasting through the IMMAP Humanitarian Spatial Data Centre<sup>6</sup> and the National Agro-Ecological Zoning Dashboard<sup>7</sup> created by the Food and Agriculture Organisation (FAO) and Ministry of Agriculture, Irrigation and Livestock. This assessment is positioned within the second pillar, with the objective of adding a local understanding of drought impact and the vulnerability and resilience of communities, including land poor and women, to drought. Thereby, it advances existing knowledge on climate vulnerability.

Secondly, the assessment aims to inform future drought-response and drought-preparedness measures (Pillar III). This will be achieved primarily through the ongoing IMPACT-Acted partnership within the Sustainable Rural Development Programme (SRDP) V in Afghanistan, which promotes sustainable agricultural livelihoods. Evidence from this assessment may be integrated within the SRDP program and will help shape Acted's flagship pilot THRIVE<sup>8</sup>. Furthermore, the

<sup>1</sup> INFORM. [Global Risk Index](#). 2019

<sup>2</sup> World Bank. [Afghanistan Climate Risk Country Profile](#). 2020

<sup>3</sup> REACH. 2024. Compounding impact of drought on water needs in Afghanistan.

<sup>4</sup> World Bank. [Afghanistan Climate Risk Country Profile](#). 2020

<sup>5</sup> REACH Afghanistan. [Shock Monitoring Index](#).

REACH Afghanistan. [Comparative Drought Analysis Terms of Reference](#).

<sup>6</sup> [IMMAP Humanitarian Spatial Data Centre](#)

<sup>7</sup> [National Agro-ecological Zoning Atlas](#)

<sup>8</sup> THRIVE is an approach to achieve resilience in vulnerable, rural environments through a holistic approach. It focusses on nature-based solutions to restore ecosystems and achieve productivity, natural resource management, value chain development and economic integration.

assessment may be utilised by other NGOs and local authorities to inform program design. Furthermore, the initial understanding of coping mechanisms and resilience achieved through this assessment could support monitoring/early-warning systems and drought risk assessments in the future.

### 3. Methodology

#### 3.1 Methodology overview

This assessment aims to provide a deeper understanding of how drought affects natural resources in 5 manteqa and assess the factors that contribute to the resilience and vulnerability of agro-pastoral communities to drought. The analysis is exploratory and will not quantify vulnerability (e.g., allocating scores). The impact of drought will be explored through the lens of agriculture and natural resources, and subsequently the livelihood of households that rely on these. The impact of drought on other sectors, such as domestic water availability and hygienic practices, is excluded from the analysis. Similarly, the cascading impact of drought on other areas such as energy consumption, migration patterns, social structures, market prices, health, etc., are not included.

Data collection is divided into 3 phases:

- **Phase 1 - Drought Profile of 5 Manteqa:** Gather evidence on climate change projections, and drought hazard, and estimate the exposure of fields, forests, pasture and horticulture to drought-related variables through secondary data.
- **Phase 2 – Vulnerability Profile of 5 Manteqa:** Understand communities' vulnerability and resilience to the impact of drought on agriculture and pastures through semi-structured interviews with (livestock) farmers, including women and land poor, and with local experts
- **Phase 3 - Identify priority interventions:** Identify mitigation measures and priority intervention areas through an Acted-led round-table discussion.

Table 1: Methodology overview

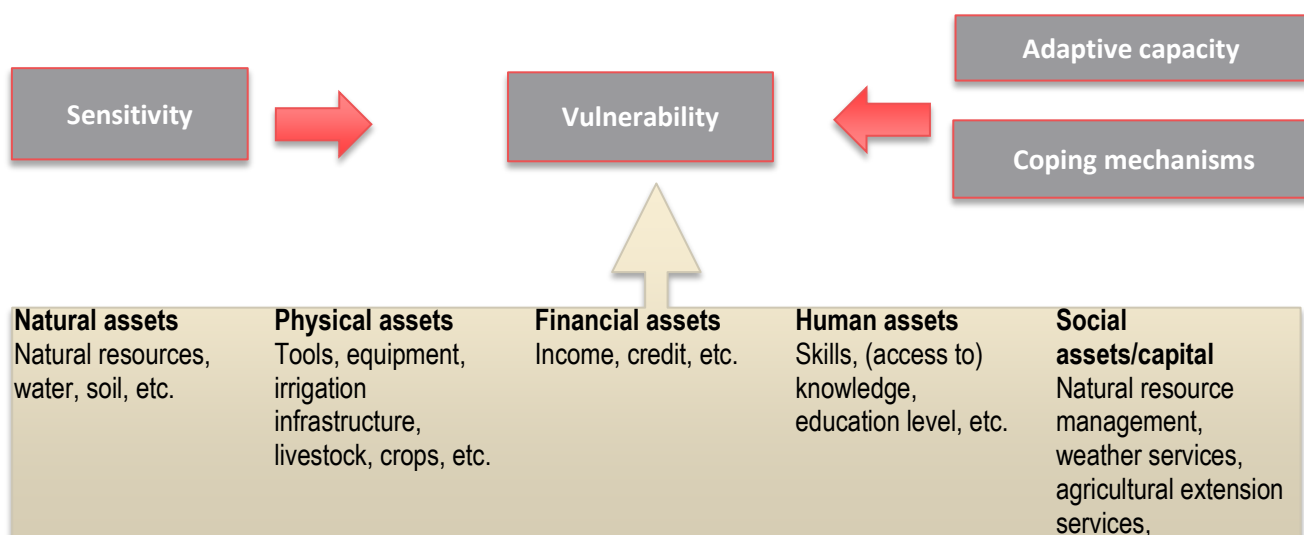
| Research question and phase  | Method                                  | Data source                 |
|--|---|-----------------------------|
| <b>Phase 1 – Drought profile of 5 manteqa</b>  |   |                             |
| RQ.1. What are common agricultural practices in the 5 manteqa and the wider region?  | Secondary data review                   | Secondary data              |
| RQ.2. What are the climate trends and climate change projections in the 5 Manteqa and the wider region?  | Secondary data review<br>Remote sensing | Secondary data              |
| RQ.3. <b>What is the condition and drought exposure of natural resources (water resources, fields, pastures and horticulture) in the 5 Manteqa?</b> fields, pastures and horticulture? | Secondary data review<br>Remote sensing | Secondary data              |
| <b>Phase 2 – Drought vulnerability profile of 5 mantqea</b>  |   |                             |
| RQ.5. What are the communities' vulnerabilities to drought, based on their perceived past impact of drought on their land and agro-pastoral livelihood?                                | Semi-structured interviews              | 10 key informant<br>13 FGDs |
| <b>Phase 3 – Identify intervention priorities</b>  |   |                             |
| RQ.7. What drought (risk) mitigation measures and priority intervention areas can be identified in the 5 manteqa?  | Round table                             | Key informants<br>(experts) |



## Analytical Framework for Vulnerability

Vulnerability is generally understood as a function of sensitivity, coping mechanisms and adaptive capacity.<sup>9</sup> Sensitivity reflects a system's susceptibility to drought impact, influenced by factors such as a dependency on surface water or water-intensive crops, or the extent of land degradation. Conversely, adaptive capacity is the ability of a system to adapt to drought or mitigate its adverse effects. Examples include communities' water storage capacity, access to finance, training, knowledge, and livelihood diversification. Coping mechanisms are strategies available to communities to offset (some of) the adverse impacts of a shock, such as selling livestock, seeking alternative livelihoods, or cultivating only a section of the available land. Coping mechanisms may be 'positive', reducing vulnerability, or 'negative' contributing to vulnerability in the long term (e.g. through depletion of resources). Resilient systems demonstrate high adaptive capacity, positive coping mechanisms and low sensitivity, while a vulnerable system displays the opposite. To capture the multitude of factors that may contribute to sensitivity, adaptive capacity, coping mechanisms, and ultimately, vulnerability, the Sustainable Livelihood Approach (SLA) is used. The SLA identifies five types of 'assets' that people draw upon to support their livelihoods: Human assets, social assets (also known as social capital), natural assets, physical assets and financial assets.<sup>10</sup>

Figure 1: Analytical framework.



### Definitions<sup>11</sup>:

- **Drought/Drought hazard:** A period of abnormally dry weather characterised by a prolonged deficiency of precipitation.
- **Drought exposure:** the people, infrastructure, property or system that are subject to potential losses due to drought.
- **Sensitivity/susceptibility:** the degree to which a system is susceptible to drought impact.

<sup>9</sup> United Nations Convention to Combat Desertification. [Drought Resilience, Adaptation and Management Policy Framework. Supporting Technical Guidelines](#). 2019

<sup>10</sup> The [sustainable livelihood approach](#) asserts that people utilise, combine and exchange 'assets' to maintain and develop their livelihoods. It offers a lens to identify the strategies employed by households to 'get by' and the strengths, weaknesses and sustainability of these strategies. By assessing different 'asset' types, including natural and social capital, the SLA recognises that vulnerability is a consequence of choices, abilities and the socio-economic, political and environmental context. The SLA offers participatory-tools built on positive language (e.g. strength and capacities rather than needs). It is an approach commonly used among academia, governments and NGOs.

<sup>11</sup> Adapted from IMPACT. [Disaster Risk Management and Climate Change Adaptation Glossary](#). Restricted access.



- **Coping capacity:** Coping capacity (or coping strategies/mechanisms) is the ability of people, organizations and systems, using available skills and resources, to manage and reduce negative consequences of drought. Coping strategies are short-term, oriented towards survival and are usually reactive to a shock. Negative coping strategies degrade a household's resource base and cause vulnerability in the long term.
- **Adaptive capacity:** The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities or to respond to consequences. Adaptation involves long-term planning, is oriented towards sustainable livelihood security, and uses resources efficiently and sustainably.
- **Drought vulnerability:** The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of drought. Vulnerability is a function of susceptibility/sensitivity, coping capacity and adaptive capacity.
- **Drought resilience:** The ability of a system, community or society exposed to drought to resist, absorb, accommodate, adapt to, transform and recover from the effects of a drought in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management. The components that contribute to resilience are: positive coping mechanisms and adaptive practices.

### 3.2 Population of interest

The population of interest are the agro-pastoral communities in 5 territories called the *manteqa*. 3 sub-groups are considered:

**Farmers and livestock farmers (male):** Men for which agriculture constitutes the main livelihood source. In case of farmers, *kan zamin* own land that they use for personal cultivation while *zamin motawasit* and *zamindamay* own larger amounts of land that are cultivated by themselves and/or by sharecroppers.

**Sharecroppers (male):** Sharecroppers (*Dehqan*) cultivate land after agreement with the landowner (*zamindar*). Sharecroppers usually belong to the lower classes of a community. Different agreements between Zamindar and Dehqan exist. In one agreement (*Nesfa Kari*) all expenses of input materials, such as machinery, seeds, and fertilisers and the profit of the yield are shared 50/50 between Zamindar and Dehqan. In another agreement, the Dehqan receives one-third (*sai yaka*) or one-fourth (*chahar yaka*) of the yield and the *Zamindar* covers the expenses of input materials. Other division agreements may exist and the distribution of shares differs between rainfed and irrigated land. Another set-up is *Ijara*, the sharecropper rents land of the Zamindar through a monetary payment rather than sharing the yield. Due to their lack of ownership and agreements made with the landowner, the resources available to sharecroppers to respond to drought may be different than farmers owning their own land.

**Farmers and livestock farmers (women):** Women have a distinctive role in agriculture, e.g. raising livestock, weeding control, and sometimes supporting with harvest and watering. Because of the distinct roles between men and women in both agriculture and the household, they may have different perceptions on drought impact, adaptation and coping strategies and different vulnerabilities.

The 5 *manteqa* targetted in this research are part of SRDP V implemented by Acted and IMPACT in Northwest Afghanistan.<sup>12</sup> The 5 *manteqa* were selected based on key informants' reports on soil erosion, forest degradation and pasture degradation, availability of communal land, access, and reliance on agricultural livelihoods, complemented with Acted field teams' knowledge of the area.

The *manteqa* are:

- Shadian Manteqa, Nahr-e-Shadi District, Balkh Province
- Alasha Wuloswali Manteqa, Markaz Hazrat-e-Sultan District, Samangan Province

<sup>12</sup> Balkh, Faryab, Jawzjan, Samangan Province

- Pump Khana Manteqa, Shiberghan District, Jawzjan Province
- Dasht-e-Laili Manteqa, Andkhoy District, Faryab Province
- Saray Qala Manteqa, Khwaja Sabz Posh District, Faryab Province

The **manteqa** is a geographic area containing a number of villages and is identified by both its inhabitants and the other inhabitants of the district under one common regional name. It is thus the basic reference point for the village population in the area. The manteqa boundaries are usually clearly defined by natural geographical features such as rivers, watersheds etc. IMPACT and Acted previously mapped and profiled Manteqa in Northwest Afghanistan and found that, beyond geographical boundaries, the existence of each of the assessed manteqa in the minds of its inhabitants stems from a feeling of belonging and attachment towards it, itself borne out of geographical proximity, common history, economic, social and tribal/ethnic ties, and the solidarity derived from the community management of some of the resources upon which rural livelihoods depend.<sup>13</sup> The customary governance structures that were found to exist at various levels within the manteqa play an important role in community resilience and resource management.

### 3.3 Secondary data collection

#### Phase 1: Gather evidence on climate change projections, and drought hazard, and estimate the exposure of fields forests pasture and horticulture to drought-related variables (Drought Profile)

During this phase, a drought exposure profile will be created for each of the 5 Manteqa. The drought profile will include secondary information through a context analysis of agricultural practices, livelihoods, and drought impact from different sources such as FAO, FEWSNET, and previously collected REACH data (Table 2). Drought exposure is commonly estimated through variables describing drought, such as special extent and frequency. A review of secondary data demonstrated that climate and drought-related indicators including previous analysis are available at country-level and district-level and these will be used to address the research questions. Additionally, to appraise an understanding of key drought-related variables at manteqa level, secondary data obtained from satellite imagery. The list of data sources from satellite imagery are listed in Table 3 and the corresponding Data Analysis Plan is found at the end of this document.

Table 2: Secondary sources used for drought exposure profile (excluding remote sensing)

| Purpose of source   | Secondary source   |
|---|--|
| Inform research objectives and methodology<br>Key definitions                       | United Nations Convention to Combat Desertification. <a href="#">Drought Resilience, Adaptation and Management Policy Framework. Supporting Technical Guidelines</a> . 2019<br>FAO <a href="#">Afghanistan Drought Risk Management Strategy</a> . 2020<br>CARE. <a href="#">Climate Vulnerability and Capacity Analysis Handbook</a> . 2009<br>OXFAM. <a href="#">The sustainable Livelihoods Handbook. An asset based approach to poverty</a> .                                     |
| RQ 1 –<br>What are common agricultural practices in the 5 Manteqa and wider region? | AGORA Afghanistan. <a href="#">Mapping and Profiling of Communities in Rural Manteqas and Urban Nahyias</a> . 2022.<br>FAO. <a href="#">Data in Emergencies Dashboard</a> .<br>FAO and International Institute for Applied Systems Analysis. <a href="#">Afghanistan's Agro-ecological zoning atlas. Part 2: Agro-ecological assessments</a> . 2019<br>FIEWSNET Afghanistan. <a href="#">Seasonal Monitor, Food Security Outlook, Acute Food Insecurity Classification (IPC).pop</a> |

<sup>13</sup> AGORA Afghanistan. [Mapping and Profiling of Communities in Rural Manteqas and Urban Nahyias](#). 2022

|  |  |
|--|--|
| <b>RQ 2. What are the climate trends and climate change projections in the 5 Manteqa and wider region?</b> | <p>REACH Real-Time Monitoring. 2024</p> <p>REACH Humanitarian Situation Monitoring. 2024</p> <p>REACH Whole of Afghanistan Assessment. 2023</p> <p>World Bank. <a href="#">Afghanistan Climate Risk Country Profile</a>. 2020</p> <p>World Bank. <a href="#">Afghanistan Disaster Risk Profile</a>. 2017.</p> <p>FAO and International Institute for Applied Systems Analysis. <a href="#">Afghanistan;s Agro-ecological zoning atlas. Part 1: Agro-climatic indicators</a>. 2019</p> <p>IMMAP. <a href="#">Humanitarian Spatial Data Center</a> Dashboard</p> |
|--|--|

Table 3 : Remote sensing data used for drought exposure profiles

| Indicator   | Format  | Scale   | Data range                    | Source  |
|---|---|---------|-------------------------------|---|
| Standardized Precipitation-Evapotranspiration Index             | Raster,<br>csv (long-term dataset per manteqa area) | 5 km    | 1981 to 2023                  | <a href="#">CHIRPS</a>                                      |
| Average temperature   | Raster<br>csv (long-term dataset per manteqa area)  | 11132 m | 1979 - 2023                   | <a href="#">ERA5</a>  |
| Land surface temperature (LST)                                  | Raster<br>csv (long-term dataset per manteqa area)  | 1 km    | 2001 - 2023                   | <a href="#">Modis LST</a>                                   |
| Normalized Difference Vegetation Index (NDVI)                   | Raster<br>csv (long-term dataset per manteqa area)  | 250 m   |                               | <a href="#">Modis NDVI</a>                                  |
| Vegetation Condition Index                                      | Raster  | 500 m   | 2001 - 2023                   | <a href="#">MODIS EVI</a><br><a href="#">Sentinel-2 MSI</a> |
| Normalized Difference in Water Index (in main water reservoirs) | Raster  | 30 m    | 1984 - 2023                   | Landsat <a href="#">5,7,8</a>                               |
| Normalized Difference Snow Index (NDSI)                         | Raster<br>csv (long-term dataset per manteqa area)  | 500 m   | 2001 - 2023                   | <a href="#">MODIS NDSI</a>                                  |
| Climate change projections                                      | Raster  | 1 km    | Historical 1970-2000 compared | <a href="#">WorldClim</a>                                   |

### 3.4 Primary Data Collection

#### Phase 1: Gather evidence on climate change projections, drought hazard, and estimate the exposure of fields forests pasture and horticulture to drought-related variables (drought profile)

No primary data collection.

#### Phase 2: Understand communities' resilience to the impact of drought on agriculture and pastures (vulnerability profile)

In this phase, semi-structured interviews will be held with local experts (agricultural extension providers, agronomists), using key informants interviews, and with members of the agro-pastoral community using focus group discussions. Using the secondary data collected in phase 1, notably the REACH Comparative Drought Analysis, the most recent drought period (max 2 years) will be identified and used as the reference example of 'drought' throughout the qualitative data collection, which will be validated by the participants. Although unlikely, in cases where the participant's definition of the last drought period differs, their definition will be used during the interview. The Sustainable Livelihood Approach (SLA) is used as a conceptual framework to develop the semi-structured interview guide, and structure the survey and FGD guide.

##### Semi-structured key informant interviews (KII)

First, two semi-structured key informant interviews with local experts will be conducted per manteqa, the interview includes a hazard mapping exercise.<sup>14</sup> Key informants will be purposively selected based on their expert knowledge of agriculture and pastoralism in the manteqa, the impact of drought on the area, drought risk reduction strategies, and communities' agricultural practices. The key informants will be sampled by IMPACT Senior Project Officer and Senior Field Officers in consultation with Acted Agriculture staff and the IMPACT Assessment team. If during these interviews a pressing theme is identified, which has not been included in the FGD survey tool, it will be added.

##### Semi-structured participatory focus group discussion (FGD)

The semi-structured participatory FGDs will be conducted with the target population. Participatory approaches were selected to encourage discussion in the FGDs: Hazard mapping, Livelihood Resource vulnerability Assessment and the Coping and Adaptation Strategies Assessment.<sup>15</sup> These tools consist of exercises that encourage discussion and joint analysis of drought hazard, vulnerability, coping mechanisms and adaptive practices. In each of the selected manteqa, one FGD with male farmers and livestock farmers will be held consisting of purposefully sampled participants: at least a *Zamindar*, *Zamindar motawasit*, *Kamzanim*, large-scale livestock farmer, small-scale livestock farmer and a member of the Natural Resource Management Committee.<sup>16</sup> An even distribution between farmers and livestock farmers is maintained. FGDs with sharecroppers will be conducted in three manteqa. Alasha Wuloswali and Dasth Laili manteqa are excluded, as sharecropping is not a commonly reported practice in these areas. FGDs with women are conducted in three manteqa, at least half of the women should be engaged in livestock farming and at least half in livestock farming. Where possible, female-headed households will be included in the sampling. Dasht Laili Manteqa was not sampled due to the limited engagement of women in agriculture while there was no access to women in Alasha Wuloswali. For all FGDs, participants from different villages will be sampled, ensuring a geographic even distribution of the manteqa.

<sup>14</sup> UK Aid & Livelihoods & Diversity Programme. [Participatory tools and techniques for assessing climate change impacts and exploring adaptation options](#). 2010

<sup>15</sup> UK Aid & Livelihoods & Diversity Programme. [Participatory tools and techniques for assessing climate change impacts and exploring adaptation options](#). 2010

<sup>16</sup> Committee established by Acted in 2023 tasked with protecting and maintaining a plot of pasture and tree saplings.

A pilot FGD will be held in one of the five manteqa to test the viability of the tool. If a pressing theme emerged during the KII that is not included in the semi-structured tool with community members, it will be included. Each FGD will consist of 8 participants selected from the above three population groups. FGDs are anticipated to take 2.5 hours with one moderator leading the discussion and one note-taker transcribing. Both moderators and notetakers will be experienced in facilitating FGDs, and where possible they will have affinity with the research topic. They will receive training from IMPACT assessment team prior to data collection, and a briefing on the agricultural practices and land use of each manteqa.

Table 4: Primary data collection sampling plan

| Province     | Manteqa          | FGD                       |                |          |           | Key informant |
|--------------|------------------|---------------------------|----------------|----------|-----------|---------------|
|              |                  | farmers/livestock farmers | Share-croppers | Women    | Total     |               |
| Faryab       | Dasht-e-Laili    | 1                         | -              | -        | 1         | 2             |
| Faryab       | Saray Qala       | 1                         | 1              | 1        | 3         | 2             |
| Samangan     | Alasha Wuloswali | 1                         | 1              |          | 2         | 2             |
| Jawzjan      | Pump Khana       | 1                         | 1              | 1        | 3         | 2             |
| Balkh        | Shadian          | 1                         |                | 1        | 3         | 2             |
| <b>Total</b> | 5                | <b>5</b>                  | <b>3</b>       | <b>3</b> | <b>12</b> | <b>10</b>     |

### Phase 3: Identify mitigation measures and priority intervention areas (Acted-led)

After completion of phase 2 and the creation of Manteqa-level outputs by IMPACT (see outputs), Acted will organise and facilitate a meeting or round-table discussion with relevant agricultural experts of the region. The purpose of the meeting is to identify opportunities for sustainable agricultural practices and feasible NGO interventions, based on the data collected in phases 1 and 2. Acted will lead phase 3. IMPACT will participate in the organised session, present findings and provide information where needed.

## 3.5 Data Processing & Analysis

### Phase 1: Gather evidence on climate change projections, and drought hazard, and estimate the exposure of fields forests pasture and horticulture to drought-related variables

The remote sensing analysis will leverage publicly available databases on different climate parameters through the last 20 years to understand how shifts and anomalies in climate patterns drive drought and how it affects the communities. These will be processed via the geospatial processing service, Google Earth Engine (GEE).

To define the drought-prone areas in each of the manteqa, the drought severity index will be calculated by equally weighting the long-term Vegetation Condition Index (VCI) and Standard Precipitation Index (SPI) spanning from 2003 to 2023, the Vegetation Health Index (VHI) during the drought period in 2023, and the 12-month Standardized Precipitation Index (SPI) of 2023. The Vegetation Condition Index (VCI) highlights the impacts of drought on vegetation health (greenness) by detecting the areas prone to drought based on a 20-year anomaly of satellite-derived vegetation index ([MODIS EVI](#)). MODIS Normalized differentiated vegetation index ([NDVI](#)) and MODIS Land Surface Temperature ([LST](#)) data are used to calculate the VHI during the drought period to highlight the drought manifestation and impact in the last drought event. The SPI index reflects the precipitation anomalies during 2023 compared to long-term observations based on CHIRPS datasets ([link](#)). The analysis is run for croplands, forests and rangelands using Copernicus land cover data ([link](#)).

The land use/cover changes between 2003 and 2023 will be intersected to show land use size changes due to drought, this analysis will supplement the drought severity index in depicting the impacts of drought and the adaptation of communities within the affected Manteqa.

## **Phase 2: Understand communities' resilience to the impact of drought on agriculture and pastures.**

Primary data will be collected by taking notes and by using an audio recorder. Debriefs will be held with facilitators after each FGD and KII to identify possible data quality issues (misunderstood questions, off-target answers, missed questions). Facilitators share full transcripts with the Senior Project Officer in Mazar. All qualitative data will be translated into English without paraphrasing or summarizing. Using a data saturation grid, a content analysis will be conducted for each manteqa and at the level of five manteqas. While addressing the research questions, the aim is to identify themes, patterns and relationships. After the data saturation grid is completed, the content analysis will be used to inductively fill a matrix with factors contributing to sensitivity, and with coping mechanisms and adaptive practices for each manteqa. The information on climate, drought exposure and the overall socio-economic situation of the manteqa that is gathered in phase 1 will be used to appraise the sensitivity of communities and natural resources to drought and the relevancy of adaptation strategies and will be used for contextualisation. Data processing and analysis follows the IMPACT Minimum Standards for Semi-Structured Data Processing and Analysis.

### **Output Production:**

The expected outputs are as follows:

2 x Anonymized transcripts

1 x Data saturation grid

1 x 5 manteqa profiles

1 x Assessment-level situation overview

1 x Recommendations brief (Acted)

Each **manteqa profile** will include maps showing essential variables to indicate drought exposure on natural resources and a summary of the agricultural practices and climate projections (phase 1/secondary data). Each profile will contain a table highlighting sensitivities, coping mechanisms and adaptive strategies, based on the qualitative data analysis. The manteqa profile will be available in English and Dari language.

The **assessment-level situation overview** is an English language output that will synthesize findings of the 5 manteqa to detail key sensitivities, adaptive capacities, and coping mechanisms, highlighting differences and similarities between manteqa and population groups.

The **recommendation brief** is a short document with recommendations obtained during phase 3 that will be drafted by Acted and constitutes an important complementary document to the manteqa profiles and situation overview.

If outputs are to be disseminated among the community, Acted will lead the production and dissemination of outputs for the local community, in line with Acted's direct experience working with the community. IMPACT will support technically where needed.

### **3.6 Limitations**

- Several ways in which drought affects natural resources and agriculture are left out of the analysis or are limited. Importantly, the interplay between drought-related variables and their consequences is unknown.
  - Notably, the impact of drought on ecosystems and biodiversity which are important components of a healthy natural environment.
  - This assessment lacks exact information about water availability and changes in the water regime. This is due to a lack of exact measurements on groundwater levels, streamflow or on the amount of runoff rainwater and snowmelt that is absorbed in the manteqa soil opposed to runoff water that leaves the

manteqa via streams. The available satellite data may not be applicable for analysis at manteqa level. For example, this could be a risk for groundwater level analysis. Consequentially, it might not be possible to conduct all planned analysis. Moreover, the scale of drought processes and their impacts are inherently large-scale and may not be fully relevant or detectable at the manteqa level.

- Conversely, local variability may negatively impact the accuracy of the data; small areas tend to have microclimates and topographical effects of hills and valleys can cause variations in vegetation and moisture that are not well-represented in a lower spatial resolution dataset. Similarly, the heterogeneity of vegetation and soil properties can be high making it challenging to obtain representative ground measurements that align with the satellite data.
- The available climate change predictions of Afghanistan should be treated with uncertainty as they are dependent on a multitude of factors, including the actual global warming rate (RRC). Moreover, these predictions are at the country-level or regional level, and scientists have noted that it is unsure how climate change might affect weather or climate-related hazards at the local level, such as the manteqa level. Although projections of temperature and precipitation can be made, it is uncertain how climate change will affect drought risk at manteqa level.
- Research scope is limited to natural resources and agriculture. The impact on other sectors, such as domestic water availability, and hygienic practices, are excluded from the analysis. Similarly, the cascading impact of drought on other areas such as energy consumption, migration patterns, social structures, market prices, health, etc., are not included.
- Drought is a commonly used word without always specifying the definition or being linked to exact measurements. This may lead to different interpretations of drought by KIIs, FGD participants and enumerators, which may negatively reflect on the validity of the data. For this research, the most recent drought period will be defined using REACH Comparative Drought Monitoring and the applicability of the selected period to the local population will be tested when asking participants to describe the most recent drought period. Discrepancies will be reported.
- Due to restrictions on women in the public sphere, training of female enumerators will be online. Although undesirable, the use of experienced enumerators, Senior Field Officer and regular debriefs aim to mitigate this constraint as much as possible.
- Due to reliance on qualitative methods, the collected data is not representative for the whole community.



## 4. Key ethical considerations and related risks

The proposed research design meets / does not meet the following criteria:

| <b><i>The proposed research design...</i></b>  | <b>Yes/ No</b> | <b><i>Details if no (including mitigation)</i></b> |
|--|----------------|--|
| ... Has been coordinated with relevant stakeholders to <b>avoid unnecessary duplication</b> of data collection efforts?  | Yes            |  |
| ... <b>Respects respondents, their rights and dignity</b> ( <i>specifically by: seeking informed consent, designing length of survey/ discussion while being considerate of participants' time, ensuring accurate reporting of information provided</i> )? | Yes            |  |
| ... Does not <b>expose data collectors to any risks as a direct result</b> of participation in data collection?  | Yes            |  |
| ... Does not <b>expose respondents / their communities to any risks as a direct result</b> of participation in data collection?  | Yes            |  |
| ... Does not involve <b>collecting information on specific topics which may be stressful and/ or re-traumatising</b> for research participants (both respondents and data collectors)?   | Yes            |  |
| ... Does not involve <b>data collection with minors</b> i.e. anyone less than 18 years old?  | Yes            |  |
| ... Does not involve <b>data collection with other vulnerable groups</b> e.g. persons with disabilities, victims/ survivors of protection incidents, etc.?   | Yes            |  |
| ... Follows IMPACT SOPs for management of <b>personally identifiable information</b> ?   | Yes            |  |

## 5. Roles and responsibilities

| <b>Task Description</b>              | <b>Responsible</b>        | <b>Accountable</b>                             | <b>Consulted</b>              | <b>Informed</b> |
|--------------------------------------|---------------------------|--|-------------------------------|-----------------|
| Research design                      | Senior Assessment Officer | Country Coordinator / Research manager         | Acted, IMPACT HQ              | NA              |
| Supervising data collection          | Senior Project Officer    | Program Manager                                | Assessment Officer            | NA              |
| Data processing (checking, cleaning) | Senior Project Officer    | Program Manager                                | Assessment Officer, IMPACT HQ | NA              |
| Data analysis                        | Assessment Officer        | Senior Assessment officer/<br>research manager | IMPACT HQ                     | NA              |
| Output production                    | Assessment Officer        | Senior Assessment officer/<br>research manager | IMPACT HQ                     | NAActed         |
| Dissemination                        | Assessment Officer        | Senior Assessment officer/<br>research manager |                               | Acted           |
| Monitoring & Evaluation              | Assessment Officer        | Senior Assessment officer/<br>research manager | Acted                         | NA              |
| Lessons learned                      | Assessment Officer        | Senior Assessment officer/<br>research manager | Acted<br>IMPACT HQ            | NA              |

**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

## 6. Data Analysis Plan

### REMOTE SENSING – DATA ANALYSIS PLAN

| Research questions  | Sub-question  | Indicator  | Data Source   | Disaggregation  | Time     | Limitation  | Desired output  |
|---|---|--|---|-----------------|----------|---|---|
| <b>2. What are the climate trends and climate change projections in the 5 manteqa and wider region?</b> | 2. What is the average temperature and precipitation, and what are the future projections, per manteqa? | Trends and variations in average temperature against 30-year long term mean and future projections   | Era5, Coupled Model Intercomparison Project (CMIP), CORDEX. | Manteqa         | 30 years | Spatial resolution of raster data may not give us the best results at Manteqa level                     | 1)Month graph (ex. <a href="#">Graph 1.1 p.4</a> )<br>2)Long-term climatic trend graph ( <a href="#">ex p.5</a> ).<br>3)Key projection on bioclimatic variables (raster and graph) ( <a href="#">ex p.5</a> ):<br>- |
| <b>2.What are the climate trends and climate change projections in the 5 Manteqa?</b>                   | 2. What is the average temperature and precipitation, and what are the future projections, per manteqa? | Trends and variations in average precipitation against 30-year long term mean and future projections | CHIRPS  | Local watershed | 30 years | Remote sensing data is available but supplementary local metrological data for Manteqa is not available | 1)Month graph (ex. <a href="#">Graph 1.1 p.4</a> )<br>2)Long-term climatic trend graph ( <a href="#">ex p.5</a> ).<br>3)Key projection on bioclimatic variable ( <a href="#">ex p.5</a> ):                          |

|  |  |  |   |                |                               |   |  |
|--|--|--|---|----------------|-------------------------------|---|--|
| <p><b>3.What is the condition and drought exposure of natural resources (water resources, fields, pastures and horticulture) in the 5 Manteqa?</b></p> | <p>1.Which of the Manteqa’s field, forest, pasture, horticulture have been affected by drought?</p>  | <p>Comparison of long term (24yrs) mean of NDVI, SPI, Soil moisture with 2024 mean or monthly mean.<br/>Landuse/landcover change</p> | <p>MODIS, Landsat, Sentinel</p>         | <p>Manteqa</p> | <p>Yearly (24 years)</p>      | <p>Cloud cover/</p>   | <p>Map (to identify areas with high drought severity overlayed with land use map. <a href="#">(ex. P.10)</a>)</p> <p>Figure; severity of drought on land (low/moderate/high/etc.), for lalmi, irrigated, forest, horticulture, pasture). <a href="#">(ex. P.10)</a>.</p> <p>Graph: SPI, NDVI and soil moisture over selected time period for irrigated land, rainfed land and pasture.</p> |
| <p><b>3.What is the condition and drought exposure of natural resources (water resources, fields, pastures and horticulture) in the 5 Manteqa?</b></p> | <p>2.What is the vegetation health, and which changes or trends are observed in the productivity of fields, pastures and horticulture?</p> | <p>Long term NDVI and SPI<br/>VCI and VHI</p>  | <p>Landsat<br/>Sentinel-2<br/>MODIS</p> | <p>Manteqa</p> | <p>Seasonal (2000 - 2024)</p> | <p>Atmospheric conditions (clouds, aerosols, and smoke)</p> | <p>Map (to identify areas with high productivity/low productivity) overlayed with land use map. <a href="#">(ex. P.10)</a></p> <p>Narrative description of trends.</p>   |
| <p><b>3.What is the condition and drought</b></p>  | <p>3. What is the extent of soil degradation, and</p>  | <p>Size of land with vegetation loss, land use/cover changes topographic</p>   | <p>SRTM digital elevation model</p>     |                |                               | <p>Remote sensing data may not be</p>                       | <p>Map (to identify areas with high degradation) overlayed with land use map. <a href="#">(ex. P.10)</a></p>   |

|  |   |   |  |                |                               |   |   |
|--|---|---|--|----------------|-------------------------------|---|---|
| <p><b>exposure of natural resources (water resources, fields, pastures and horticulture) in the 5 Manteqa?</b></p>                                     | <p>what changes or trends are observed in the manteqa's fields, pastures and horticulture?</p>  | <p>changes (flattening of slopes) changes in river course)</p>                | <p>Copernicus Proba-V Land cover<br/><br/>Global rainfall erosivity dataset</p>                | <p>Manteqa</p> | <p>Seasonal (2000 - 2024)</p> | <p>available for all areas or for all time periods. The spatial resolution of remote sensing data can limit the ability to detect small-scale soil degradation features</p> | <p>Figure; severity of soil degradation/topsoil loss on land (low/moderate/high/etc.), for lalmi, irrigated, forest, horticulture, pasture). (ex. <a href="#">P.10</a>).<br/><br/>Soil type map (if available)</p>  |
| <p><b>3.What is the condition and drought exposure of natural resources (water resources, fields, pastures and horticulture) in the 5 Manteqa?</b></p> | <p>4. What is the soil moisture level and which fields, pastures and horticulture <a href="#">experience are prone to</a> soil dryness?</p> | <p>Calculating soil moisture content, and Land surface temperature</p>        | <p>FLDAS_Soil_Moisture, SMAP (Soil Moisture Active Passive), Sentinel 1 and 2, MODIS (LST)</p> | <p>Manteqa</p> | <p>Monthly</p>                | <p>Microwave and thermal infrared remote sensing can be affected by factors other than soil moisture, such as soil texture and surface roughness.</p>                       | <p>Map to identify areas with high/low moisture, overlaid with landuse map.<br/><br/>Figure; Level of soil moisture content (low/moderate/high/etc.), for lalmi, irrigated, forest, horticulture, pasture). (ex. <a href="#">P.10</a>).<br/><br/>Graph: Soil moisture, precipitation and surface temperature.</p> |
| <p><b>3.What is the condition and</b></p>  | <p>5. What are the groundwater levels and</p>   | <p>Mapping the changes in surface water occurrence, two (or more) similar</p> |  |                |                               | <p>RS methods can only</p>  | <p>Graph; change in river water level per month for set of</p>  |

|  |  |  |  |                |                           |   |  |
|--|--|--|--|----------------|---------------------------|---|--|
| <p><b>drought exposure of natural resources (water resources, fields, pastures and horticulture) in the 5 Manteqa?</b></p>                             | <p>surface water levels, and what changes are observed?</p>  | <p>periods of time have to be identified to enable accurate comparison of data.</p>  | <p>Sentinel 1, 2<br/>Landsat</p>                                   | <p>Manteqa</p> | <p>Monthly (20 years)</p> | <p>measure the surface elevation of water bodies, not their depth.<br/>Water quality</p>  | <p>reference years. (<a href="#">ex. p.15 graph 1 and 2</a>).</p>  |
| <p><b>3.What is the condition and drought exposure of natural resources (water resources, fields, pastures and horticulture) in the 5 Manteqa?</b></p> | <p>5. What are the groundwater levels and surface water levels, and what changes are observed?</p> | <p>Ground storage trends, Recharge and discharge patterns from Precipitation and evapotranspiration, Land use impact<br/><br/>It is related to secondary data if it is available</p> | <p>GRACE (Gravity Recovery and Climate Experiment) data trends</p> | <p>manteqa</p> | <p>20 years</p>           | <p>Spatial and spectral resolution of the available data may not be viable for use at Manteqa level, No known historic ground water monitoring well to supplement Remote sensing data</p> | <p>Table</p>   |
| <p><b>2. What are the climate trends and climate</b></p>   | <p><a href="#">3.What is the drought season and growing season when calculated</a></p>             | <p>SPI<br/>VHI</p>   | <p>MODIS</p>   | <p>manteqa</p> | <p>Monthly and</p>        |   | <p>Seasonal calendar;<br/><br/> <ul style="list-style-type: none"> <li>• rain period,</li> <li>• dry period,</li> </ul> </p> |

|  |   |  |   |                |                               |                    |   |
|--|---|--|---|----------------|-------------------------------|--------------------|---|
| <p><b>change projections in the 5 manteqa and wider region?</b></p>  | <p><a href="#">using climatic parameters?</a></p>   | <p>Land Surface Temperature (LST)</p>        | <p>Global Precipitation Measurement (GPM)</p> |                | <p>yearly 24 years</p>        |                    | <ul style="list-style-type: none"> <li>• domination period (frost periods)</li> <li>• Calculate germination period for 3 most common crops</li> <li>• Calculate vegetation/growing period for 3 most common crops</li> </ul>  |
| <p><b>2. What are the climate trends and climate change projections in the 5 manteqa and wider region?</b></p> | <p><a href="#">3.What is the drought season and growing season when calculated using climatic parameters?</a></p> | <p>NDVI<br/>Time-Series Analysis of NDVI</p> | <p>Landsat<br/>Sentinel-2<br/>MODIS</p>       | <p>Manteqa</p> | <p>Seasonal (2000 - 2024)</p> | <p>Cloud cover</p> | <p>Seasonal calendar;</p> <ul style="list-style-type: none"> <li>• rain period,</li> <li>• dry period,</li> <li>• domination period (frost periods)</li> <li>• Calculate germination period for 3 most common crops</li> <li>• Calculate vegetation/growing period for 3 most common crops</li> </ul> |



**DATA ANALYSIS PLAN: SEMI-STRUCTURED FGD WITH COMMUNITY MEMBERS (FARMERS AND LIVESTOCK FARMERS)**

**RQ.6 What are communities' vulnerability to the adverse impact of drought on agro-pastoral livelihood and natural resources**

Welcome and thank you for agreeing to take part in this discussion. We really appreciate your time. You have been asked to participate due to your engagement as agriculturalists and pastoralists and would like to understand your point of view. Our names are [names] and we are here on behalf of the organisation REACH. We are conducting research to better understand how this manteqa has been impacted by drought and what resources exist within the community to respond to drought. We will ask questions about the impact of past drought, how farmers and livestock farmers have coped with drought, and what barriers they face in this regard. This data collection may be used by Acted to design future projects around livelihoods and sustainable natural resource management. Your participation is voluntary and the resulting report will be anonymous, with no reference to you as individuals or who participated in the FGD. This FGD will take approximately 3 hours.

**Do you all provide your consent to participate in this discussion?**

Rules

- The most important rule is that only one person speaks at a time. There may be a temptation to jump in when someone is talking but please wait until they have finished. There are no right or wrong answers and we all bring different perspectives and experiences.
- You do not have to speak in any particular order. When you do have something to say, please do so. There are many of you in the group and it is very important that we obtain the views of each of you.
- You do not have to agree with the views of other people in the group but we should all agree to voice our opinions respectfully.

Does anyone have any questions? (answers)

With this in mind, may we record the discussion to help us remember key points later? All recordings and documents will be kept safe and confidential and only shared with essential staff for analysis. (if yes, the note-taker should switch on the recorder).

| Sub-question | Questionnaire QUESTION   | Probes   |
|--------------|--|--|
|              | We will start by describing the most recent drought. When was this period and how does a drought year differ from a period with 'normal' rainfall? | <p><i>How does the rainfall amount and period (months) differ between a drought year and a normal year?</i></p> <p><i>Are there particular natural hazards, or weather events, that usually occur during a drought period?</i></p> |

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| <p><b>1. What practices and resources support the communities to prepare for, and adapt to, drought?</b></p>   | <p>What signs or warnings indicate the onset of a drought?</p>  | <p><i>Warning from government or NGOs?</i></p> <p><i>Weather forecast?</i></p> <p><i>Changes in rainfall, snowfall or surface water?</i></p> <p><i>Changes in plant behaviours (e.g., fewer blossoms, smaller crops, thicker stems, etc.)?</i></p>  |
| <p><b>7. How does communities' knowledge of areas impacted by drought compare to the measured drought exposure and vegetation health?</b></p> <p><b>1. What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b></p> | <p>We have prepared maps that we will work with today. The maps already include some key services, infrastructure, and the location of pastures, lalmi land, irrigated land, horticulture and non-arable land.</p> <p>We would like to understand how this [last drought year] impacted natural resources throughout the year, such as soil, vegetation and water. Can you encircle areas on the map that were affected by drought? Could you please describe the changes?</p> <p>I will save your responses on this flipchart, so we can return to it later.</p> | <p><b>Natural assets</b></p> <p>Did you observe areas where vegetation was less than usual?</p> <p>Did you observe areas where the soil was eroded or degraded?</p> <p>Did you observe changes in water resources?</p> <p>Did you observe changes in the ecosystem, e.g. to animal types, or wild plants?</p> |
|  | <p>Did you notice any locations or plants that were more impacted than others? If so, what do you think caused that?</p>  | <p><i>Were certain natural resources more vulnerable to drought than others?</i></p> <p><i>Where certain crops more affected than others?</i></p>   |
| <p><b>1. What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b></p>   | <p>We would like to understand how this [last drought year] impacted resources and agro-pastoral livelihoods throughout the year.</p> <p>You can answer the upcoming questions based on your own experience and based on the experience of people in the same situation as yourself. I will summarise your responses on this flipchart, so we can return to it later.</p>   | <p><b>Physical assets</b></p> <p>... livestock health, and herd size</p> <p>... crops conditions (growth, disease, etc.)</p> <p><b>Financial assets</b></p> <p>..... sales of agricultural and livestock products</p> <p>..... earned income</p>  |

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|   | In what ways did drought impact the physical assets, such as produce, livestock and infrastructure, and the financial situation of yourself and people in the same situation?          | .... ability to purchase on credit, take on debt  |
| <b>1.What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b>                          | Did drought affect your personal or community wellbeing of yourself or people in a similar situation? Or of people in similar situation as yourself If so, how?                        | <b>Human assets</b><br>Were there any changes in people's health due to the drought and the negative consequences of drought?<br>Were there changes in people's diet and food consumption as a consequence of drought?<br>Were there changes to people's ability to access to information and education?  |
|   | Did drought impact social relationships or trust among community members or towards institutions? If so, how?  | <b>Social assets</b><br>Did drought or its negative consequences change people's attitudes towards each other, or did it spark community tensions or conflict?  |
| <b>5.How may vulnerability and resilience differ between population groups (land poor, women)?</b>  | Considering the different impact of drought that we discussed, did this shock impact any members of your community differently than others? If so, how were they impacted differently? | <i>Community members who are more vulnerable, and therefore more impacted than others?</i>  |
| <b>2.What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods?</b> | Now, we will discuss how you and people in a similar situation coped with the impact of drought.<br><br>I will save your responses on this flipchart so we can return to it later.     | <b>Natural assets</b><br>To cope with drought, were there changes in the way people cultivated the land or grazed the land?<br>.... Grazing patterns / migrating livestock<br>.... Planting other varieties than usual<br>.... Sowing or harvesting at different period<br>.... Selling crops at different period<br>.... Protection soil quality through mulching (covering with plastic or organic material), shading |

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|  | <p>Again, you can answer the upcoming questions based on your own experience and based on the experience of people in the same situation as yourself.</p> <p><i>Coping mechanisms: changes the community make compared to an agricultural year where there is no drought. These are taken after a drought hit, and helped people to cope with the negative consequences of drought</i></p> | <p>To cope with drought, were there changes in the way people accessed or distributed water?</p> <p>.... Water for livestock watering</p> <p>.... Irrigation water</p> <p>.... Water source</p>   |
| <p><b>2.What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods?</b></p> | <p>What do you, or people in a similar situation, do to cope with the negative impact of drought?</p>  | <p><b>Physical assets</b></p> <p>To cope with drought, Were their changes in the way people utilised tools and input materials, such as medicine, fodder, fertilisers and pesticides?.</p>  |
| <p><b>2.What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods?</b></p> |  | <p><b>Financial assets</b></p> <p>To cope with drought, did people seek alternative income sources, due to the negative consequences of drought? (e.g. labour migration, taking on casual labour, taking loans, purchasing on credit, NGO support).</p> <p>To cope with drought, did people sell assets? (e.g. livestock, land, household items)</p> <p>To cope with drought, did people change their spending and purchasing patterns?</p> |
| <p><b>2.What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods?</b></p> |  | <p><b>Human asset</b></p> <p>To cope with drought, did people change the type of food they ate, or the frequency of meals?</p> <p>To cope with drought, were people forced to reduce the number of households in the family? (e.g. through marriage)</p> <p>To cope with drought, did people seek information from government, NGOs, or agricultural cooperations/companies, on how to deal with the drought?</p>                           |

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| <p><b>2.What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods? 3. What practices have communities adopted to protect natural resources and agro-pastoral livelihoods from future drought (adaptation)?</b></p> | <p>Have a look at the actions taken to cope with the negative affect of drought, and the actions taken to reduce the negative impact of drought in the future.</p> <p>Which of these actions are the first actions taken by yourself and people in a similar situation when faced with drought? Why are these actions done first?</p> | <p>Which actions are prioritised?</p>   |
| <p><b>4.What main barriers prevent effective coping mechanisms and adaptive practices?</b></p>   | <p>Which actions are the last actions taken by yourself and people in a similar situation? Why are they least prioritised?</p>  | <p>What actions are least prioritised?</p>  |
| <p><b>3. What practices have communities adopted to protect natural resources and agro-pastoral livelihoods from future drought (adaptation)?</b></p>  | <p>Now, we want to ask you about more permanent changes and adaptations made by yourself and people in a similar situation, that were not previously mentioned. For example, practices or changes that have been made now, with the intention of protecting natural</p>   | <p><b>Natural assets</b></p> <p>Have people taken measures to protect natural resources, such as soil, land or water, that are affected by drought? (e.g. cover cropping, tillage, contour farming, water harvesting, trenching)</p> <p>Have community members adapted the types of crops, or seeds, or have they made changes to their sowing or harvesting practices?</p> |

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|  | resources and agro-pastoral livelihoods from future droughts.  |  |
|  | For example, people might have permanently changed the types of crops and seeds, people might have invested in new water infrastructure. They might have permanently changed their income or access to finance, or introduced new ways of managing pastures and water. |  |
|  | What do you, or people in a similar situation, do to adapt to drought and protect natural resources and agro-pastoral livelihoods from future droughts, that were not previously discussed?  |  |
|  | <i>Adaptation: This can be changes or precautions made before a drought hits, or changes made to current practices or resources, to minimise the impact of drought in the future.</i>  |  |
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|  |  | <b>Physical assets</b>   |
|  |  | Have community members adapted the types of crops, or seeds, or have they made changes to their sowing or harvesting practices?                                    |
|  |  | Have people introduced new input materials, such as fodder, machinery, pesticides, veterinary medicine, or changed the way they use input materials?               |
|  |  | <b>Financial assets</b>  |
|  |  | Have community members permanently changed their livelihood, savings and income sources, due to reduce the impact of future drought?                               |
|  |  | <b>Human assets</b>  |
|  |  | Were there other ways in which people in the community increased needed knowledge and skills, with the purpose of preparing themselves better for future droughts? |
|  |  | <b>Social assets</b>   |
|  |  | Have new management and coordination initiatives emerged, to tackle future drought issues?   |
|  |  | Did community members adapt the way the community use or distribute natural resources, such as pasture or water?   |

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| <b>5.How may vulnerability and resilience differ between population groups (land poor, women)?</b> | Have you observed differences in the way community members or groups within the manteqa respond and cope with drought? If yes, what were the differences? | What strategies are available to some community members, but are not available to all households that needed them?<br><br>E.g. women-headed households, IDPs, pastoralists, sharecroppers, etc. |
|  | What caused these differences between groups?   |   |
| <b>4.What main barriers prevent effective coping mechanisms and adaptive practices?</b>            | What support do you and people in a similar situation need to better prepare for future droughts and protect your natural resources and livelihoods?      | E.g. support from government, NGOs or from community members to overcome difficulties?  |
|  | This was our last question. Is there anything that you would like to add to the subjects that we covered today, that we did not cover previously?         |   |



## DATA ANALYSIS PLAN: SEMI-STRUCTURED TOOL WITH KEY INFORMANTS (EXPERTS)

### RQ.6 What are communities' vulnerability to the adverse impact of drought on agro-pastoral livelihood and natural resources

Welcome and thank you for agreeing to take part in this interview. We really appreciate your time. You have been asked to participate due to your expertise in agriculture, including pastoralism, in [manteqa name]. Our names are [names] and we are here on behalf of the organisations REACH. We are conducting research to better understand how this manteqa has been impacted by drought and what resources exist within the community to respond to drought. We will ask questions about the impact of past drought, how farmers and livestock farmers have coped with drought, and what barriers they face in this regard. This data collection may be used by Acted to design future projects around livelihoods and sustainable natural resource management. Your contributions are voluntary and will be anonymous. We expect that this interview will take around 1 hour.

#### Do you all provide your consent to participate in this discussion?

With this in mind, may we record the discussion to help us remember key points later? All recordings and documents will be kept safe and confidential and only shared with essential staff for analysis. (if yes, the note-taker should switch on the recorder). If you would like to receive the report REACH will create following the data collection, please say your email address.

We will start the interview. All the questions we will be asking you refer specifically to [manteqa name].

| Sub-question   | Questionnaire QUESTION   | Probes   |
|--|--|--|
| <b>1.What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b> | Considering the last [drought period], could you describe how drought impacted natural resources in the [manteqa name]?  | e.g. water availability, conditions of pastures, crops and soil quality in the manteqa?  |
| <b>7.How does communities' knowledge of areas impacted by drought compare to the measured drought exposure and vegetation health?</b>        | Were there specific areas or species more impacted than others?<br><br>If there is a specific area that you know was more affected than others, could you highlight these on the map?                            | Were certain fields or lands more impacted by drought than others? E.g.... pastures .... Horticulture .... Forests .... Lalmi land ... irrigated land<br><br>Were certain plants or species more impacted than others? .... plants and species for foraging, e.g. Cumin, heng .... cereals .... vegetables |
| <b>6.What currently employed practices exacerbate communities' vulnerability to the impact of drought?</b>                                   | Considering the way the natural environment is affected, can you think of practices or circumstances of households or the manteqa community that may have contributed to these negative consequences of drought? |  |

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| <p><b>1.What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b></p> | <p>What was the impact the drought had on the farmers and livestock farmers in [manteqa name]? As drought may impact many different areas, we would like to start by the impact it had on crops and livestock?</p> | <p><b>Physical assets</b></p> <p>...crop condition</p> <p>...livestock health</p>  |
| <p><b>1.What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b></p> | <p>How did the drought year affect the income and financial resources of households?</p>   | <p><b>Financial assets</b></p> <p>..... sales of agricultural and livestock products</p> <p>..... earned income</p> <p>.... ability to purchase on credit, take on debt</p>  |
| <p><b>6.What currently employed practices exacerbate communities' vulnerability to the impact of drought?</b></p>                                   | <p>What practices and assets of the individual households and the manteqa community may have contributed to these negative consequences of drought?</p>  | <p>.... Certain input materials used that are harmful or ineffective?</p> <p>.... Unsustainable or wasteful use of natural resources?</p> <p>.....lack of access to required assets or finances</p>  |
| <p><b>1.What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b></p> | <p>How did drought impact people's health, education and wellbeing?</p>  | <p><b>Human assets</b></p> <p>Were there any changes in people's health due to the drought and the negative consequences of drought?</p> <p>Were there changes to people's ability to access information and education?</p> <p>Were there changes in the way people used or perceived information, such as weather information, or agricultural provided by the government or NGOs</p> |

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| <p><b>1.What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b></p>                          | <p>How did drought impact social relationships or trust among community members or towards institutions?</p>  | <p><b>Social assets</b></p> <p>... did drought and its impact spark disagreements between community members?</p> <p>.... Did people interact differently with agricultural extension services, NGOs or government?</p>   |
| <p><b>6.What currently employed practices exacerbate communities' vulnerability to the impact of drought?</b></p>  | <p>Considering these human and social impacts, what practices or circumstances of the individual households and the manteqa community may have contributed to these negative consequences of drought?</p>   | <p>... E.g. considering the way people use and manage natural resources (e.g. land, water)</p>   |
| <p><b>1.What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b></p>                          | <p>What are other direct impacts of drought in the [manteqa name], that we did not discuss yet?</p>   |  |
| <p><b>2.What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods?</b></p> | <p>What did farmers in the manteqa do to cope with the negative impact of drought on their crops and agricultural land? This refers to actions taken after a drought hit.</p> <p><i>Coping mechanisms: changes the community make compared to an agricultural year where there is no drought. These are taken after a drought hit and helped people to cope with the negative consequences of drought</i></p> | <p>To cope with drought, were there changes in the way people used land or cultivated the land?</p> <p>.... Grazing patterns</p> <p>.... Planting other varieties or less land</p> <p>.... Sowing or harvesting at different period</p> <p>.... Using pesticides or fertilisers differently</p> <p>....irrigated differently</p> |

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|  | <p>What did farmers in the manteqa do to cope with the negative impact of drought on their livestock and pastures? This refers to actions taken after a drought hit.</p>  | <p>Were there changes in the way people</p> <ul style="list-style-type: none"> <li>.... Watered livestock</li> <li>.... Used pastures</li> <li>.... Used animal fodder, medicine or other input materials</li> </ul>   |
| <p><b>2.What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods?</b></p> | <p>What did farmers and livestock farmers in the manteqa do to cope with the loss of livelihood and income? This refers to actions taken after a drought hit.</p>   | <p><b>Financial assets</b></p> <p>Did people seek alternative income sources, due to the negative consequences of drought? (e.g. labour migration, taking on casual labour, taking loans, purchasing on credit, NGO support).</p> <p>Did people sell assets? (e.g. livestock, land, household items)</p> <p>Did people change their spending and purchasing patterns? If so, what changes did they make?</p> |
| <p><b>2.What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods?</b></p> | <p>What other coping strategies that negatively impact people's health, wellbeing and education did you observe, that have not yet been discussed?</p> <p>This refers to actions taken after a drought hit.</p> | <p><b>Human asset</b></p> <p>were children taken out of schools, to reduce spending?</p> <p>did people change the type of food they ate, or the frequency of meals?</p> <p>were people forced to reduce the number of households in the family? (e.g. through marriage)</p>  |

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| <p><b>2.What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods?</b></p> | <p>To cope with drought, did people in [manteqa name] seek information or training from government, NGOs, or agricultural organisations? If so, which organisation did they refer to and for what purpose?</p>   | <p><b>Human asset</b></p> <p>E.g. information on how to protect crops and pasture from drought, on how to prevent livestock loss, water waste, etc.</p>   |
| <p><b>2.What coping mechanisms have been adopted by communities to mitigate the adverse effects of drought on their natural resources and agro-pastoral livelihoods?</b></p> | <p>To cope with drought, what changes did you observe in the way people organise themselves or work together? ?</p> <p>This refers to actions taken after a drought hit.</p>   | <p><b>Social asset</b></p> <p>did people seek information from the government, NGOs, or agricultural cooperations/companies, on how to deal with the drought?</p> <p>did community members organise Shuras or establish committees, that would otherwise not have happened?</p> <p>were social events organised, such as Ashar?</p> |
| <p><b>5.How may vulnerability and resilience differ between population groups (land poor, women)?</b></p>  | <p>How widely have these coping strategies been adopted across the manteqa? Are there any areas or group(s) of people that did not adopt these practices, why not?</p> <p>What causes the differences in available strategies between these groups?</p>  | <p>Were there groups that relied on a coping strategy, but this action was not feasible for other members of the community?</p> <p>E.g. women-headed households, IDPs, pastoralists, sharecroppers, etc.</p>  |
| <p><b>3.What practices have communities adopted to protect natural resources and agro-pastoral livelihoods from future drought (adaptation)?</b></p>                         | <p>Now, we would like to discuss adaptive practices of the community. These are changes or precautions made before a drought hits, or changes made to current practices or resources, to minimise the impact of drought in the future.</p> <p>To better adapt to future drought, did people in the manteqa take permanent measures to reduce the risk of soil erosion, desertification or water wastage? What were these measures?</p> | <p>Did community members invest in new infrastructure, such as infrastructure that improves accessibility to water? (e.g. water harvesting systems, canals, etc.)</p> <p>Have people taken measures to reduce the possibility that soil erodes or degrades, due to drought? (e.g. cover cropping, tillage, contour farming)</p>     |

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|   | <i>Adaptation: This can be changes or precautions made before a drought hits, or changes made to current practices or resources, to minimise the impact of drought in the future.</i> |   |
| <b>3.What practices have communities adopted to protect natural resources and agro-pastoral livelihoods from future drought (adaptation)?</b> | What adaptations have people in [manteqa name] made to the way they farm and ranch livestock, to better adapt and prepare for future drought?   | <p>Have people adapted the ways they use input materials, or the type of input materials used? (e.g. fodder, machinery, pesticides, fertilisers, medicine)</p> <p>Have community members adapted types of crops, or seeds, planted?</p> <p>Did community members adapted the way the community use or distribute natural resources, such as pasture or water?</p>   |
| <b>3.What practices have communities adopted to protect natural resources and agro-pastoral livelihoods from future drought (adaptation)?</b> | What changes have people in [manteqa name] made to their income sources, or way they earn income, to better adapt and prepare for future drought?                                     | <p><b>Financial assets</b></p> <p>Have community members made changes to their livelihood and income sources, due to reduce the impact of future drought?</p> <p>Have community members taken measures to increase their savings? (e.g. micro-finance, saving groups)</p>   |
| <b>3.What practices have communities adopted to protect natural resources and agro-pastoral livelihoods from future drought (adaptation)?</b> | Have people in the manteqa learned new skills or sought for training or information, to better adapt and prepare for future drought? If so, what did they do?                         | <p><b>Human assets</b></p> <p>Have community members used weather forecasts or early warnings to inform themselves of future drought?</p> <p>Did community members access agricultural extension services, such as information services from the government, NGOs, to prepare themselves better for future drought?</p> <p>Were there other ways in which people in the community increased needed knowledge and skills, with the purpose of preparing themselves better for future droughts?</p> |

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| <p><b>3.What practices have communities adopted to protect natural resources and agro-pastoral livelihoods from future drought (adaptation)?</b></p> | <p>To better adapt and prepare for drought, have people in the manteqa changed the way they organise themselves or collectively manage natural resources? If so, can you describe these changes?</p> | <p><b>Social assets</b></p> <p>Have new management and coordination groups emerged, to tackle future drought issues?</p> <p>What new strategies emerged to manage and maintain water, pastures and fields?</p>  |
| <p><b>3.What practices have communities adopted to protect natural resources and agro-pastoral livelihoods from future drought (adaptation)?</b></p> | <p>In your opinion, which of these practices and measures that we discussed were particularly successful?</p>  | <p>What made them succesful?</p>  |
| <p><b>5.How may vulnerability and resilience differ between population groups (land poor, women)?</b></p>  | <p>Consider how widely have these adaptive strategies been adopted across the manteqa. Are there any group(s) of people that did not adopt these practices and why did or could they not?</p>        | <p>What adaptive practices are available to some community members, but iare not available to all households that needed them?</p> <p>E.g. women-headed households, IDPs, pastoralists, sharecroppers, etc.</p> |
|  | <p>What causes the differences in available strategies between these groups?</p>   |   |
| <p><b>4.What main barriers prevent effective coping mechanisms and adaptive practices?</b></p>   | <p>Are you aware of any adaptations or coping mechanisms that farmers or livestock farmers attempted to implement, but they failed? If so, why did they fail?</p>                                    |   |

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| <p><b>4.What main barriers prevent effective coping mechanisms and adaptive practices?</b></p>   | <p>What support households or the community in [manteqa name] require to better prepare for future droughts and protect your natural resources and livelihoods?</p> <p>Consider household-level , community-level , and institutional support.</p> | <p>What is preventing people in [manteqa name] to effectively respond to drought and reduce the negative impact of drought in the future?</p>  |
| <p><b>5.How may vulnerability and resilience differ between population groups (land poor, women)?</b></p>  | <p>What differences exist in the type of barriers, and the severity of the barrier, between different groups and households in the manteqa?</p>  | <p>Were certain barriers more salient to some household members, but not to others?</p> <p>E.g. women-headed households, IDPs, pastoralists, sharecroppers, etc.</p>                               |
| <p><b>1.What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b></p>  | <p>What external resources and services are available to farmers and livestock farmers that could help them to respond or prepare to drought?</p>  | <p>... Information services, such as weather forecasts, drought warnings, or agricultural extension services</p> <p>.... Agricultural input materials and tools</p> <p>.... Financial services</p> |
| <p><b>1.What sensitivities to drought can be identified, based on past drought impact on the agro-pastoral livelihood of local communities?</b></p>  | <p>Are they used? If not, why not?</p>   |  |
| <p><b>3.What practices have communities adopted to protect natural resources and agro-pastoral livelihoods from future drought (adaptation)?</b></p> | <p>If used, who in the community uses these resources? What groups do not have taccess to these resources and whyhy not?</p>   | <p>What of the mentioned resources are available to some community members, but are not available to all households that needed them?</p>  |



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| <p><b>3.What practices have communities adopted to protect natural resources and agro-pastoral livelihoods from future drought (adaptation)?</b></p> | <p>What are some adaptive practices that communities in this mantega could employ <i>today, with their current resources</i>, to protect their natural resources and agro pastoral livelihoods from future drought?</p> |  |
|  | <p>This was our last question. Would you like to add anything to the topics we discussed, that was not previously mentioned?</p>  |  |

## 7. Monitoring & Evaluation Plan

| IMPACT Objective   | External M&E Indicator  | Internal M&E Indicator   | Focal point           | Tool          | Will indicator be tracked?   |
|--|---|--|-----------------------|---------------|--|
| <b>Humanitarian stakeholders are accessing IMPACT products</b>   | Number of humanitarian organisations accessing IMPACT services/products<br><br>Number of individuals accessing IMPACT services/products | # of downloads of x product from Resource Center                                   | Country request to HQ | User_log      | <input checked="" type="checkbox"/> Yes  |
|  |   | # of downloads of x product from Relief Web  | Country request to HQ |               | <input type="checkbox"/> Yes   |
|  |   | # of downloads of x product from Country level platforms                           | Country team          |               | <input checked="" type="checkbox"/> Yes  |
|  |   | # of page clicks on x product from REACH global newsletter                         | Country request to HQ |               | <input type="checkbox"/> Yes   |
|  |   | # of page clicks on x product from country newsletter, sendingBlue, bit.ly         | Country team          |               | <input type="checkbox"/> Yes   |
|  |   | # of visits to x webmap/x dashboard  | Country request to HQ |               | <input type="checkbox"/> Yes   |
| <b>IMPACT activities contribute to better program implementation and coordination of the humanitarian response</b> | Number of humanitarian organisations utilizing IMPACT services/products   | # references in HPC documents (HNO, SRP, Flash appeals, Cluster/sector strategies) | Country team          | Reference_log | <p><i>[List here relevant HPC-documents to be monitored:</i></p> <p><i>E.g. Iraq HNO 2018, Iraq Flash Appeal Mosul, Shelter Cluster strategy]</i></p> <p><i>Acted Afghanistan Programme Proposals,</i></p> |
|  |   | # references in single agency documents  |                       |               |  |

|   |  |   |              |   | Acted Afghanistan Programme SOPs/Documentation   |
|---|--|---|--------------|---|--|
| <b>Humanitarian stakeholders are using IMPACT products</b>                                    | Humanitarian actors use IMPACT evidence/products as a basis for decision making, aid planning and delivery   | Perceived relevance of IMPACT country-programs  | Country team | Usage_Feed back and Usage_Survey template | <i>Usage survey or semi-structured interviews with Acted Afghanistan programme staff</i> |
|   |  | Perceived usefulness and influence of IMPACT outputs  |              |   |  |
|   | Recommendations to strengthen IMPACT programs  |   |              |   |  |
|   | Perceived capacity of IMPACT staff   |   |              |   |  |
|   | Perceived quality of outputs/programs  |   |              |   |  |
|   | Number of humanitarian documents (HNO, HRP, cluster/agency strategic plans, etc.) directly informed by IMPACT products   | Recommendations to strengthen IMPACT programs   |              |   |  |
| <b>Humanitarian stakeholders are engaged in IMPACT programs throughout the research cycle</b> | Number and/or percentage of humanitarian organizations directly contributing to IMPACT programs ( <i>providing resources, participating to presentations, etc.</i> ) | # of organisations providing resources (i.e.staff, vehicles, meeting space, budget, etc.) for activity implementation | Country team | Engagement_log                            | <input type="checkbox"/> Yes   |
|   |  | # of organisations/clusters inputting in research design and joint analysis   |              |   | <input type="checkbox"/> Yes   |
|   |  | # of organisations/clusters attending briefings on findings;  |              |   | <input type="checkbox"/> Yes   |

