Drought Assessment In Afghanistan Central Highlands

Typical failed rainfed wheat crop, Chaghcharan District, June 2022

June 16th to July 9th, 2022

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Contents

Executive summary

Afghanistan is currently in the second year of severe drought conditions. To better inform the country program on the current situation and plan future humanitarian and immediate development responses an informal drought assessment was carried out in the Central Highlands concurrently with a technical advisory visit during June/ July, 2022. The assessment encompassed 14 villages on a West to East transect through the western fringe of the Hindu Kush from Dulaina district in Ghor Province to Yakawlang District in Bamiyan Province. This report summarizes the observations and findings regarding the current situation.

All communities have been severely affected by the current drought, especially those dependent upon rainfed wheat. In 2021, crop yields were approximately half those of 2020 (a 'normal') year. In 2022, many areas were unable to be planted due to lack of soil moisture and those areas planted are expected to yield little more than the seed sown. Irrigation sources are drying-up and some crops, particularly potatoes, are unlikely to yield.

Livestock are the main household asset and the sale of which to purchase food and other essentials is the main coping mechanism. In 2020, the average household had 20 head of small ruminants, but this number had halved by 2021 and has now reduced to three. This has not only eliminated the households' main coping mechanism but seriously jeopardized the ability to cope with future, increasingly frequent, droughts as numbers will not be back to the desired 20+ for six to eight years (based upon the time required to recover from the last three-year drought in 1998 – 2001).

Most communities or households did not have any coping mechanisms in mind to address this new situation and said that they were reliant upon emergency support which would be required until at least next year's August to October harvests. A few men and some whole families migrated to nearby towns, but failed to find employment and needed to return. The team felt that few men would be able to migrate to Iran since they were mainly sharecroppers on annual agreements and must be present for signing of contracts and showing that there is sufficient labour to ensure good yields (of which the landlord will take 50% - 75%).

Summary of findings

- The effects of the drought are everywhere and clearly visible. Severe food insecurity faces most communities. *Support will be required by many villages through September 2023.*
- Low wheat yields and complete crop failure are facing most communities visited. *Harvests will only provide a few months' supply.*
- Livestock numbers have been reduced to a level where their sale no longer provides an adequate coping mechanism and indeed many households may be forced to sell all their remaining animals. *Restocking for these households will be very difficult and take many years.*
- Current meteorological predictions are that the La Niña event will extend into early 2023. Except for those villages that continue to have sufficient irrigation water, there will be no substantial sowing of irrigated wheat crops this Fall. *Provision of wheat seed or inputs for Fall sowing is not to be recommended.*
- The 2023 harvests are dependent upon the winter snowfall and rate/ timing of the snowmelt. *Both are unpredictable and any emergency response must be sufficiently flexible to take this into account.*
- It is unlikely that this season's wheat harvests will be of a quality suitable for seed. Grain will be small, shrivelled and non-viable. Quality seed next spring will be difficult to source and expensive. Similarly, potato plantings in Spring 2022 were greatly reduced and crops are poor. Seed availability and quality for Spring 2023 will also be poor.
- *The lack of quality seed presents an **opportunity** to demonstrate to farmers simple methods of improving seed quality and germination prior to sowing.*
- *Claims that cash for inputs affected prices and availability need to be investigated and understood.*

Introduction

Current situation

Afghanistan is in the second year of a major drought due to a La Niña weather event, which is projected to last through to early 2023, resulting in reduced precipitation during the winter of 2022-23 and thus reduced snow melt in Spring/early Summer 2023. The Central Highlands have been particularly severely affected due to a reliance on rainfed agriculture. Many communities have reported that they were unable to plant and/or harvest a significant crop these past two years and as a consequence had to sell livestock and other household assets to purchase food and other necessities.

The principal production enterprises in the highland areas are:

Wheat: Wheat is the primary subsistence crop and accounts for approximately 70% of an individual's calorific intake. Few households produce sufficient wheat for their annual needs and rely on purchases for part of the year.

Irrigated winter wheat: The most productive wheat crop is that sown in the Fall (October to December) and grown under irrigated conditions. With a longer growing season and an assured water supply reasonable yields are assured. Crops are restricted to the irrigated valley floors where land is limited and not available to all households, especially in Ghor Province.

Irrigated Spring-sown wheat: In some areas access to irrigation water is restricted to Spring and early summer thus precluding Autumn sowing due to a lack of moisture at that time for cultivation and seed germination. These crops are also usually assured of some yield.

Rainfed, Spring-sown wheat: This is the most common crop throughout the highlands and very susceptible to vagaries in weather. Investment in the crop is low due to the risks involved and yields very low. Crop failure is common.

Potato: Potato is the principal cash crop and grown on the irrigated valley floors. It is very sensitive to a lack of irrigation water and usually only grown where irrigation is guaranteed for the duration of the season.

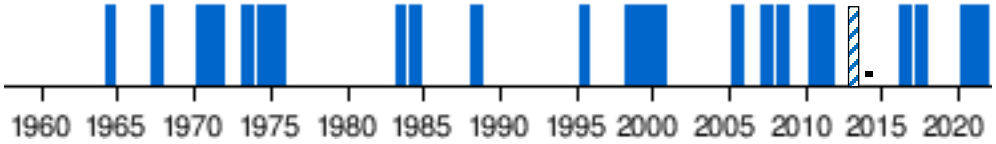
Livestock: Livestock has traditionally been a household's main income source and asset. Small ruminants, sheep and goats, predominate. Productivity, lambs or kids raised to sale, is highly dependent upon forage and fodder growth on the rangelands which in turn is determined by weather conditions, particularly rainfall.

The purpose of this rapid assessment was to understand better the current situation and household perceptions of the possible effects of a further year of drought with a view to possible emergency needs.

A brief history of recent drought events

Extreme weather events, particularly droughts and floods, have long been a threat to livelihoods in the Central Highlands. Droughts are typically associated with La Niña ENSO (El Niño Southern Oscillation) events, the frequency of which have increased markedly over the past 60 years. During the 60-year period 1901 – 1960, there were 10 La Niña events, followed by eight over the next 30 years and a further nine during the past 30 years: a doubling of the frequency of occurrence (Figure 1).

Figure 1: La Nina episodes 1960 - 2022[i]



In addition to La Niña-associated meteorological droughts, the distribution of rainfall is becoming more erratic. This is usually attributed to climate change. A typical scenario is rain ceasing earlier in the Spring thus shortening the season of available soil moisture (crop growth) and potential yield. Higher Spring temperatures also result in more rapid, early snowmelt, thus reducing the amount of water available for both irrigated and rainfed crops later in the season with consequent crop loss.

A common coping strategy during times of drought and food insecurity was to purchase food and other essentials on credit with livestock, particularly small ruminants, as surety. If the debt could not be repaid at the next crop harvest, then livestock were sold to repay the debt. Provided sufficient livestock feed was available, this allowed the farmer to harvest the lamb/ kid before repaying the debt. Households would then rebuild their flock and the process repeated when the next drought occurred. With the increasing frequency of droughts many households are not able to rebuild their flocks before the next droughts and so flock sizes and thus household assets are dwindling.

Assessment

Methodology

The assessment was conducted concurrently with an evaluation of training methods and outcomes. Villages had been reselected for the training evaluation and lay on a West to East transect (Chaghcharan, Ghor Province, to Yakawlang, Bamiyan Province, in the Western end of the Hindu Kush. A total of 14 villages were visited (Table 1).

[i] Adapted from La Nina, https://en.wikipedia.org/wiki/La_Ni%C3%B1a

In each village a Focus Group Discussion (FDG) was held with a mixed group of men and women, usually between five and ten. Following a discussion of the training topics and methodology, a short discussion was held regarding the current drought. Discussion topics included:

- A general overview of how the community and environment had been affected by this drought
- Crop practices and yields over the past three years (2020 – 2022)
- Livestock numbers, notably small ruminants (2020 – 2022)
- Coping strategies adopted over the past two years
- Future plans

Table 1: Number of villages visited by province and district

Province	District	Village	Total
Ghor	Chaghcharan	Khamin Safid	3
		Sar Palu Sang	
		Zard Sang	
	Dulaina[ii]	Vazh Gona	6
		Gala Asyab Qala	
		Gala Asyab Joypoda	
		Gala Asyab	
		Eski Chak	
		Galabid	
	Dowlatyar	Kahmardi	2
		Koshk-Sofila	
	Lal wa Sarjangal	Shuhristan-Qylani	1
Bamiyan	Yakawlang	Zard Sang	2
		Munar	

General overview

The countryside was parched with no active plant growth away from near irrigation channels and irrigated plots. Even normally drought tolerant native species, such as Atriplex spp (saltbush) showed little active growth. *The quality of winter fodder taken from the rangelands (the major source of fodder for most households) will be low.*

Rainfed wheat, the crop most relied upon by most households along the transect, was in very poor condition with few "reasonable" crops observed. Land preparation had been poor with a cloddy seedbed and little fine tilth to aid germination. Crop emergence was very low. Tillering (branching) was also greatly reduced thus restricting flowering and the number of ears/ plants. *Drought notwithstanding, improved seeded preparation and sowing practices would enable quicker, more vigorous emergence thus ensuring better utilization of any available soil moisture.*

Irrigated wheat plots were few but generally in average condition. Some plots were beginning to show signs of moisture stress and, with almost six weeks to harvest, yields may be expected

[ii] Extra visits were made to Delaina District as it was considered by CRS staff to have been p

to be considerably below average. Plots which were not stressed should produce average yields. *Overall, irrigated wheat yields will be slightly below normal.*

Almost all potato crops were severely stressed and clearly there was insufficient water or time to irrigate properly during the period in which water was allocated. *Yields will be substantially reduced.*

Livestock were 'conspicuous by their absence'. Most animals observed were in good condition, which might be expected at this time of the year since they have just come off grazing the Spring flush and their reduced numbers providing more forage/ head. *With most land now parched, feed availability leading up to the critical mating period will be critical. Conception and lamb production next Spring will be severely compromised from an already low base.*

Focus Group Discussions

Most communities visited had received emergency assistance from CRS during the past twelve months and were clearly hoping to receive further assistance this coming winter. *Some care needs to be taken when considering responses and correlated with visual observations.*

Productivity 2021: All groups recalled very poor harvests in 2021 with a few mentioning complete crop failure. Overall production estimates for the main household enterprises are given in Table 2. The data clearly shows the reliance of communities on Spring-sown crops, particularly in Ghor (the two villages reporting growing winter wheat being in Yakawlang District, Bamiyan).

For all wheat crops there was a major reduction in yield following the first La Nina winter of 2020-2021 with cereal yields being only one-third of those expected (Table 3). Almost half of the villages growing Spring-sown wheat and one-third growing rainfed wheat experienced complete crop failure. *For the 2022 wheat harvest, half the respondents expect not to harvest anything and the remainder little more than the quantity sown.*

Potato yields at the 2021 harvest were only half the expected yield despite usually being allocated the more reliable irrigated land. The number of villages planting potato this current year is only two-thirds of those that normally plant. *Two thirds of the villages that have planted potato are not expecting to harvest and those that will harvest expect only 25% of a normal yield. Probably insufficient to cover production costs.*

Spring-sown crops, whether irrigated or rainfed, are dependent upon sufficient winter rainfall and snowmelt to take the crop through to harvest. *With a predicted further six months of La Nina conditions at least, it is unlikely that the spring 2023 wheat crops will yield significantly and doubtful that many farmers will even attempt to sow. The potato crop is likely to be considered an even greater risk with only a few better off households or with assured irrigation planting*

*Table 2: Summary crop productivity 2020 – 2022**

Year	Enterprise											
	Irrigated Winter Wheat			Irrigated Spring Wheat			Rainfed Spring Wheat			Potato		
	# villages planting	Reproduction ratio	# villages not harvest	# villages planting	Reproduction ratio	# villages not harvest	# villages planting	Reproduction ratio	# villages not harvest	# villages planting	Reproduction ratio	# villages not harvest
2020	2	**20**	-	7	**9**	-	12	**7**	-	9	12	-
2021	1	**5**	1	7	**3**	3	9	**2**	2	8	6	2
2022 (est)	1	**3**	-	6	**1**	3	11	**1**	5	6	3	4

* Note: Figures shown in this table relate to crop yield relative to seed sown (the multiplication ratio). Comparisons can thus only be made between years within a crop type. Figures **do not represent total yield** and comparisons cannot be made between the different wheat enterprises, since different seed rates are used for the different wheat types. Seed rate data was not asked, but as a 'rule of thumb' the seed rate used for Winter-sown irrigated wheat is approx. twice that of rainfed Spring wheat, with irrigated Spring wheat somewhere in between.

Table 3: Summary: yields as % normal year (2020).

Year	Enterprise			
	Irrigated WW	Irrigated SW	Rainfed SW	Potato
2020	100%	100%	100%	100%
2021	25%	33%	29%	50%
2022 (est)	15%	11%	14%	25%

Table 4: Summary: livestock numbers (small ruminants/ household.

Year	# sheep & Goats/ HH
2020	18
2021	9
2022	3
2010	*25*

Household water supplies: the effect of the drought on household water supplies was only mentioned in one village, Khamin Safid, where domestic water supplies are now limited to a pathetic trickle and would soon cease. *The group said that they have no alternative to abandon the village and hope that they could return in time for sowing next year.*

Figure 1: sole water source for domestic use, Khamin Safid Village

2021 Emergency intervention: It was mentioned in relation to both seed and fodder that providing cash for inputs during a time of extreme shortage put a strain on the local supply with households in the same or neighbouring communities selling their own seed to benefit from the high prices being offered and purchasing grain from the bazaar as their own seed. *These claims need to be verified and the implications understood.*

Coping strategies 2021/ 22: The three most commonly mentioned coping strategies were (a) a reduction in plate size - interestingly no group mentioned skipping meals; (b) borrowing cash or purchasing goods on credit from a local store; and (c) selling livestock. *Although most villages had received emergency assistance in late 2021, the significant reduction in livestock numbers (Table 4) reflects the severity of the event and clearly shows that households could not withstand a similar event this year by relying on traditional strategies.*

A few groups mentioned that some individuals had migrated looking for employment in nearby larger cities or Iran, however their numbers were not significant. *In one village, Sar Palu Sang, five men migrated to nearby Chaghcharan and other provincial centres but were unable to find employment and returned.*

It was pointed out by the CRS team that many households were tenants or sharecroppers and had annual agreements with their landlords. For them, migration was not an option since they needed to be present to sign their agreements and the landlords wished to be assured that there were sufficient family members available to tend the crops and ensure maximum yield (of which half/ three-quarters would be given to the landlord).

Crop forecast 2022: All groups were expecting very low yields or complete crop failure. The appearance of most crops in the field confirms this, particularly in Ghor province. In the small area of Bamiyan Province that was visited, crop health was much more variable. In the main valley irrigation water is derived from rivers and aquafers fed by the lakes at Band e Amir. These crops, dominated by winter wheat and potato were in good condition and can be expected to yield normally. However, the two villages near visited near Yakawlang were away from these main aquafers and crop condition was similar to those in Ghor Province. *Careful targeting will be needed for any emergency assistance.*

Coping mechanisms 2022/ 2023: Most villages are likely to harvest sufficient wheat for two to three months maximum. With the exception of one isolated village, Khamin Safid, in Chaghcharan District, no group had firm ideas as to how they may cope during the next 12 months.

Livestock as a coping mechanism no longer remain an option. Their numbers have been reduced to below replacement levels and livestock as a viable enterprise is in doubt for many households.

The situation regarding migration is not clear. Communities are clearly aware that local employment opportunities are minimal. Although employment in Iran was mentioned it remains doubtful whether remittances alone could support a family.

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