CHAPTER 1: INTRODUCTION

1.1 Research Background

Climate disasters such as drought is considered a major risk to developing countries (World Bank Group, 2020). Drought is a recurrent and normal climatic feature that affects majority of the countries to some extent (Wilhite, 1996). Wilhite D.A. (2000) described drought as hazard that has a slow onset, which means it progresses over months to years and affects a large area of land. It occurs when various hydro-meteorological processes limit the precipitation and availability of groundwater/surface water and is characterized based on its severity, duration, timing, and location. However, the onset and end of the drought and its severity is often difficult to determine and its far more difficult to quantify the impacts and provision of disaster relief (Wilhite, 1996). Despite the considerable advances made in drought prediction technologies (National Drought Mitigation Center), there still exist challenges when it comes to the prediction of drought for the long lead time and under changing environment (Hao, Singh and Xia, 2018). This is because of the chaotic nature of the atmosphere (Yuan *et al.*, 2011), climate change, and human activities. For example, human activities such as irrigation may result in hydrological drought. Hence, human activities are required to be modelled for an accurate prediction, which is often expensive and difficult to do so since the current drought prediction is more focused on natural aspect rather than human aspect (Hao, 2018). Regardless, the early warning systems and monitoring tools have helped reduce, if not eliminate, the damaging impacts of drought.

These monitoring tools indicates that Afghanistan experiences increase in temperature and reduction in precipitation which results into moisture loss in soil, faster melting of snowpack, water scarcity, and very hot days (Government of Afghanistan, 2015). These factors contributes to the Severity of drought in Afghanistan which has greatly impacted the livelihood of various communities as a consequence of many factors such as poverty, wars, pandemic, groundwater

exploitation, population growth, climate change and lack of proper water management, especially in rural areas (Pervez, Budde and Rowland, 2014).

In the past four decades the significant drought season experienced by Afghanistan was in the late 1990s and early 2000s, furthermore, According to a report by the Ministry of Agriculture Irrigation and Livestock, in 2018, Afghanistan went through a life-threatening drought with 22 out of 34 provinces which is more than two-third of the Afghan population, affected by drought which is ranked as the most extreme of the last four decades (FAO, 2020). However, according to Andrew Hoell, the current drought is unprecedented. Afghanistan have experienced two consecutive seasons of below-average precipitation over the last two years and a third such season with a 70% chance of below-average precipitation is expected between October of 2022 – May 2023 (wet seasons) across the country. Famine Early Warning Systems Network (FEWS NET) is warning of another extreme multi-season drought in Afghanistan because of La Niña events, which is due to climate change and rising temperature all of which, based on Andrew Hoell, the principal investigator in FEWS NET, results in the below average precipitation in Afghanistan (FEWS NET, 2020). Furthermore, it is predicted that by 2030 drought in Afghanistan will be the norm rather than a cyclical event (FAO, 2020).

The latest observation of precipitation in Afghanistan is based on the CHIRPS (Climate Hazards Group InfraRed Precipitation with Station Data) datasets which shows the below an average cumulative precipitation for 2021/2022 across the country Figure 7, especially in northern, north-eastern and central areas of the country. This consecutive below-average rainy season have left no room for groundwater recovery and has led to poor vegetation, all of which severely impacted the livestock and agricultural livelihood (FEWS NET, 2022).

In Afghanistan people largely depends on agriculture for their source of food and income. About 70% of the Afghans lives and works in rural areas, mostly on farms, and 61% of all households earn their income from agriculture (The World Bank, 2018). However, due to lack of infrastructure only 10% of agriculture rely on formal irrigation structures and the remaining 90% of agriculture rely on

informal or no structures (NATO CFC, 2012). As such food security and agriculture is highly vulnerable to drought and according to a report by Mohammad Assem Mayar (2021), a water resource management expert, drought has caused wheat crops that were dependent on wheat to fail, resulting in the drop-in livestock prices, and drinking water shortage. This drought impact on agriculture is evident by an estimate that were made for Afghanistan's wheat demand and production in 2020 and 2021; in 2020 wheat demand was 6.4 million tonnes, of which 5 million tonnes were domestically produced and 1.4 million tonnes were imported. In contrast, because of drought in 2021, national wheat production experienced 25% deficiency and the country needed to import wheat of 2.65 million tonnes (Mohammad Assem Mayar, 2021). Agricultural and livestock sources is further threatened as the drought events are expected to result in low-average-harvest. This situation results in the instability of the communities and especially of farmers that are left with no investment in agriculture (World Bank Group, 2020).

The cyclic occurrence of droughts has greatly impacted the country at three different levels; the households and the community i.e. food security, water, sanitation, and livelihood security; the ecosystems i.e. land and water resources; and people's displacement, and conflict over water resources. Countries like Afghanistan, where the economic and social support systems have low endurance and people have few coping strategies, will have a great resource degradation (World Bank Group, 2020). Evident by the previous studies, drought may affect the different areas and people of the same affected area very differently (Olaleye, 2010). The response of each households and individuals differs based on their previous and current status of wealth, and access to aids and loans, this statement is proven by the following studies.

The effects of drought on agriculture have attracted a number of studies recently. Some of these studies are by Meraj Sarwary *et al.* (2021) and Aliyar *et al.* (2022), both studies explores farmers perception and adaptation strategies implemented by farmers in Kabul, Bamiyan, Kapisa, Parwan, Panjshir, Wardak, and Ghazni Provinces. The details of these studies are given in the literature review

section of this paper. In short, the findings from both of these researches indicates the need for localized strategies as it showed the differences in the vulnerability and adaptation strategies of farmers across different environment (Aliyar *et al.*, 2022). In short, the findings from these researches indicates the need for localized strategies as it showed the differences in the vulnerability and adaptation strategies of farmers across different environment. These studies indicate that drought perception, vulnerability and coping practices differs from place to place because of the interaction of the drought with diverse human factors.

Hence, there is a need for further literature on the vulnerability and coping capacity of farmers with regards to drought in different parts of Afghanistan, in order to inform tailored response. Therefore, this research conducted vulnerability and coping capacity analysis of the farmers of Arabmazari village, Balkh Province. Keeping in view the significance of agricultural economy in Afghanistan and its vulnerability to drought, the objective of the research is to i) determine the level of vulnerability of farmer's to drought, ii) explore the strategies and coping mechanisms followed by different farming – household before, after, and during drought and its effects on their families, iii) identify the challenges and limitations to practice a successful drought-risk management among the farmers iv) determine the impact of drought on different wealth groups, v) determine government's response and strategies for the farmers for Arabmazari village, Chamtal District of Balkh province. The information is gathered through group discussion and questionnaire in order to understand the coping capacity and vulnerability of the farmers. This research adds to the existing researches that were carried out in Afghanistan. It offers guidance for the researchers in Afghanistan and anywhere else to carry out more research on vulnerable communities impacted by natural disaster and study their coping capacity to realize the efficiency and inefficiency of the strategies. Lastly, the author has developed her own point of views and provide suggestions. Recommendations that is made at the end of this research paper will hopefully encourage readers and policy-makers to develop an effective

implementation methods and strategies that are practical for the farmer's cultural, societal, economic and political situation.

1.2 Study Area

The study is carried in Arabmazari village which is part of Chimtal or Chamtal district located at the western part of Balkh Province. Balkh Province is one of Afghanistan's thirty-four provinces, located at the northern regions and bordering with Turkmenistan. The population is estimated about 1,509,183 (National Statistic and Information Authority (NSIA), 2021-22) which are ethnically diverse and with the majority in rural districts busy farming. There are total of 15 districts with Mazar-i-Sharif serving as the capital city of Balkh province and hence there are major ethnic groups such as Tajiks and Pashtoons followed by other ethnicities like Uzbek, Hazarars, Turkmen, Arabs and Baluch.

Balkh Province is one of the most drought affected provinces and where people relies on agriculture. It is also one of the provinces which is affected by climate change, decrease in precipitation and snowfall Figure 1. Arabmazari village of Chimtal district, of Balkh province was selected for the study, because the village was suggested by officials from the ministry of agriculture and of energy and water that were interviewed during our sample collection. The village is known for suffering extremely during the past 5 years and where people highly depends on agricultural activity.

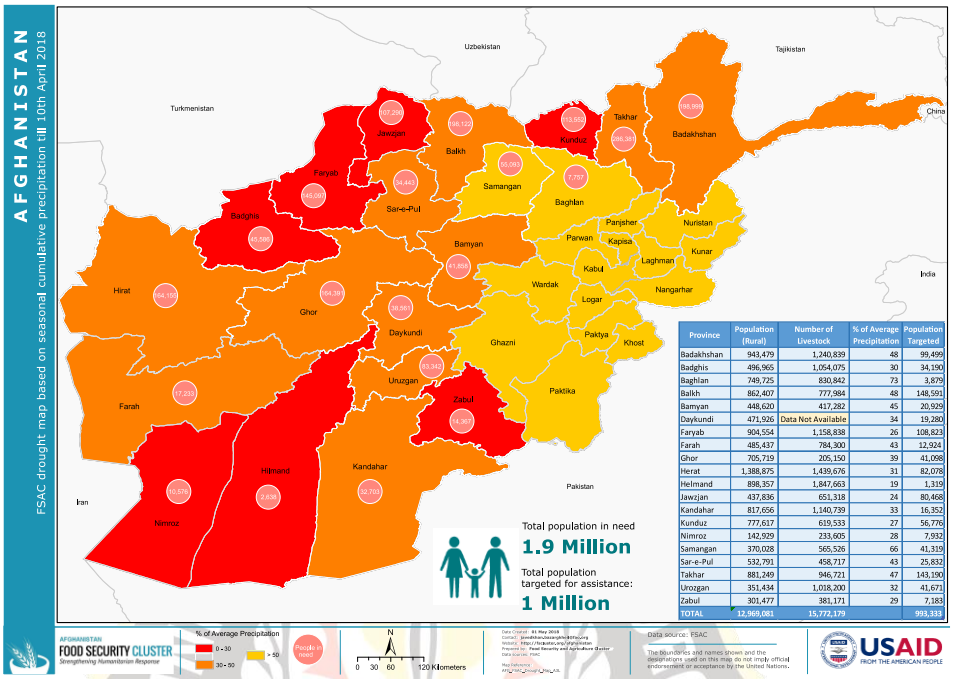

Figure 1. FSAC drought map based on seasonal cumulative precipitation till 2018 (FAO, 2018)

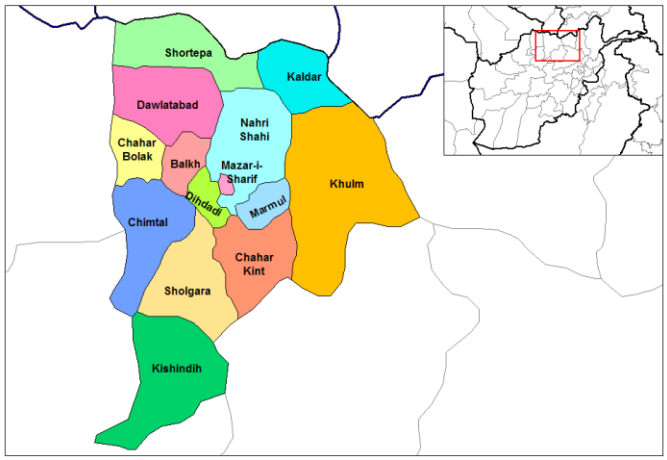

Figure 2. Districts of Balkh (image from: Wikimedia)

1.3 Problem Statement

The last 40 years of political and socioeconomic challenges in Afghanistan has made the mitigation and adaptation capacity towards natural disaster limited (National Environmental Protection Agency 2015). Adaption is an important step for farmers but it requires knowledge about the variations of climate and its impact,

so that the farmers could respond appropriately. This no- adaptive capacity and high climatic exposure have made Afghanistan, especially farmers, most vulnerable to climate change (Omerkhil *et al.*, 2020). To make matters worse, for many years the Afghan government did not have huge number of facilities and financial capacity to help mitigate the impacts of drought or other natural disasters (Miyan, 2015) Hence why, farmers are forced to depend on their own, often ancient, methods to cope with drought and many other disasters.

As stated very well in a south African report, while commercial farmers may decrease their assets during the events of disasters like drought, subsistence and smallholder farmers do not have the choice of reducing their assets as they lack resources including lack of knowledge on the management of farm (NAMC, 2016). Farmers in Afghanistan, uses variety of adaptive methods to better cope with the impacts of drought. Some of these techniques are agricultural practices i.e. re-cultivation, irrigation (Jawid and Khadjavi., 2019), and shifting crop patterns which works well against drought (Qureshi and Akhtar, 2004); and non-agricultural practices i.e. doing off-farm jobs, selling of the lands, livestock, and other goods (Miyan, 2015).

However, As the saying goes "Modern problems require modern solutions", although these words were used by Dave Chappele, a famous American comedian, and is often used as the punchline to an opening problem with extreme solution. It's meant to be humorous but it's also very apt to the situation farmers are facing. With changing climate, increase in the frequency of drought and other natural disasters, decades of conflict, and rising population it may become harder for the farmers to rely on their traditional method against natural disasters (Government of Afghanistan, 2017) Like in most developing countries, agriculture plays an important role when it comes to the stability of the rural communities as households largely depends on agriculture for food and income (Pain and Shah., 2009). When their livelihood is compromised, it leads to other drought impacts as stated in literature review, such as food insecurity, loss of livestock and land, decline in health, and increase in crimes.

With the uncertainties within the government and constant changes in the policies it is not a surprise that often, without taking into account the literacy level and financial background, more responsibilities are placed on the farmers themselves to plan and survive drought with minimum governmental interventions. The common intervention these farmers receives from the government is through drought relief, which in the long-run, is not sustainable.

In this case, what then is the drought coping capacity and vulnerability of these farmers? To answer this research question, an assessment of the vulnerability level and coping capacities of the farmers is required. Balkh province, Arabmazari village is selected because the location is one of the most affected regions by drought and where (unlike Kabul, Bamiyan, and other major provinces and districts) it lacks a proper research and survey. This study focuses exactly on that, it will assess the vulnerability of the farmers and how efficient or inefficient the coping strategies, practiced by the farmers, are.

1.4 Objectives and Research Questions

1.4.1 Main Objective

The main objective of the research is to study the drought vulnerability and coping capacity exhibited by the farmers.

1.4.2 Sub-Objective

The followings are sub-objective of the study:

1. To determine farmer's vulnerability level to drought
    a) How has drought impacted farming practices in terms of productivity and cost efficiency?
    b) How are livelihoods of farmers impacted as a result?
2. To explore coping mechanisms followed by different farming – household during drought and its effects on their families
    a) What measures in farming has been put to practice to deal with lack of or reduced access to water?

b) What are the challenges faced in daily life such as cooking, washing and feeding and drinking?

3. To identify the challenges and limitations to practice a successful drought-risk management among the farmers
    a) What is the efficiency level of the mitigation measures listed?
    b) Which of the listed measures are unsustainable?
    c) What are the negative copings practiced?
4. To determine the impact of drought on different wealth groups and how they are dealing with drought
5. To determine government's response and strategies for the farmers of Balkh province
    a) What are government programs to mitigate the impact of drought?
    b) How are farmers impacted/protected by these programs?

1.5 The Hypothesis

The following is the research hypothesis

1- The farmer's coping mechanism and strategies towards drought disaster is ineffective
2- In periods of drought, Subsistence or small scale farmers requires governmental and non-governmental assistance to cope with drought
3- The government has failed to provide an effective drought-risk management policy to help farmers in need.

1.6 Limitations of the study

The main limitation this research came across is the study sample size that may not represent the whole of the population, hence limiting the generalizability of the study. There is no online factual information about the population of the village chosen for this research, the only information about the population is just an estimation given by the community leaders. In-fact this research may be the first research performed on Arabmazari village since there are no relevant online data in regards to this village. This information may make the current research as much

important to provide insight about the struggles of farmers against drought, however, due to time restriction and high cost, the researcher is unable to carry out an extensive research.

Nevertheless, the research does not aim to generalize its finding to the general population but it is hoped that this study serves as a stepping stone for future researchers of Arabmazari's village. To ease with the process of collecting data, the researcher decides to use non-probability purposive sampling method where it does not necessarily require a large sample data as long as the present data answers all of the objective.