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Assessing the Impact of Drought on the Livelihoods of the Communal Farmers in Kunene Region, Namibia

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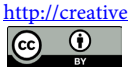


Abstract

Drought is a recurrent climatic phenomenon that poses significant challenges to agricultural communities worldwide, particularly communal farmers who heavily rely on rain-fed agriculture for their livelihoods. This study investigated the socioeconomic impact of drought on communal farmers in Kunene Region, aiming to understand the multifaceted consequences and suggest strategies employed by affected communities. Utilizing a qualitative research methods approach, in which a phenomenological research design was used. The study comprised of twenty-two (22) respondents who were sampled using a convenient sampling. Qualitative data was gathered through key informant interviews. The analysis focused on assessing the direct and indirect effects of drought on various aspects of farmers' livelihoods, including agricultural productivity, income generation, food security, and social well-being. This was done through thematic analysis. The study revealed that prolonged periods of drought have led to significant crop failures, resulting in reduced agricultural yields and income loss of communal farmers. Moreover, the depletion of water sources has exacerbated livestock mortality rates, further compromising households' economic resilience. The cascading effects of drought have also strained food security, leading to increased reliance on external assistance and coping mechanisms such as migration and distress sales of assets. However, amidst these challenges, the study recommends that the government works in conjunction with NGOs to offer training and basic education that will equip communal farmers with survival skills in times of severe droughts. Furthermore, the government should work in close liaison with international organizations like the World Health Organization (WHO) to ensure that appropriate food supplementation is available to the affected areas, as well as support for

child, maternal and mental health services which are quite prone during severe droughts. Further studies may focus on other regions and employ quantitative or mixed methods to enable generalizability of the findings. This research contributes to the existing literature by providing empirical insights into the impact of drought on the livelihoods of the communal farmers.

Keywords

Drought, Communal Farmers, Farming, Livelihoods

1. Introduction

Globally, drought has affected most regions across the continent, an estimated 55 million people around the world experience drought every year (World Health Organization, 2022). The most serious hazards are posed to livestock and crops which threaten people's livelihoods, thereby increasing the risk of diseases, death and migration. In Africa, rural livelihoods are largely derived from rain-fed agriculture with about 70 percentage of the continent's population depending on agriculture for their livelihood (Namibia Drought Assessment Report, 2022). Water scarcity impacts the world's population, and many are at risk because of drought. The temperature rises due to climate change are causing already dry regions to become dry and thus increasing the risk of drought or prolonging it.

Namibia is one of sub-Saharan Africa's most arid countries, and one of the aridest countries in the world (Liu & Zhou, 2021). According to the United Nations Development Program (UNDP), Namibia experienced severe drought events in the early 1990s and 2000s as well as a perennial drought from 2013 to 2016 (Luetkemeier & Liehr, 2019). In 1992/1993, Southern Africa suffered from a drought that affected the survival of a large part of the population. In Namibia, the severity of the food crisis was sufficiently serious to provoke a massive Drought Relief Program (Bann & Wood, 2012). The drought event that occurred in Namibia in 2012/2013 started mainly due to insufficient rainfall. About 300,000 people in the country were affected by the drought and more than 4000 livestock died (Masih, Maskey, Mussá, & Trambauer, 2014). In 2014/2015 and 2015/2016, Southern Africa experienced an El Niño-induced drought that affected more than 20 countries, including Namibia, with 38 million people exposed to drought across the region (Meque, 2015; Monyela, 2017). Namibia declared a national emergency in July 2016 due to drought. In 2019, the number of people affected by severe drought in sub-Saharan Africa increased to 45 million. Windhoek recorded the lowest rainfall in 2019 since 1891 and Namibia recorded its lowest rainfall in 90 years. More than 500,000 people in Namibia have been affected by the drought, more than 60,000 livestock succumbed to drought, with locals facing a severe strain on food and water supplies (Shikangalah, 2020). The country is frequently impacted by climatic extremes, and droughts threaten millions of people, plants

and livestock, leading to water scarcity and food insecurity. The Kunene Region continues to be a drought-prone area in Namibia, little and unpredictable rainfall remains common in the area leaving the communities with drastic drought conditions (Petersen-Perlman et al., 2022).

Since 2015, the country of Namibia has been facing severe droughts, which resulted in the head of state declaring the natural disaster a national state of emergency. Between October 2018 and August 2020, 90,000 cattle died because of the drought, 50% of them from one region, Kunene. To salvage the damage, the government spent about N$131 million on drought relief in 2019 (Petersen-Perlman et al., 2022). During that same period, Petersen further observes, Namibia experienced its driest rainfall season in 38 years, resulting in a severe drought. The drought resulted in diminished crop production, estimated at 42% below average in many areas, and left 257,383 people without adequate food, according to various United Nations agency reports. To remedy Kunene's drought woes, the government made N$21 million available to the region for the provision of water. Sixteen boreholes have been drilled, 19 water points have been set up, and 18 boreholes have been rehabilitated. In May 2022, the Cabinet of Namibia introduced food assistance for affected Kunene residents as well as water services and a livestock programme. The Kunene region received (69,988 × 10 kg) bags of maize meal, 269,212 cans of tinned fish, 39 wildlife carcasses, cooking oil, instant porridge, and bales of hay (Petersen, 2022).

It has been difficult for scientists, natural resource managers, and policymakers to develop plans and take action for drought preparedness, active risk management, monitoring, impact assessment, coping ability, emergency, and long-term response and mitigation because many droughts take an extended period to build up and are often forgotten once over (Petersen, 2022). This study, therefore, sought to explore the impact of drought on the livelihoods of communal farmers in the Kunene region, in Namibia.

2. Statement of the Problem

Namibia is the most arid sub-Saharan country, experiencing very high evapotranspiration rates (Mendelsohn et al., 2002). Consequently, Namibia is exposed to recurrent droughts, with historically devastating consequences. A growing population, persistent poverty and climate change threaten even greater impacts in the future. During severe drought events, rural communities suffer from both stock and crop losses leaving human beings in extreme poverty. Namibia's population is dependent on agriculture, fisheries, and tourism. During 2019, Namibia experienced drought in most regions more specifically in the Kunene region. Extremely poor rainfall was experienced that led to delays in cultivation activities and as a result cultivation and crops were extremely poor. Rainfall trends in the area have been very unpredictable exposing the area to persistent droughts leading to famine and extreme suffering of communal farmers. Additionally, animals' grazing conditions deteriorated due to a lack of water (Mendelsohn et al., 2002).

Frequent droughts in most parts of the Kunene Region normally leave a trail of very devastating calamities to humans as well as flora and fauna. Drought affects people's lives negatively. Various studies conducted in other areas within the same geographical zone have shown that drought and famine can be controlled by creating awareness and coming up with counteractive measures of helping the population from famine which is the later disaster.

Despite research efforts to address the impact of drought on the livelihoods of rural communities in the Kunene region, drought continues to affect most of the communal farmers. This study aims to assess the impact of drought on the livelihoods of the communal farmers in Kunene region and to suggest ways of building capacity with the communities focusing on drought risks rather than providing food aid and promotion of a dependency syndrome which exposes them to further risk if the aid organizations develop fatigue or move out of the area.

3. Research Objectives

The study was to achieve the following objectives.

- To analyze the livelihood activities of the communal farmers in the Kunene Region.
- To assess the impact of drought on the livelihoods of the communal farmers in the Kunene Region.
- To explore ways of building the capacity of communal farmers in the Kunene Region focusing on drought risks.
- To assess the mitigation measures, preparedness and coping capacities of the communal farmers in the Kunene Region.
- To examine challenges faced by communal farmers during times of severe droughts in the Kunene Region.

4. Theoretical Framework and Literature Review

The study adopted the Expected Utility theoretical framework. The advantage of this framework is that it is felt by its proponents to be a normative theory of decision-making under conditions of uncertainty. The concept begins with some adages that are held to be true that any normal individual would abide to. It can be proven that if a person adheres to these maxims, a statistical measure, generally referred to as utility, can be allocated to each possible outcome, with the favourite plan of engagement being the one with maximum expected utility. The framework was introduced by John von Neumann and Oskar Morgenstern in 1947 (Neumann & Mogestern, 1953). It is a common notion in economics that operates as a pointer for decisions taken when the payout is indeterminate. This suggests the alternative that judicious people would consider intricate circumstances, based on their risk appetite and preferences (Mongin, 1998; Cerreia-Vioglio et al., 2012).

As for this study, this framework entails analysing the adaptive behaviours as farmers anticipate and adjust to different rainfall patterns which impact their live-

lihoods. Such utility maximizing theories, however, assume people have perfect knowledge of the probability of shocks as well as the costs and benefits of actions, and ignore the complexity of human adaptation decisions: emotional, psychological, and social factors, along with objective arguments, affect individuals' evaluation of drought, leading to imperfect judgment (Waldman et al., 2020; Findlater et al., 2019). Observed adaptive behaviour in the face of disaster risk is found to be rational and heterogeneous in time and space; smallholder farmers tend to look for satisfaction rather than utility maximisation when making relevant decisions about their farm water management in the face of droughts (Tongruksawattana & Wainaina, 2019; Barreteau et al., 2016; Robert et al., 2016; Ardalan et al., 2015). Table 2.1 summarizes the behavioural factors used in existing socio-cognitive theories that aim to describe the decision-making process of humans based on psychological and economic sciences. Other adaptive behaviour theories link economics to psychological and sociological sciences. Examples of more complex theories about adaptive behaviour are the agricultural adaptation and perception model (Below, Schmid, & Sieber, 2015), the trade-off analysis model for multi-dimensional impact assessment (Claessens et al., 2012) the Consumat approach (Jager & Janssen, 2012), the technology acceptance model (Szajna, 1996), Rogers' innovation diffusion model (Miller, 2018), the prospect theory (Kahneman & Tversky, 1979), the protection motivation theory (Maddux & Rogers, 1983), the socio-cognitive model of private proactive adaptation to climate change (Grothmann & Patt, 2005), the value-belief-norm theory of environmentalism (Stern et al., 1999), and the theory of planned behaviour (Sutton & Austin, 2015; Madden et al., 1992).

4.1. The Concept of Drought

Drought is a prolonged dry period in the natural climate cycle that can occur anywhere in the world. It is a slow-onset disaster characterized by the lack of precipitation, resulting in a water shortage. Drought can have a serious impact on health, agriculture, economies, energy and the environment.

An estimated 55 million people globally are affected by droughts every year, which are also the most serious hazard to livestock and crops in nearly every part of the world. Drought threatens people's livelihoods, increases the risk of disease and death, and fuels mass migration. Water scarcity impacts 40% of the world's population and as many as 700 million people are at risk of being displaced because of drought by 2030 (World Health Organization, 2022).

Rising temperatures caused by climate change are making already dry regions drier and wet regions wetter. In dry regions, this means that when temperatures rise, water evaporates more quickly, thus increasing the risk of drought or prolonging periods of drought. Between 80% - 90% of all documented disasters from natural hazards during the past 10 years have resulted from floods, droughts, tropical cyclones, heat waves and severe storms.

Persisting for months or even years, drought affects large areas and has severe

impacts on all key socio-economic sectors, as well as ecosystems. Drought is a climate extreme, associated with climate variability and climate change. Drought and its impacts can be exacerbated by human activities that are not adapted to the local climate and/or soil type (EU Science Hub, n.d.). Climate change is expected to increase the frequency, duration and severity of droughts in many parts of the world. Such changing conditions may lead to an accelerated rate of land degradation and desertification which, in turn, may increase poverty and induce migration.

4.2. Livelihoods Activities for Communal Farmers

There are different livelihood activities that communal farmers can engage in such as irrigation canal and farmland restoration, upland farming tools and technical support, community rice banks, animal husbandry, organic gardens, Agroforestry, fish conservation, etc. Livestock farming in communal areas is an activity pursued by rural households as one of a range of livelihood strategies aimed at diversifying the risk. The cash and non-cash benefits derived from livestock, as well as the wide range of secondary resources harvested from communal rangelands, make an important contribution to livelihood diversification, and hence, resilience. Vetter (2013) is concerned that "Promoting full-time commercial farming as the main model for developing livestock farming in the rangeland commons limits the range of livelihood options among poorer and emerging farmers and reduces their ability to cope with market instability, droughts, diseases, climate change and other risks".

4.3. Livelihoods Challenges for Communal Farmers

The occurrence of droughts brings lots of headaches for farmers and the community at large. Unemployment rates increase as farmers scale down their labour force due to dropping figures on production. Unemployment is seen as one of the variables affected indirectly by drought, which is so evident in the agricultural sector. Though it is not analyzed in economic terms in Gil's research, it is rather measured in terms of the number of jobs lost (Gil et al., 2013).

Drought has also economic effects such as income losses, loss to industries directly dependent on agricultural production, decreased land prices, unemployment from drought-related declines in production, the strain on financial institutions (foreclosures, more credit risk, capital shortfalls), reduction of economic development, fewer agricultural producers (due to bankruptcies, new occupations), rural population loss (National Drought Monitoring Centre (Dellal & McCarl, 2010).

5. Research Methodology

The research methodology section outlines the approach used to assess the impact of drought on the livelihoods of communal farmers in Kunene Region, Namibia.

5.1. Research Philosophy

The use of the interpretivism or constructivist research paradigm was particularly appropriate for the study assessing the impact of drought on the livelihoods of communal farmers in the Kunene Region, Namibia, because it enabled a deep exploration of the farmers' subjective experiences and interpretations of drought within their unique socio-cultural and environmental context. This paradigm is grounded in the belief that reality is socially constructed and can vary across different groups and individuals (Yin, 2020). By employing this approach, the researchers were able to capture the subtle ways in which farmers perceive and respond to the challenges of drought, including their adaptive strategies and coping mechanisms, which are shaped by their specific cultural and social circumstances (Creswell & Poth, 2018). The interpretivist approach thus allowed the study to produce rich, context-specific insights that are crucial for understanding the lived realities of the farmers, making it an ideal choice for this research (Merriam & Tisdell, 2016).

5.2. Research Approach

The adoption of a qualitative research approach was particularly appropriate for the study assessing the impact of drought on the livelihoods of communal farmers in the Kunene Region, Namibia, because it allowed for an in-depth exploration of the complex and context-specific experiences of the farmers. Qualitative research is well-suited to understanding phenomena in their natural settings, enabling researchers to capture the meanings, perspectives, and emotions of participants (Creswell & Poth, 2018). In this study, the qualitative approach facilitated the collection of rich, detailed data through methods such as interviews, which were essential for uncovering the farmers' perceptions, coping strategies, and adaptive behaviors in response to drought (Merriam & Tisdell, 2016). This approach was ideal for exploring the nuanced social and cultural dimensions of how drought impacts livelihoods, providing insights that might not have been accessible through quantitative methods.

5.3. Research Design

This study adopted a phenomenological research design to explore and describe the impact of the drought phenomenon on the livelihoods of the communal farmers in the Kunene Region. Phenomenological methods are particularly effective at bringing to the fore the experiences and perceptions of individuals from their perspectives, and therefore at challenging structural or normative assumptions. Phenomenological research is a way to understand individual situations in detail. The theories are developed transparently, with the evidence available for a reader to access.

5.4. Target Population

The study was comprised of communal farmers from Outjo and Opuwo in

Kunene region. Mwinga et al. (2021) observe that in the Kunene region, 69 percent of the people are informally employed which is a cause for concern because it is much higher than the national level of 58 percent. Furthermore, the Kunene region ranks third in the country (64.1 percent) in terms of multi-dimensional poverty with the highest (worst) being Kavango East (79.6 percent), followed by Kavango West (70 percent). The two constituencies, which include Opuwo and Outjo were therefore targeted for the study. These regions are predominantly poor, and farming is the major source of livelihood for many people in this area with many people having resorted to farming, especially livestock and cropping.

5.5. Sample Size and Sampling Procedures

The study selected a group of 22 farmers with 10 from Outjo and 12 from Opuwo rural using convenience sampling. Golzar et al. (2022) define a non-probability sampling method where units are selected for inclusion in the sample because they are the easiest for the researcher to access. This study involved interviews to gather detailed comprehensive information regarding the impact of drought on the livelihoods of farmers in the Kunene region. The aim was to assess the impact of drought on the livelihoods of the communal farmers to suggest possible strategies to improve the livelihood of communal farmers in the Kunene region.

5.6. Research Instruments

The study used semi-structured interviews for communal farmers as well as unstructured interviews for key informants as instruments for data collection. Semi-structured interviews were deemed the most appropriate tool for data collection from the communal farmers. The flexible structure of the interview allowed the researcher to probe or encourage the interviewee if they are looking for more information or find what they are saying interesting. This method gave the researcher the freedom to probe the interviewee to elaborate or to follow a new line of inquiry introduced by what the interviewee is saying (Adams, 2015). Semi-structured interviews also allowed informants the freedom to express their views on their terms. This data collection tool allowed communal farmers to clearly articulate and properly self-express their emotions and experiences about the impact of drought on their livelihoods in the Kunene Region.

5.7. Data Collection Procedures

The data collection procedures for the study involved a series of steps to ensure effective and culturally sensitive engagement with the participants. After obtaining a letter of access from the International University of Management (IUM), the researcher submitted it to the Ministry of Lands and Agriculture for the necessary approval to conduct the study. With approval granted, the researcher began conducting interviews with the communal farmers, which served as the primary method for data collection. Recognizing that some farmers were not readily conversant in English, the researcher took the additional step of translating the inter-

view questions into the local vernacular. This approach ensured that all participants could fully understand and engage with the questions, allowing for more accurate and meaningful responses. The translation of questions facilitated effective communication and ensured the inclusivity of all respondents, thereby enriching the quality of the data collected.

5.8. Data Analysis

The study employed a thematic analysis, which allows researchers to systematically analyze and interpret qualitative data, uncovering meaningful patterns and insights that contribute to a comprehensive understanding of how drought affects communal farmers' livelihoods and informing efforts to support their resilience and well-being.

5.9. Ethical Considerations

The ethical considerations for the study were carefully addressed to ensure the protection and respect of the participants. Informed consent was a key priority; before any data collection began, participants were fully informed about the purpose of the study, the nature of their involvement, and their rights, including the right to withdraw at any time without any repercussions. Given the sensitive nature of the subject, particularly the challenges faced due to drought, confidentiality was strictly maintained to protect the identities and personal information of the respondents. The researcher also ensured cultural sensitivity by translating the interview questions into the local vernacular, facilitating clear communication and making the participants feel comfortable and respected. Additionally, the research received approval from the Ministry of Lands and Agriculture, ensuring that the study complied with national ethical standards and guidelines. Throughout the study, the researcher remained committed to minimizing any potential harm or discomfort to the participants, while also ensuring that the research findings would contribute positively to addressing the challenges faced by the communal farmers in the Kunene Region.

6. Findings

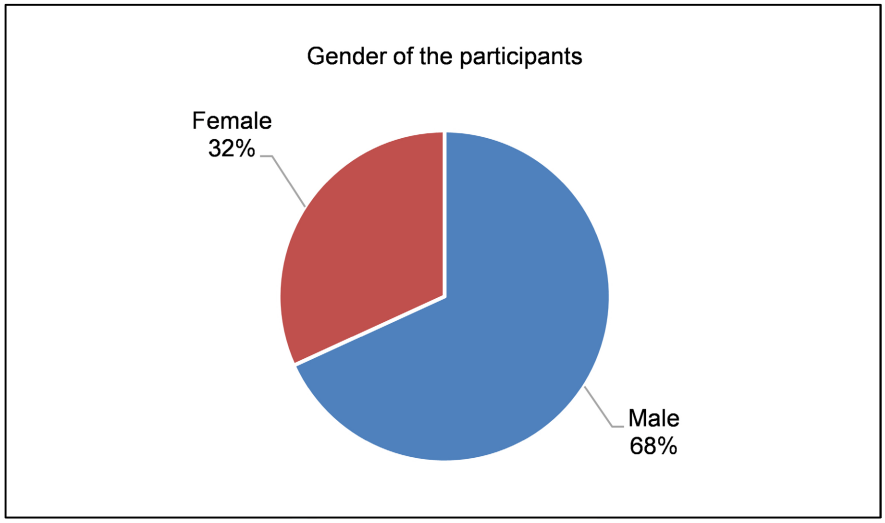
Thematic analysis is a method of identifying and interpreting patterns of meaning across qualitative data (Blaikie, 2010). The researcher's explanations and analysis are integrated with the literature, which serves as substantiation of the themes and sub-themes (Ajowi, 2012).

6.1. Demographics

Figure 1 presents a summary description of the respondents who took part in the in-depth interviews with respects to gender.

As shown in Figure 1, a total of 22 participants who are communal farmers were interviewed. Fifteen males representing 68% and seven females representing 32% participated in the in-depth interviews and these were communal farmers,

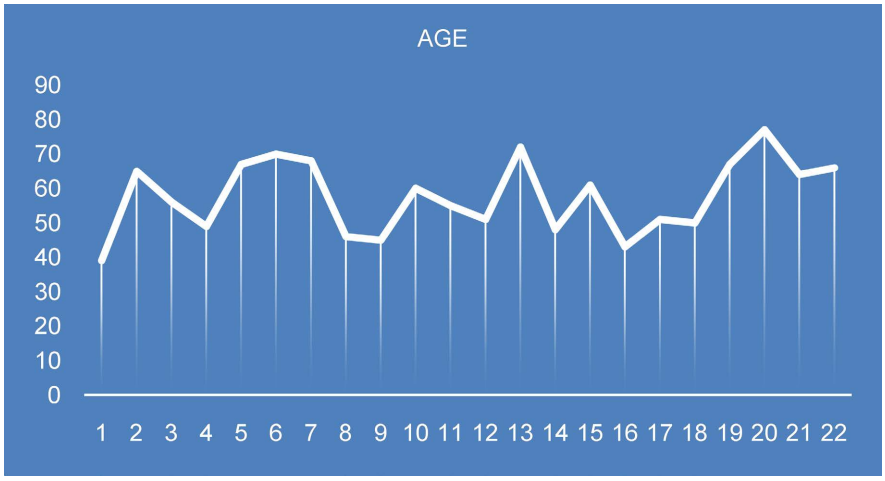
and this evidence indicates that the farming community is dominated by males. This is expected as most males are bread winners and head most families in different settings across the world.



Source: Researcher (2023).

Figure 1. Gender of participants.

As shown in **Figure 2**, the age of the communal farmers ranged from 39 to 77 years with an average age of 58 years. This shows that quite elderly people, presumably without any hope of getting employment at this age have resorted to farming and are most of the communal farmers. Furthermore, key informant interviews were conducted with three key informants, namely the Agricultural Regional Officer, the Finance Manager and a Director both from the NGO community. The idea was to collaborate information obtained through communal farmers as the main victims of drought in the Kunene region.



Source: Researcher (2023).

Figure 2. Age of participants.

6.2. The Livelihood Activities of the Communal Farmers in the Kunene Region

One of the pivot objectives of the study was to determine the livelihood activities of the communal farmers in the Kunene region. In this regard, the study discovered that most communal farmers engaged in subsistence farming and small-scale commercial farming as their main source of livelihood. This was followed by livestock rearing which is done jointly with crop farming. Farmers rear mostly cattle, goats, sheep, and donkeys as a fallback in times of need and as a means of draught power for farming purposes and other related tasks. Other farmers also did some garden farming especially in between seasons. This is testified to by two of the participants as follows: CF2: *In this area we depend a lot on farming for our consumption purposes. If I am lucky to produce more than what the family requires, I sell the extra to meet other family needs. When it's more difficult, I even sell some livestock … a goat for a small problem and a cow for big problems like children's fees.* In the same vein, participant CF4 had this to say: *Most of us do not have formal jobs here, we do our farming and if God favours us with rain, we run after our cattle as this is all that we have. We even do gardening for vegetables when we are not busy in the fields … all the way to fishing.* However, what was notable is that all these activities are prone to drought making farmers most vulnerable.

6.3. The Impact of Drought on the Livelihoods of the Communal Farmers in the Kunene Region

Data collected from the sample of 22 respondents in Kunene Region shows that communal farmers have been adversely affected by drought which has affected both main streams of livestock and cropping. They lost cattle and their crops to drought, forcing them to sell their cattle at give-away prices to avoid losing everything. Up to 18 out of 22 total respondents indicated that they were familiar with drought and hot weather conditions while 4 mentioned drought and floods. As a build-up to the main objective, the question was asked by respondents on how they would describe the weather patterns in the Kunene Region, say over the past ten years. One of the objectives of the study was to assess the impact of drought on the livelihoods of the communal farmers in the Kunene region are impacted by drought. When responding to this question, respondents indicated that drought had prevented them from effective farming and production to adequately sustain their livelihoods. Furthermore, they lost their livestock which only served to worsen their plight. This is what participants had to say: *CF3: This place has been very dry with limited rainfall, and this has been very often over the past decade.*

Another participant explained in affirmation as follows: "We *are affected by drought, as such; we are unable to produce enough food to sustain our livelihoods*".

The above verbatim quotes from the communal farmers indicate that the

Kunene Region receives very sporadic rainfall which makes it difficult for farmers to plan and do their farming within certainty rendering them vulnerable to hunger and suffering. These sentiments were corroborated by the key informants who concurred that the Kunene region experienced mild to severe drought weather patterns that resulted in communal farmers losing their crops and livestock.

To understand the type of farming activities that the communal farmers were involved in; the following question was asked: As a farmer, what types of farming activities have you been involved in? How long have you been engaged in these activities? The farming activities ranged from livestock, that is, cattle, goats, sheep, and donkeys as well as poultry and crops with farmers' experience in these farming activities ranging from one to forty years. One participant had this specifically to say: *CF4: Livestock-cattle and goats for the past twenty (20) years.* Gil et al. (2013) also presented similar findings, who observed that the occurrence of droughts brings a lot of headaches for farmers and the community at large. The unemployment rate increases as farmers scale down their labourers against falling production and yields. Furthermore, Fasemore (2017) also reiterated that additional impacts of the drought are death of livestock and poor crop yields due to poor or no rainfall making water unavailable for irrigation, and this results in increased food prices. This position was confirmed by other participants who indicated that they had been in cattle and poultry farming for between 10 and 40 years. This indicates that many communal farmers take farming as a source of livelihood in which they devote all their energy and time.

The impact of drought encountered by communal farmers in the study were categorised into the following seven key themes which are loss of livestock, loss of income, change of family lifestyle, selling livestock at below market prices, shortage of food, halting of farming activities, buying feed to salvage part of livestock. These findings agree with the views of Edossa et al. (2014) who concluded that drought is more than a natural hazard and physical phenomenon that can trigger serious socio-economic and environmental impacts, especially on the resource-poor and vulnerable communities. This position is affirmed by Shiferawa et al. (2014) who concur that drought directly affects agricultural productivity, human and animal health and can cause vegetation loss, as well as water scarcity resulting in food insecurity and poverty.

On being asked: How have these droughts affected your farming activities, income, and livelihood as a communal farmer? The participants had the following to say: *CF1: Yes, lost lots of cattle which then affected my income and family lifestyle.'* This position was affirmed by participant CF9: who also had this to say; *I Sold some livestock at below market prices to buy feed to salvage part of the livestock.'* This evidence epitomizes the level of impoverishment that communal farmers were subjected to because of incessant droughts in the Kunene region. They were stripped of their livestock which is a main source of livelihood for many communal farmers, hence affecting their lifestyles. This is in line with the conclusion by Mwinga et al. (2022) who concluded that because of drought in Opuwo

people moved from villages to town in search of greener pastures due to the loss of their livestock and the wilting of their crops. This is further corroborated by Amunyela (2021) who observed that drought and dry spells were experienced in the drought-prone areas of Namibia, affecting both crop and livestock production. In livestock production, farmers experienced high rates of livestock mortalities due to lack of grazing fields and drinking water for livestock.

Farmers were quite vulnerable to drought as they had everything to lose. They did not have any form of back up or safety nets. Only two farmers indicated that they were able to survive as follows: *CF19-No, from the training knowledge I managed to maintain my livestock somehow, sold a few and bought grass for feeding.* The farmer guided by the training they received, was able to sense danger and offload part of the livestock to salvage part of it. The second farmer relied on the borehole which simplified things: CF23-*Not really, having a borehole made things easy for me. All I needed was to buy grass bales to feed the animals.*

These results are corroborated by the following pieces of evidence from literature: Frischen et al. (2020) observed that the 2018-2019 droughts in Zimbabwe resulted in low crop yields and loss of livestock, resulting in farm fallowing by many subsistence farmers. In Mali, the 2015 drought resulted in the starvation of more than 300,000 people due to food insecurity (Giannini et al., 2017; Bhaga et al., 2020). In South Africa, the 2014-2016 droughts resulted in vegetation and wildlife loss in protected areas, although the impacts were not catastrophic (Swemmer et al., 2018). Recently, the 2017-2018 drought in the Western Cape Province of South Africa resulted in water restrictions which, in turn, resulted in knock-on effects on the economy, human health, and sanitation (Parks et al., 2019).

Asked on what backup they had during times of drought, most communal farmers professed vulnerability as they had no form of back or cushion of any sort. However, the following specific cases indicate some sporadic efforts by the government and NGOs to help the situation as testified to by the participants. Some received grants from the government, while some received some training and water tanks from NGOs, yet others received boreholes and some training from the government.

Farmers also had a high degree of exposure as most of them did not have alternative sources of income apart from their farming activities and this position was testified and affirmed by many participants. Few participants indicated that they had other sources of income such as being gainfully employed, transport business, cultural village tourism, and running a small shop to complement farming income.

Based on the above evidence, it can be concluded that some communal farmers have alternative sources of income or projects to insulate them against poor rainfall and droughts. While others had income from employment, which means they did farm relatively on a part-time basis and did not regard or treat farming as their mainstream income. One was into the public transport business while two were

running shops to complement their farming activities.

6.4. Ways of Building the Capacity of Communal Farmers in the Kunene Region Focusing on Drought Risks

Farmers were asked to share their strategies of dealing with droughts and various themes emerged from their discussions such as, looking for better grazing land, providing supplementary feeding for livestock, reducing the number of livestock by selling though at below market prices, storage of water in tanks. The discussions around these themes are detailed below:

One participant had this to say:

CF1: During extreme drought periods we resort to looking for better grazing pastures. This may mean migrating from one area to another for the sack of saving part of the livestock.' The same sentiment was shared by participant CF3 who had this to say: *"CF3: We normally look for ways to relocate and also communicate to others to relocate their livestock to better grazing areas until it is safe to return to our areas."* The following participants further affirmed this position: (CF5, 6, 7, 16, 17, 20, and 24). Another participant indicated that in such typical drought times, they provide supplementary feeding to their livestock. CF8: *When drought hits us hard, we normally buy and provide supplementary feeding to our livestock. However, due to shortage of funds, this normally involves selling part of livestock at giveaway prices to redeem part of it.* This sentiment was echoed by one of the key informants who indicated that farmers are forced to sell some of their livestock to buy feed and rent grazing land elsewhere. CF13: *Farmers normally try their best to save part of the livestock by selling part of the livestock to buy feed for the rest of the animals and even rent grazing land in other places.* One communal farmer also argued: CF19: *I make sure that I store enough water in tanks for drinking and then buy grass bales for feeding my livestock.* While yet another one had this to say: CF16: *I always make provision to move my animals to better grazing areas and sometimes do sell a few to maintain the rest. "*Equally another communal farmer had this to say: CF22: *Money is scarce to relocate animals to better grazing areas so mostly I try to buy grass bales and give water from the water tanks and this normal makes a difference".* These sentiments were also echoed by one key informant who affirmed that during times of drought and distress they lend a helping hand to vulnerable communal farmers. *Response to drought and other related disasters is our priority and every year we have a budget towards such bail out measures which is our core mandate as an NGO working in partnership with government. However, our help is a mere drop in the ocean.*

These findings bear testimony to the remedial actions taken by the government to help farmers and the general populace. This is in line with Petersen-Perlman et al. (2022) observation that to remedy Kunene's drought woes, the government made N$21 million available to the region for the provision of water. Sixteen boreholes were drilled, 19 water points were set up, and 18 boreholes rehabilitated. In May 2022, the Cabinet introduced food assistance for the affected Kunene resi-

dents as well as water services and a livestock programme. The Kunene region received 69,988 × 10 kg bags of maize meal, 269,212 cans of tinned fish, 39 wildlife carcasses, cooking oil, instant porridge, and bales of hay. This is also in line with Fasemore, (2017) observation that in South Africa during times of drought, companies such as Veolia Environment S.A. are highly active in the water sector in Africa, providing solutions for solving water and wastewater challenges. They provide competitive conventional and advanced water and wastewater technologies. A viable example is the Durban Water Recycling Project, a flagship public-private partnership (PPP) project for promoting water reuse. The agreement includes the major water users in eThekwini around the Bluff industrial area.

By extension, the participants were asked the following question: Are there any collective communal farming activities you participate in, in your community? The findings revealed that communal farmers confronted their situations individually without any specific guidance or training. Only a few indicated that there was some form of help they received during such pronounced drought periods. CF4: *"Yes, there is the Namibian Farmers Union (NFU). It is a national union of farmers in which once one becomes a member, an update is done weekly, and this can be received through different platforms. This is quite beneficial to farmers as support is rendered to them."* Other participants' responses also bore testimony to existence of community gardens which become a community safety net, there is also Farmers Day and this is done once yearly, and there is benefit in the form of awareness creation, there are cooperative community activities, where farmers are given bulls to assist them produce more livestock as well as community farming groups which consist of a group of small farmers to encourage and assist each other during drought.

The communal farmers were asked the following question: What do you think the government should do to assist communal farmers during periods of drought? While the answers varied, they had something in common. The following thematic areas surfaced: provision of irrigation schemes; provision of grants, provision of subsidies, assistance with feed and water, training, and awareness, provide educational programmes to farmers, provide restocking facilities, provide grazing land, drilling boreholes in strategic areas.

6.5. Challenges Faced by Communal Farmers during Droughts

Communal farmers were asked about the challenges they faced during droughts, and this is how they responded: The challenges ranged from shortage of water, which was exacerbated by lack of storage capacity, loss of livestock, lack of grazing for the livestock to veld fires, shortage of food and diseases. The problem of shortage of water was attested to by the following participants: (CF1, 5, 6, 7, 13, 14, 16, 17, and 20). The other problem that was identified by the communal farmers was that of the lack of grazing pastures for the livestock. One of the participants had this to say: *CF3 There is a lack of grazing land for livestock and if you do not have money to buy feed it becomes a disaster as you may lose everything.* The following

other participants also echoed this sentiment: CF4, 14, 20, 21 and 24. Veld fires were also identified as a common threat during times of drought as affirmed by the following participant: *CF11 There is the danger of veld fires caused by human error destroying the already bare grazing pastures*. Figure 3 shows the horrible sight of loss of cattle due to severe drought.

Figure 3 is part of the evidence that was collected by the researcher in the field, and it shows carcasses of livestock that succumbed to drought due to lack of grazing pastures and water. This evidence epitomizes the ravages of drought on livestock rearing which culminates into massive losses, especially goats, cattle, and donkeys.

Source: Captured by the Researcher (2022).

Figure 3. Livestock succumbing to drought in Kunene Region.

The following are the specific sentiments shared by participants CF21 to CF25:

CF21: Significant challenges are when I am unable to feed the livestock due to the water/grass shortages caused by the drought.

This position was further collaborated by another participant who had this to say:

CF23: Seeing animals dying of hunger, depletion of water, cost increases, sometimes no access to water or grass is quite a painful experience to me.

The last participant capped it all when he/she lamented as follows:

CF25: We have experienced a massive loss of livestock, animals dying from hunger and thirst, and this is quite worrisome.

These statements collectively demonstrate the extent of devastation and desperation experienced by communal farmers during times of drought. Thus, high dependence on rainfall leads to massive losses when there are severe droughts. These findings are in line with the observation by the United Nations Framework Convention on Climate Change (UNFCCC), (2021) that Agricultural droughts result in reduced harvests or crop failure, low grazing availability, emaciated livestock,

livestock losses and poor market prices. These impacts lead to food insecurity in the short-term and vulnerability eventually.

7. Conclusion

In conclusion, this qualitative research study as adopted, has provided valuable insights into the profound impact of drought on the livelihoods of farmers in Kunene Region in Namibia. Through in-depth interviews and thematic analysis, the study uncovered the multifaceted challenges faced by farmers in drought-affected regions.

The study findings highlight the complex interplay of socio-economic, environmental, and psychological factors shaping farmers' experiences and responses to drought. Farmers reported significant disruptions to crop production, livestock health, and income stability, leading to heightened stress and uncertainty about their future livelihoods.

Despite these challenges, the study also reveals the resilience and adaptive capacity of farmers, who employ a range of coping strategies such as diversification, water conservation, and community support networks to mitigate the impact of drought on their livelihoods.

These findings underscore the importance of targeted interventions and policy initiatives to support vulnerable farming communities in adapting to climate change-induced drought. By addressing the specific needs and challenges identified in this study, policymakers, practitioners, and stakeholders can work towards building more resilient agricultural systems that ensure the sustainability and well-being of farmers and their communities.

Overall, this research contributes to a deeper understanding of the nuanced ways in which drought affects farmers' livelihoods and provides valuable insights for developing effective strategies to enhance resilience and mitigate the impacts of future drought events.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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