



Community Resilience and Drought Mitigation: A Literature Review

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Abstract

The review aims to evaluate the role of community resilience on reducing drought impacts. The paper addressed the nature, types, and impact of drought. It also, presented the significance of community resilience, and how it contributes to draught risk reduction. The paper argues that drought may be inevitable, still its devastation is not, demonstrating that community resilience as a bulwark against drought's bite, and strongly see community resilience as effective disaster resilience tool. The study suggests that reducing drought impacts can be achieved through mitigation and adaptation, with mitigation focusing on reducing drought severity and adaptation on adjusting to cope with it. The paper recommends improving water conservation, land management, and sustainable agriculture through drought-resistant crops, early warning systems, and establishing drought-resistant livelihoods. It also emphasizes community engagement, climate-smart adaptation plans, and supporting cultural traditions to foster social cohesion and benefit from traditional knowledge.

Keywords: Drought, Resilience, Community Resilience, Disaster, Hazard, Disaster Risk, Climate Change, Disaster resilience, Somalia

1. Introduction

Disasters are disruption of social and physical damages that exceed normal protections and the overwhelmed capabilities (Kemboi *et al.*, 2018) ^[21]. The danger of the natural and human made disasters has increased over last decades. Most of the Disasters frequently cause immediate shocks that suddenly disturbs communities' living conditions, while droughts gradually impact larger geographical areas, affecting their wellbeing and extending hazards to broader areas (Wassie *et al.*, 2022; Birhanu *et al.*, 2017) ^[51, 81]. The term drought conceptually articulates prolonged period of deficient precipitation that causes insignificant crop production and loss of harvest. Adversely, although there is no single definition appropriate to all conditions, the operational definition of drought designates the onset, severity and ends of drought.

Bothe concepts clearly show that drought multifaced natural hazards which badly millions of people causing significant damage to properties, environments, and economies, and posing challenges to policymakers. Governments, and institutions in recognizing and managing the adverse impacts and related risks to the drought (Tadesse, 2016) ^[46]. Drought is more recurrent disaster that relates to climate change, (Alkhalidi, *et al* 2023) ^[4], and increasingly effects economic, environmental, and social structures (Wassie *et al.*, 2022) ^[51]. It significantly impacts living standards, livelihood, health, nutrition and food security which, if relevant measures are not taken, ultimately reduces gradually community's capacity. Societies, institutions, and governments work hard and collaborate to reduce drought impacts and building community resiliency.

The concept of resilience is a relatively recent idea, and essential component in disaster risk reduction and management. Within its specific context, it may be defined as the system's capacity to bounce back from a malfunction and resume regular operations right away. According to Parsons *et al.*, (2016) ^[39] community resilience is the capacity of a community to withstand, absorb, adapt to, and recover from the effects of hazards in a prompt and effective manner, and to find stability in a newly changed situation by drawing lessons from its past.

Resilient communities are those that are effectively capable to manage and control losses from disruption and poverty caused by droughts (Koskei, 2022) ^[23]. There is an increasing interest from academics, researchers, policy makers, and practitioners in community resilience as it is fundamental to help communities manage stress, and build better their ability to adopt and recover from drought impacts and other climate related disasters (Cutter *et al.*, 2008) ^[12].

Due to the numerous catastrophic disasters that have struck the world in the past 20 years, the global interest and focus on community resilience to disasters has grown significantly (Saja, *et al.* 2021) ^[43], although, the actual impact of climate change on the local community remains uncertain (Klein *et al.* 2003) ^[22]. Many studies have been undertaken in various countries regarding this phenomenon, focusing on the dangers associated with drought and flood risks (Ward *et al.*, 2020) ^[50]. Broadly speaking, African countries extremely suffer the consequences of climate change (Wilhite *et al.*, 2014) ^[52]. According to findings of the contemporary studies, drought has affected millions of people across Africa including Botswana, Gambia, Ethiopia, Malawi, Niger, Namibia, South Africa, Zimbabwe, Sudan, and Somalia. In Somalia, the last severe drought in 2022 has affected more than 7 million people which are nearly 40% of total population and caused a displacement of 918,000 people and impacted nearly 435,000 children (OCHA, 2023). The situation was exacerbated by the poor governance, corruption, and unemployment (Adam & Kulmie, 2024; Kulmie, *et al.* 2023) ^[54, 25].

Additionally, the drought caused loss of lives, crop failures, severe acute malnutrition, and low school attendance. Further, it increased community vulnerability and exposure, towards drought hazard and caused loss of 40-60 % of the herds. This humanitarian crisis led an increased need of humanitarian intervention across Somalia to support 5.8 million people in need. Because of this, initiatives aimed at improving resilience to natural catastrophes and climate change have accelerated recently. Disaster resilience debates focus in building community resilience, systems, and environment (Gilbert, 2016) ^[16]. Numerous studies were conducted to explore the concept of drought, its impact on communities, and how these consequences are adapted to. Nonetheless, there is still a need for comprehensive research. Therefore, the purpose of this study is to evaluate how community resilience can mitigate the effects of drought on communities.

2. Methodology

The study investigates community resilience's role in reducing drought effects through a review of previous research, utilizing data from relevant articles, thesis, and books that are relevant to the variables being examined. The researchers selected documents closely related to the field of study and categorized them to satisfy the purpose of this study. The article provides an overview of drought, its basic types, and impact on the community, concepts of resilience and community resilience. It then explores key indicators and benefits of community resilience. This review article concludes by presenting the findings of an extensive literature review and offering recommendations based on these findings.

3. Review of Literature

3.1. Drought

Drought is a persistent climate-related issue that significantly

impacts human life, ecosystems, agriculture and water supplies in different ways, causing loss of life, food insecurity, and disruption of social livelihood and damage of the environment. (Tadesse, 2016 & Masih *et al.* 2014) ^[46, 30]. According to The Oxford English Dictionary (2011) drought is defined as the situation or state of being dry; dryness, dryness of the weather or climate, aridity, lack of moisture, and lack of rain. The World Meteorological Organization (1992) defines drought as a prolonged absence or marked deficiency of precipitation, resulting in severe hydrological imbalance, characterized by unusually dry weather (Lloyd-Hughes, 2014) ^[27]. Torabi *et al.*, (2020) ^[48] define droughts as unexpected decrease in rain over a period of time affecting the community and have critical impacts on sectors that are reliant on water resource i.e. agriculture. In short, drought is described as a shortage of water falls under the normal conditions. However, various Scholars including hydrologists, meteorologists, ecologists, environmentalists and agricultural scientists are all documented that drought is an environmental disaster which befalls under climatic situations such as high as well or low rainfall situations, temperatures, high winds, low humidity, timing and other characteristics of climatic variation (Mishra *et al.*, 2010) ^[33].

3.2. Types of Droughts

Ndayiragije *et al.* (2022) ^[35] and Tadesse (2016) ^[46] stated that the disciplinary perspective of the drought definition falls into four types: hydrological, meteorological, agricultural, and socio-economic. These types of droughts are categorized into two: physical drought quantification and water supply and demand analysis. Crausbay *et al.* (2017) ^[11] introduced ecological drought, a novel type of drought that considers environmental, climatic, hydrological, socio-economic, and cultural aspects in addition to commonly known droughts. Peters (2003) ^[40] identified groundwater drought as a significant factor in drought phenomena, as it results in reduced groundwater levels and discharges to surface water bodies. There are four types of drought discipline: meteorological drought, agricultural drought, hydrological drought, and socioeconomic drought. Meteorological drought is characterized by long-term precipitation deficiency. Agricultural drought involves reduced soil moisture availability. Hydrological drought occurs when precipitation deficiencies reduce surface and subsurface water resources. Socioeconomic drought affects human activities due to reduced precipitation and water availability. Socioeconomic drought is associated with elements of meteorological, agricultural, and hydrological drought, and can result in impaired growth and reduced yields (Torabi *et al.*, 2020) ^[48].

Orimoloye, *et al.*, (2022) ^[34] and Torabi *et al.*, (2020) ^[48] revealed the significance to identify the relationships between the different types of droughts, causes and the effects they have, specifically, when decision makers are willing to develop the strategies to overcome future challenges that result from the drought impacts. Nevertheless, drought is a dominant disaster that affects humans, systems, environment, social and economic. Therefore, if comprehensive drought planning is not implemented, the frequency and severity of droughts are predicted to increase in the future due to climate change.

3.3. Resilience: Basic Concepts

The concept of resilience is not new in scholarly literature. It

was defined by Holling in 1973, as the capacity to preserve system continuity, accept disruption and change, and preserve the consistency of the link between population and state variables (Park *et al*, 2020) ^[38]. The Oxford English Dictionary also defines resilience as the act of rebounding or springing back and elasticity. The term "resilience" originates from the Latin word "resilio," which translates to "to jump back" (Klein *et al* 2003) ^[22]. Resilience and vulnerability are dynamic process, and they have conceptual differences. Resilience is the ability of the community and the system to absorb impacts and cope with an event, as well as to respond and recover from disasters. It's a process of adaptation before, during and after the occurrence of an adverse event (Cutter *et al*, 2008) ^[12]. While vulnerability is inherent characteristics and abilities of social structures that generate the susceptibility for harm, meaning, that it is a function of the exposure that describes who or what is at risk and sensitivity of system which administrates the extent to which people and places can be damaged (Cutter *et al*, 2008) ^[12]. However, identifying vulnerable populations is a central for the overall community resilience programs (Abrash *et al*, 2021) ^[1].

3.4. Resilience: Disaster Management Perspective

Resilience is widely considered a desirable characteristic of both natural and human systems in environmental management. Resilience, a term used in various contexts, refers to ability to adapt and recover from the effects of stress, varying depending on the organization, individual, or environment (Park *et al*, 2020) ^[38]. Resilience in the context of disaster management refers to the capacity to return to pre-disaster conditions and may be categorized into three primary perspectives: stability, recovery, and transformation. Resilience is defined under the stability view as the capacity to maintain a pre-existing condition. According to this assumption, a system's resilience is determined by how much disruption it can withstand or absorb before changing into a different state.

The recovery view emphasizes a community's ability to recover from changes or stressors, allowing it to return to its original state (rehabilitation). The ability of a community to adapt to change is referred to as the transformation view. This involves changing to a more sustainable state in the current environment, rather than simply returning to a pre-existing state (reconstruction) or "bounce back better." Thus, mitigation and preparedness phases became essential when addressing these views, and the assumption of how resilience is determined, measured, enhanced, maintained, and reduced became vigorous.

3.5. Community Resilience

Marsh (2001) ^[29] describes community as a group of individuals with a variety of characteristics who are connected by social ties, share common values, and take part in cooperative action in particular settings or locations. Alshehri *et al*, (2015) ^[5] asserts that the term community has a geographic and physical component and can be used to define every person residing in a certain location. For this outlook, the concept of community resilience became significant within the context of disaster management. It is a contested concept, subject to various interpretations as reflected by the various existing definitions. According to Cutter *et al*, (2008) ^[12], Community resilience is a process linking the network of adaptive capacities (resources with

dynamic attributes) to adapt after a disturbance or adversity. Community resilience is intimately the condition of the environment and the behavior of its resources. The essential concept of the community resiliency is the sustainability, which is the ability to endure and overcome harm, damage, and distraction of life and system from an extreme event without substantial support.

Carmen *et al*. (2022) ^[9] defined community resilience as the active participation, advancement, and utilization of community resources by its members to cope with a changing, unpredictable, uncertain, and surprising environment. Several assessments have been conducted to identify the dimensions of community resilience with consideration of natural disaster from the global change, hazards, ecosystem, and political situation. However, due to its broad scope, the literature lacks a universally agreed definition of community resilience, but experts describe it as maintaining basic functions, using community assets, and becoming self-reliant (Abrash *et al* 2021) ^[1].

3.6. Components of Community Resilience

There are various methods for describing the essential components of community resilience. It comprises a mix of resources, social capital, information and communication, capacity to learn, ability to solve issues, work together, and transform. Toyoda (2020) ^[49] highlights three key aspects of community resilience. The first is the availability of resources to manage disruptions and loss resulting from hazard activity. The second one concerns the capacities and structures that communities and individuals need to coordinate, make use of, and deal with these resources in order to face difficult situations and adapt to the results of risky behavior. The third element focuses on community adaptation to showcase the well-being and standard of living of the populace.

Resilient communities are less susceptible to hazards and disasters than less sustainable communities (Cutter *et al*. 2008) ^[12]. Thus, the interest of developing integrated systems to improve community resilience to adverse climate shocks and pressure situation i.e. recurrent droughts becomes an emergent. A community with high drought resilience can, however, recover from even a protracted harsh drought without suffering significant harm (Park *et al*, 2020) ^[38]. So, a comprehensive drought plan is required to ensure a community's resilience.

4. Discussion

4.1. Key Resilience Indicators

There are huge studies that offer valuable perspectives on the connections between the frequencies of droughts, the harm they cause, and community resilience. Mihunov, at et., (2018) ^[32] carried out an in-depth examination of resilience to the drought risk of 503 counties of Oklahoma, Texas, New Mexico, Louisiana, and Arkansas, utilizing RIM (Resilience Inference Measurement) model, from 2000 to 2015. The researchers stated that identifying the factors that influence resilience is essential, and determined that economic, health, social, and agriculture sectors were recognized as the key indicators of resilience.

Communities should have effective plans integrating these aspects for better mitigation and development. Conducted research on US state drought plans with sample of 44 current state drought plans. The empirical analysis shows that 70% of the states pointed out drought impacts in their drought plan, while only 55% of them recorded their previous drought

experiences. The results also indicate that US state drought plans, while effectively addressing emergency responses, are generally weak in setting strong goals, mitigating, and adapting to climate change, involving public involvement, and updating plans, consequently, making their resilience very weak.

Summers *et al.* (2018) ^[45] utilized the Natural Hazard Resilience Screening Index tool to assess community resilience to natural hazards, using secondary data within the 2000–2015 timeframe as the data foundation in the development of NaHRSI, and found that Natural hazards consistently cause significant and long-lasting stress on the social, financial, and ecological systems of the US community. Additionally, researchers added that creating resilient environment to harmful hazards aid communities' success over time. Lastly, they suggested that to successfully develop capacity for resilience at multiple levels, joint responsibility is required. Mera (2018) ^[31] examined the effects of the drought in Ethiopia and concluded that the following are essential for overcoming disasters and development issues like drought: (i) well-planned infrastructure; (ii) sufficient funding; (iii) sound governance; and (iv) a supportive environment.

4.2. Community Resilience as Disaster Resilience Tool

According to Bindu & Vishnudas (2022) ^[7], the main approaches of minimizing disaster risk and mitigating its effects, include improving the efficiency of disaster response and increasing the resiliency of community towards disasters. They added that a resilient community can be created through improving its four pillars (social, economic, environmental, and institutional) and this cannot be achieved unless there are political will, strong leadership, and institutional capacity. Reviewed how drought hazards transfer to food insecurity. In their work, the researchers argued that it is vital to understand the linkages between drought and food security as it helps developing tools to reduce drought impacts and supports decision making.

The effects of drought, livestock, and agricultural goods on food security were extensively studied by Hameed *et al.* (2020) ^[17]. The study's findings reveal that the Middle East's most severe kind of drought is hydrological drought. Additionally, the results demonstrate that the region's drought had a negative impact on agricultural output. Drought and water shortages in agriculture may be mitigated, according to study by Labeledzki who also recommended taking a number of preventive steps to lessen the negative impacts of drought on agricultural goods. The development of water resources, according to the researcher, is the primary action that must be carried out through efficient irrigation water usage, improved water distribution, irrigation system repair, and irrigation system modernization. In order to effectively manage draught risk and foster strong community resilience, the report stressed the importance of national drought strategies and coordinated efforts to mitigate water shortage.

According to Savari, *et al.* (2023) ^[44], the households' ability to survive drought occurrences became a significant concern for all nations, particularly poor and developing countries, since recurrent droughts have threatened and weakened the resilience of the household. The study's findings demonstrated that the evaluated homes' livability levels were below average and that previous droughts had significantly lowered them. It also showed that 74.1% of the variation in rural families' livability during drought circumstances may be

attributed to social capital, which is defined as social awareness, collective action, social trust, and social involvement.

Social impacts of drought as stated Alston & Kent (2004) ^[6] are little known when compared to environmental and economic impacts of drought. The main social impacts of drought include substantial income erosion for farms and small businesses, increasing poverty, declining educational access and mental health problems. This study demonstrates clearly that men and women experience drought in different ways depending on their positions and responsibilities at work, and that drought is a gendered experience. The researchers argued that social impact assessment is necessary to identify its impact on businesses reliant on agricultural production, small inland towns' dependent and rural communities. This helps to improve the current health status and well-being of these groups for the purpose of reducing their vulnerability and promoting community level of resilience.

4.3. Benefits of Community Resilience

Social capital networks provide disaster-prone people and communities with access to vital resources including financial aid, informational help, childcare, and emotional and psychological support (Aldrich & Meyer, 2015) ^[3]. Social capital has been divided into three primary categories by scholars, including Aldrich & Meyer (2015) ^[3]: bonding, bridging, and linking. Bonding social capital refers to the emotional connections formed among close individuals, such as friends or family, resulting in tight bonds within a specific group. These types can be viewed as social support and personal assistance. Bridging social capital refers to loosely connected individuals across social groups (such as class or race, ethnicity, race, religion, identity), displaying demographic diversity and providing new information and resources for societal advancement (Kawamoto & Kim, 2019; Aldrich & Meyer, 2015) ^[20, 3].

Linking comprises networks of trusting relationships between individuals interacting across formal and explicit power or authority gradients in society. In other words, the linking SC concept refers to the connections between community members and external governmental, nongovernmental organization (NGO), and institutional actors. Put simply, bonding exists within networks, bridging arises between networks, while linking occur across vertical gradients (Aldrich, 2011) ^[2]. Over the past few years, several researchers including Zuhri, *et al.* (2023) ^[53]; Fenxia, (2022) ^[14]; Cohen *et al.* (2013) ^[10]; Norris *et al.* (2008) ^[36] indicated that resilience has drawn more and more attention as a crucial concept in disaster preparedness, emergency response, and crisis recovery. These studies found that a social support network combines community resilience with individual preparedness and responsiveness to resist and recover from catastrophe events. The existing literature shows that community resilience is influenced by the environment (Joerin *et al.*, 2012) ^[19], which upsurges communities' vulnerability and exposure to drought impacts. Thus, community resilience is understood, in money countries as an integrated structure that supports a community's capacity to use its resources to react, withstand, and recover from dangerous events. Additionally, studies show that resilient enhance social and government integration and boost population health both physically and mentally.

Resilient communities are better equipped to anticipate,

prepare for, and respond to disasters. These communities have established systems for early warning, evacuation plans, and resource mobilization, leading to faster and more effective responses when disaster strikes (Longstaff, *et al.* 2010) [28]. Resilience in communities involves mitigating risks and addressing vulnerabilities through infrastructure strengthening, livelihood diversification, and resource access, thereby reducing the likelihood of severe disaster impacts (Dodman, *et al.* 2012) [13]. This means that community resilience reduces their vulnerability to disaster risks. Adaptation and resilience can mitigate climate change risks, enhance living conditions, and support meeting with development goals. Resilience involves addressing long-term challenges like climate change and resource scarcity, enabling communities to build a sustainable future and reduce vulnerability to future shocks, beyond just immediate disaster response. Also, building community resilience can significantly enhance their ability to address food insecurity. Food insecurity is a major global problem that affects millions of people and presents considerable issues for socioeconomic development and environmental management (Rockström, 2003; Ibrahim, *et al.* 2024) [42, 55]. Most of these individuals reside in poor nations. Building community resilience is therefore required; it is not an option.

5. Conclusion and Recommendation

This review aimed to assess the role of community resilience in reducing draught impacts. Drought is a significant threat that causes significant harm to agricultural, hydrologic, and ecological systems, affecting human health and economic prosperity. Investing in early warning systems, diversifying livelihoods, and conserving water resources are essential, but collective spirit is crucial for communities to leverage traditional wisdom and innovate solutions. However, climate change is predicted to increase the frequency, duration, and intensity of drought. One of the key approaches to prevent and mitigate that risk is building better community resilience. Community resilience has become an essential concept in disaster risk reduction and management. It is a proactive approach offering localized solutions by empowering communities to address root causes. It promotes long-term sustainability. This is why community resilience is vital in mitigating drought impacts. By fostering cooperation, knowledge sharing, and proactive adaptation, communities can become fortresses against drought's impact.

The study concluded that reducing drought impacts can be approached from two main angles: mitigation and adaptation. Mitigation refers reducing the severity of droughts while adaptation means adjusting to cope with droughts. However, the paper recommends enhancing water conservation and land management and promoting sustainable agriculture by utilizing drought-resistant crops. It also recommends improving drought forecasting and monitoring by using early warning systems, which can help communities prepare for and respond to droughts more effectively. This can also increase drought awareness and preparedness. Moreover, the paper emphasizes the importance of establishing drought-resistant livelihoods. Additionally, it is important to promote community engagement in drought-resistant strategies and programs and develop climate-smart adaptation plans while also utilizing technology and innovations. The paper also suggests supporting cultural traditions to create social cohesion and benefit the community's traditional knowledge and problem-solving skills.

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