

The Resilience Deficit: Community-led Drought Disaster Mitigation Pathways in Masvingo Rural District, Zimbabwe

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Abstract

Rural communities in Zimbabwe's Masvingo Rural District face a pervasive 'resilience deficit' characterised by increasing vulnerability to recurrent droughts. Exogenous disaster risk reduction (DRR) strategies have fallen short of sustaining local absorptive and adaptive capacities. This study addresses this gap by identifying and systematising community-led pathways for drought disaster mitigation. The research is underpinned by the Community-based Disaster Risk Reduction (CBDRR) Theory that places people at the centre of all response mechanisms. The Resilience and Complex Adaptive Systems (RCAS) Theory is also employed in this research. Using a rigorous qualitative meta-analysis methodology, this research synthesises empirical evidence from multiple case studies, project reports, including grey literature spanning three decades (1990-2025). The analysis distils successful endogenous practices like small grain cultivation, water harvesting and indigenous early warning systems, delineating socio-political and institutional factors that enable or constrain their efficacy. The findings reveal that effective community-led pathways are not merely technical but are fundamentally underpinned by local knowledge co-production, collective action and equitable access to natural resources. This study concludes that bridging the resilience deficit requires a fundamental shift towards polycentric governance models that formally recognise, support and integrate community-led initiatives into mainstream climate adaptation policy. The study propounds a critical evidence-based resilience framework.

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INTRODUCTION

Droughts in sub-Saharan Africa, intensified by climate change, expose fragile agrarian livelihoods and weak disaster governance. While the African Union (AU) and the Southern African Development Community (SADC) have advanced DRR frameworks, they remain largely aspirational, undermined by poverty, environmental degradation and climate variability (Mavhura, 2020). The 2015-2016 El Niño-induced drought, which affected millions, highlighted both vulnerability and inadequate preparedness (UNWFP, 2016). In Zimbabwe, governance deficits are acute: the absence of decentralised structures and marginalisation of traditional institutions weaken adaptive capacity (Manyena, 2020). Reliance on top-down approaches, common across the Global South, constrains community-based DRR strategies (Mavhura, 2020; Nyahunda *et al.*, 2022). Vulnerability stems less from climatic stressors than from governance failures that limit resilience-building.

Rural communities remain highly exposed to droughts, floods and cyclones (Ndhlovu, 2022). Severe droughts in 2015-2016 and 2018-2019 (Manyena, 2020; Mavhura, 2020), underscore the need for institutional support to link national policy with local action. Yet minimal climate financing, including limited Green Climate Fund allocations, leaves communities under-resourced. Masvingo Rural District exemplifies this “resilience deficit”—the widening gap between climatic shocks and institutional or community capacity (Manyena, 2020). Historically, centralised, command-and-control drought management has privileged scientific data over local knowledge, producing misaligned interventions (Matsa, 2020). This study conducts a meta-analysis of two decades of drought responses in Masvingo to identify community-driven practices, examines institutional enablers and barriers and explores integration into a polycentric governance system. Such systems, with overlapping centres of decision-making, can bridge the resilience deficit by resourcing endogenous pathways of resilience.

CONCEPTUAL FRAMEWORK

This study’s conceptual framework examines how formal and informal DRR institutions shape community resilience in Masvingo Rural District. It explores the interplay between institutional effectiveness and community knowledge, attitudes and perceptions, focusing on how these perspectives converge or diverge to influence collective resilience. Anchored on the CBDRR Theory and RCAS Theory, the framework assesses the impacts of recurrent droughts and the adaptability of socio-ecological systems. Key variables include institutional efficacy, community perceptions of risk, alignment between institutional and local perspectives, the chronic nature of droughts and the pursuit of a context-specific, inclusive CBDRR support system. The framework illustrates how institutional structures and community-based strategies interact to either mitigate or exacerbate resilience deficits, with the ultimate goal of identifying pathways toward sustained disaster preparedness and collective resilience.

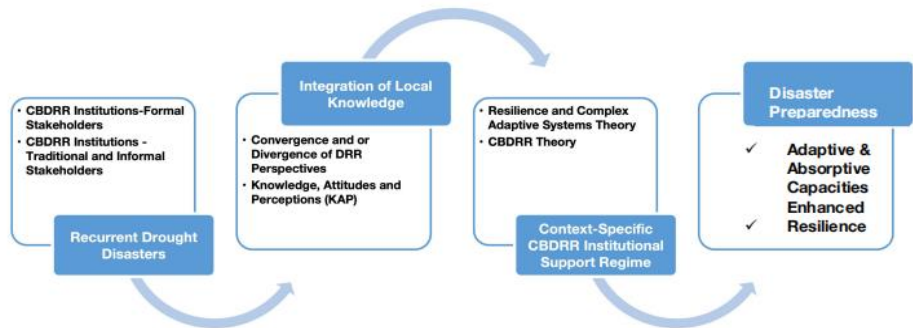


Figure 1: *A Schematic Representation of the Conceptual Scope of the Study*

The conceptual framework guiding this study begins by identifying both formal and informal CBDRR stakeholders, ranging from government agencies and NGOs to traditional leaders and community groups, whose roles are critical in shaping local responses. The framework then emphasises the integration of local knowledge, including indigenous perceptions and practices, with formal DRR perspectives. This convergence is explored through the lens of Knowledge, Attitudes and Perceptions (KAP), which helps reveal how communities interpret and respond to drought risks. Building on this, the framework introduces a context-specific CBDRR institutional support regime

informed by the RCAS Theory, and the CBDRR Theory. These theoretical foundations enable the analysis of how institutions adapt, learn and support community agency. Ultimately, the framework links these elements to disaster preparedness outcomes, focusing on the development of adaptive and absorptive capacities that enhance long-term resilience. This progression, from stakeholder mapping to knowledge integration, institutional support and preparedness, provides a coherent structure for analysing how community-driven strategies can be embedded within inclusive, multi-level governance systems.

THEORETICAL FRAMEWORK

This study is informed by the CBDRR Theory and the RCAS Theory. CBDRR, first articulated by Maskrey (1989) and later advanced by Twigg (2004), is grounded in the philosophy that disaster risk reduction is most effective when communities themselves are central actors, drawing on indigenous knowledge and participatory practices (Maskrey, 2011). It assumes that local agency and traditional systems are critical for building resilience and in this study, it underscores the importance of integrating drought-tolerant crops and indigenous forecasting methods in Masvingo. RCAS, originating from Holling's (1973) Resilience Theory and expanded by Folke *et al.* (2010) and Ostrom (1990), views socio-ecological systems as dynamic, adaptive and interconnected across scales. It assumes resilience emerges through diversity, feedback loops, adaptability and transformability and is applicable here in framing drought resilience as a systemic issue shaped by governance, institutions and ecological processes. Together, these theories provide a lens for analysing how resilience deficits in Masvingo arise not only from climatic stressors but also from institutional and governance constraints.

The CBDRR Theory (Maskrey, 2011) argues that communities are active subjects in the process, rather than passive objects and mere recipients of external interventions. Through a process of CBDRR, communities at risk identify and prioritise their problems, and select contextually appropriate solutions. Walter Frederick Buckley, a social scientist, was among the pioneers in the application of the term “complex adaptive system”, grounded in the Complexity Theory. Bentley and Anandhi (2020) argue that this concept elucidates how collective behaviours and self-organising patterns emerge from a

multitude of interactions among the components within a system, and between these components and their surrounding environment.

The RCAS Theory further states that practitioners ought to treat the issue of resilience as an open-systems process that is constantly changing due to the inflow and outflow of information (learning from past events) and building and breaking up of components (adding new resilience capacities/removing absolute capacities) that constitute the resilience profile of a community (Coetzee *et al.*, 2016). The resilience approach to complex adaptive systems has been interlinked with sustainability science. Sustainability science, researchers argue, is characterised more by the challenges it seeks to address rather than by the disciplines it encompasses. A fundamental emphasis of sustainability science is on facilitating transitions towards sustainability, which includes enhancing society's capacity to utilise the earth in ways that concurrently fulfil the needs of an increasingly populous yet stabilising human demographic, preserve the planet's life support systems and significantly alleviate hunger and poverty (Matson *et al.*, 2016). Most relentless environmental and natural resource challenges are often exacerbated by the failure to acknowledge that ecosystems and the societal frameworks that utilise and rely upon them are profoundly interconnected (Biggs *et al.*, 2015). Within the framework of resilience thinking, social and ecological systems are intertwined, exhibiting emergent properties and capable of existing in qualitatively distinct states or basins of attraction (Folke, 2016; Araja, 2022). Humans, as agents within socio-ecological systems, shape emergent structures in diverse manners influenced by their cultural systems (Folke, 2016).

The work that state and non-state actors are putting in towards DRR efforts, poverty, adaptability, food security, social protection, adaptive capacity and resilience of individuals, households and groups in relation to ecosystem and environmental change in general and climate change in particular (*ibid.*), within the study area, are interrogated against these two major theories (Araja, 2022). Humans shape emergent structures in socio-ecological systems influenced by cultural systems. State and non-state actors work towards DRR, poverty, adaptability, food security, social protection, adaptive capacity and resilience in

relation to environmental and climate change. The study area interrogates efforts against major theories.

LITERATURE REVIEW

This section situates drought disasters within the RCAS Theory, showing how recurrent crop failures in Masvingo reflect rigidity traps and resilience deficits, while indigenous practices embody emergent adaptive strategies. Governance is critiqued as a key determinant of resilience, with centralised, top-down institutions reinforcing path dependency and vulnerability, whereas adaptive governance aligns with CAS principles of self-organisation, diversity and learning. Resilience is reframed as a multidimensional “currency”, encompassing adaptability, transformability and risk-sharing, with nature-based solutions and social capital strengthening socio-ecological systems. Ultimately, the “resilience deficit” emerges when consecutive shocks overwhelm adaptive cycles and institutional support fails, underscoring that vulnerability is systemic, rooted in governance and institutional constraints as much as climatic stressors.

The study sought to focus on the patterns of the drought disaster and the resilience deficits that have been observed over the years within the study area and other regions under a similar context, mainly from the global south. For a long time, the promotion of hybrid maize, a water-intensive crop, in semi-arid regions like Masvingo has repeatedly failed, exacerbating food insecurity (Mugambiwa, 2018). In response, a growing body of literature is advocating for community-based adaptation mechanisms, fashioned through the integration of Indigenous Knowledge Systems (IKS) (Makondo, 2018). Studies in much of Masvingo Province have highlighted specific local practices, such as the use of finger millet (*zviyo*) and sorghum (*mhunga*), which are more drought-tolerant than maize (*mabagwe*) (Mavhura *et al.*, 2013) and indigenous weather forecasting using animal behaviour and plant phenology (Muguti and Maposa, 2012). While valuable, these studies often remain context specific. This research synthesises these fragmented insights through meta-analysis to build a more comprehensive and generalisable understanding.

DROUGHT GOVERNANCE AND INSTITUTIONS

Historically, drought was seen as a natural disaster, leading to reactive crisis management (Vogel *et al.*, 2010). This approach addressed only the symptoms,

fostering dependency and providing few incentives to manage resources better. Nowadays, drought is viewed as a natural event requiring proactive preparedness to reduce vulnerability and enhance resilience (Crossman, 2018). Disaster response must cover the entire management cycle to be sustainable. When institutions fail to be proactive, disasters like drought stop being natural. The disaster management cycle is continuous if resilience is the goal (Mavhura and Mapuva, 2021). Recent studies have shown that the drought conundrum cannot be discussed meaningfully without emphasising the governance and relative institutional dimensions. Governance processes, intricately linked to various institutional expressions, also shape the utilisation of environmental resources (Olsson *et al.*, 2004). Central government-led institutional frameworks and support systems tend to prop up bureaucratic or top-down resource management, wherein the expertise of external authorities such as scientists, is frequently solicited to address local resource challenges due to perceived deficiencies in local knowledge (Matlala, 2025). Constricted forms of governance, characterised by rigid state and regional responses that remain entrenched in the historical contexts that originally prompted reactive drought interventions, can hinder the development of local drought resilience.

Institutions of diverse types serve as valuable mechanisms to evaluate whether communities are evolving to innovate in response to climate change (Vogel *et al.*, 2010). Institutions are pivotal to drought governance as they influence adaptation to climate change by structuring impacts and vulnerabilities; that is, by mediating between collective and individual responses to impacts and adaptation, while also functioning as conduits for resource delivery and access to resources that facilitate adaptation (Agrawal 2008). Institutions and adaptive governance, often closely intertwined, refer to the evolution of rules and norms that govern society (Ostrom 1999). Furthermore, Vogel *et al.* (2010) argue that institutions can either empower or inhibit by presenting opportunities or obstacles to various implementation actions aimed at mitigating risks associated with environmental change, particularly those stemming from drought. Ultimately, institutions also play a crucial role in framing and conceptualising knowledge, providing the vehicles (for instance, regulatory, policy and legal frameworks) through which interventions, responses and feedback mechanisms of management and action transpire.

THE RESILIENCE CURRENCY

The concept of ‘resilience’ has become central to disaster studies, shifting focus from mere resistance to the capacity of systems, to adapt and transform in the face of disturbance (Folke *et al.*, 2010). In the context of Southern Africa’s drylands and semi-arid landscapes, resilience is intrinsically linked to livelihood diversification, social networks and ecological knowledge (Tanner *et al.*, 2015). The term “resilience” has gone through a rapid metamorphosis over the last three decades as scholars sought to unpack its true meaning and relevance to the social sciences. Maxwell (1996) argues that the conventional view of food security was of food as a primary need, a lower-order need in Maslow’s 1954 hierarchy of needs and that in recent years, however, the assumptions underlying this view have been questioned. It has been recognised that food, especially short-term nutritional intake, is only one of the objectives people pursue.

Maxwell (1996) argues that de Waal, researching in 1989 realised that in the 1984-1985 famine in Darfur, Sudan, people chose to go hungry to preserve their assets and future livelihoods. This has proven that people are prepared to go through hunger and famine to some extent if it prolongs the lifespan of their livestock, grain stocks and so on. In other words, one can argue, people are prepared to “suffer” as a form of resilience. Resilience as a currency entails reducing drought exposure and vulnerability, sharing and transforming risks, strengthening communities and ecosystems to anticipate and recover and embedding preparedness, response and recovery through monitoring and early warning systems (Crossman, 2018).

This study examines resilience in socio-ecological systems facing change, persisting and evolving within stability. Adaptability is crucial in allowing systems to adjust to external factors. Transformability involves creating new stability domains and resilient systems must withstand events while maintaining functions and capacity for change. Therefore, resilience building involves fostering elements for adapting to change, maintaining diversity and providing self-organisation opportunities (Davidson *et al.*, 2016). A resilient community integrates nature, which embodies community resources used by members to flourish in an unpredictable environment during drought seasons (Magis, 2010).

Ideal approaches to resilience examine adaptive capacities, community attributes and resilience-building processes in practice (Berkes and Ross, 2013), including, monitoring, evaluation, accountability, learning and safeguarding.

Crossman (2018) suggests that a proactive approach to enhancing drought resilience involves managing land and water resources judiciously. Preventing land degradation, protecting and restoring natural capital and ecosystem services through land rehabilitation and ecological restoration and allocating water for environmental flows, will strengthen ecological, economic and social systems against drought impacts. Crossman (*ibid.*) further argues that nature-based solutions for drought management provide ecological benefits, mitigate risks from natural disasters and help in climate change adaptation.

Building effective resilience to periods of drought is a formidable endeavour, necessitating not only a response to the anticipated magnitude of change (the drought as a hazard), but also a profound understanding of the system's capacity to learn and innovate amid uncertainty and transformation, thereby strengthening adaptive capacities (Vogel *et al.*, 2010). Fostering collaboration among diverse stakeholders is crucial for enhancing resilience by sharing knowledge, resources and innovative practices. Engaging communities, policymakers and scientists helps identify vulnerabilities and implement sustainable management strategies. This participatory approach builds social capital and empowers local populations to take ownership of resilience initiatives. Proactive strategies to diminish drought risks should include enhanced monitoring, forecasting, early warning systems and comprehensive assessments for at-risk communities. However, the 'resilience deficit' arises when external shocks, such as consecutive droughts, overwhelm these inherent capacities and institutional support is lacking or maladaptive (Mavhura, 2020).

RESEARCH METHODOLOGY

The study is geographically delimited to the Masvingo Rural District of Zimbabwe, located in the south-eastern part of the country. This region has been identified as one of the most vulnerable areas in Zimbabwe, facing recurrent droughts, water scarcity and other climate change-induced disasters.

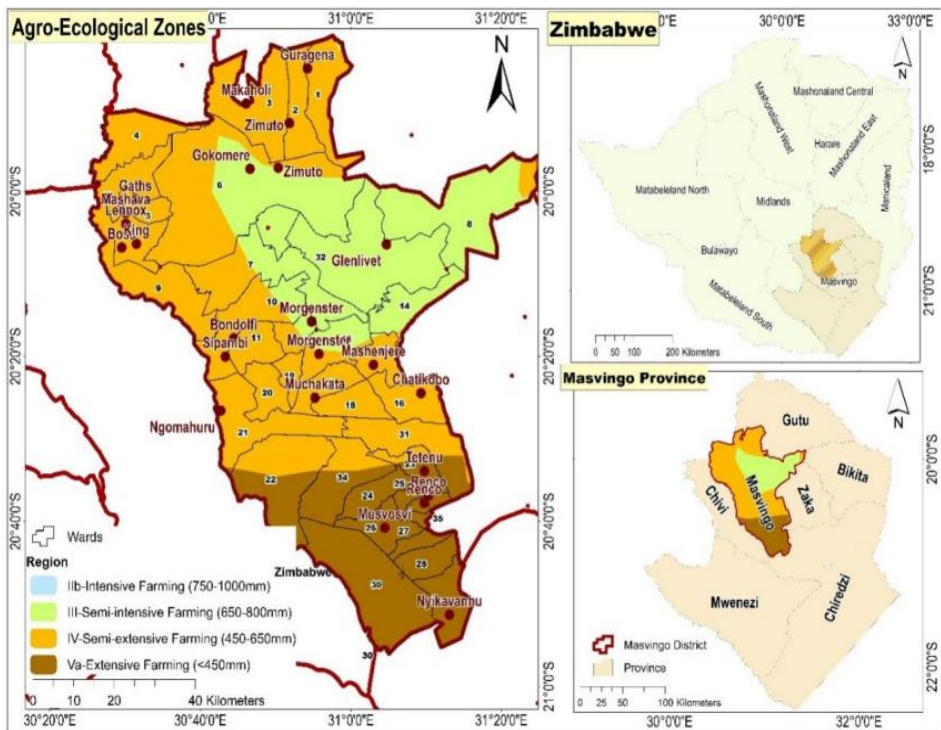


Figure 2: Masvingo Rural District Agro-Ecological Zones (University of Zimbabwe's Environment, Climate and Sustainable Development Institute (UZECSDI))

Masvingo District, located in agro-ecological regions IVa, IVb and V, receives low rainfall and has been increasingly affected by recurrent and intense droughts. Since 2000, the district has experienced eight drought years, including the 2023-2024 El Niño event, leading to poor yields and chronic food insecurity (Frischen *et al.*, 2020). In the absence of food assistance, households resort to negative coping strategies such as reducing meals and portions, school absenteeism and dropouts, early marriages, prostitution, unsustainable resource harvesting and distress livestock sales (Tsegaye *et al.*, 2018). Women and girls are disproportionately affected, facing heightened risks of gender-based violence and forced marriages. Rising demand for cereals drives up market prices, further limiting access to food, while outward migration of men and youth reduces household labour capacity, compounding vulnerability.

The study is grounded in the Interpretive Research Paradigm, which, through its hermeneutic spirit, informs the qualitative meta-analysis. This paradigm guided the systematic review by providing a structured approach to gathering and synthesising literature, while also shaping the analysis and interpretation of qualitative data to generate new insights. The research design is qualitative, focusing on individual perspectives and lived realities, with the meta-synthesis process aimed at interpreting primary study findings to build deeper understanding.

This study employed a qualitative meta-analysis (Timulak, 2009), involving the systematic review and integration of findings from multiple primary qualitative studies. The meta-synthesis aggregated evidence on drought resilience, CBDRR and RCAS to identify cross-cutting themes and generate higher-order conclusions. A structured rubric on resilience thinking, science and community perspectives guided the collection of relevant literature, enabling a rigorous review of studies from Southern Africa, Sub-Saharan Africa and beyond. Through this systematic approach, the study examined the evolution of resilience, CBDRR and RCAS across diverse contexts to enhance methodological integrity and applicability.

Meta-synthesis, a research method that systematically integrates findings from multiple qualitative studies, was employed in the study. The research combined insights, themes and concepts to develop a new, more comprehensive interpretation of the drought disaster at the community interface. The following key search parameters were used: Community Resilience; Resilience Thinking; Resilience Science; the Community Based Disaster Risk Reduction Theory; the Drought Resilience and Complex Adaptive Systems Theory; Resilience Deficit; Mitigation; Indigenous Knowledge; and Polycentric Governance Searches were conducted from the University of Zimbabwe's online library portal, specifically JSTOR, African Journals Online (AJOL), Taylor and Francis, Project Muse and Wiley Online. During the search, a total of 14,154 results were realised and further narrowed to specific subjects of interest until manageable numbers were achieved. This was achieved through temporal and theoretical delimitations. Grey literature was also synthesised to triangulate the credibility of journal articles and what multi-lateral organisations and national institutional reports

are detailing periodically. Bias was minimised through explicit inclusion and exclusion criteria, systematic search strategies, critical appraisal of study quality and cross-validation across peer-reviewed and grey literature to ensure methodological rigour.

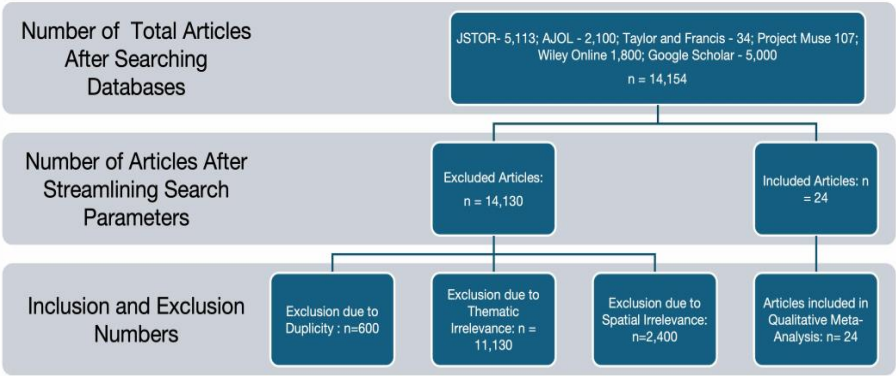


Figure 3: *Flow Diagram of the Literature Review Selection*

The research streamlined articles by selecting a mean number of research items included per search parameter or thematic area. Temporal and spatial parameters were also prioritised in coming up with the consensus structure using word mapping to observe the frequency and consistency of certain terms in different sampled articles. Studies were included if they: (i) were empirical investigations; (ii) focused specifically on drought responses; (iii) involved primary data collection within Masvingo Rural District; and (iv) were published between 1990 and 2025. The choice of a broad timeframe spanning 1990 to 2025 is deliberate, reflecting both historical depth and contemporary relevance. Beginning in 1990 allows the study to capture the post-independence evolution of disaster governance in Zimbabwe, including the early institutional responses to droughts and the onset of structural adjustment programmes that reshaped rural livelihoods. This period also coincides with the major 1991-1992 drought, widely regarded as one of the most severe in Southern Africa, which set a benchmark for subsequent resilience and policy debates.

The selected studies (n=24) were coded using a thematic analysis framework. Initial codes identified specific local practices (for example, small grains

cultivation, granite and earthen dams for water harvesting). These were then grouped into broader categories or ‘pathways’ (for example, Agricultural or Livelihood Diversification, On-farm and Off-farm Income Generating Activities, Water Resource Management). Axial coding was applied to link community practices with institutional dynamics, revealing enabling factors such as participatory governance and indigenous knowledge integration and constraining factors like limited financing and centralised decision-making. Through a meta-synthesis of drought-related research in Masvingo, open and axial coding traced these dynamics, showing how community-driven practices can be embedded within polycentric governance frameworks to address Zimbabwe’s resilience deficit and inform policy and practice. WPS Office AI supported the paraphrasing and summarisation of cited literature.

FINDINGS

Communities in Masvingo are proactive agents of resilience, employing strategies such as small-grain diversification, community-based water harvesting and indigenous early warning systems with livelihood diversification. These efforts strengthen resilience but are constrained by insecure land tenure, gender exclusion and maize-focused policies. The meta-analysis shows that the resilience deficit stems not from a lack of local knowledge, but from governance failures to support endogenous pathways. It calls for a polycentric governance system (Ostrom, 2010), where overlapping decision-making centres collaborate to embed local practices into broader resilience frameworks.

EMERGING PATTERNS AND FREQUENCY OF DROUGHT DISASTERS

Drought occurrence in Zimbabwe has shown significant temporal and spatial heterogeneity from 1990 to the present. Analysis of drought patterns reveals increasing frequency and intensity over time, with the decade of 2000-2020 experiencing more frequent droughts compared to the 1990-2000 decade. The most severe drought events were recorded in 1991/1992, 1994/1995, 2002/2003, 2015/2016 and 2018/2019, with the decade (2020-2024) showing continued recurrence.

Table 1: *Chronology of major drought events in Masvingo Province (1990-2024)*

Drought Period	Severity Classification	Key Impacts Documented
1991 -1992	Extreme	Widespread crop failure, livestock deaths, emergency food aid required
1994 - 1995	Severe	50% - 70% crop reduction, water sources depletion
2002 - 2003	Extreme	National food crisis, massive livestock losses
2015 - 2016	Severe to Extreme	El Nino-induced, more than 60% crop failure, humanitarian emergency
2018 - 2019	Severe	Consecutive poor rainfall seasons, depleted coping strategies
2022 - 2023	Moderate to Severe	Record-low rainfall, compounded by economic challenges

Spatially, Masvingo Province consistently emerges as one of the most drought-affected regions in Zimbabwe, alongside Matebeleland. The increasing frequency of drought events has reduced the recovery period between shocks, progressively eroding household resilience and traditional coping mechanisms. This pattern aligns with broader regional trends in Southern Africa, where drought recurrence every three to four years has become increasingly common.

IMPACTS ON LIVELIHOODS AND FOOD SECURITY

The drought impacts Masvingo's rural communities with crop yield reductions, especially maize. The 2015-2016 drought led to over 60% crop failure, requiring large-scale intervention. Drought causes cascading effects on food systems, depleting assets and leading to food shortages (Mavhura 2020).

INCOMES, INSECURITY AND ECONOMIC IMPACTS

Drought recurrence has profoundly destabilised income sources for rural households in Masvingo, most of whom depend on rain-fed agriculture for their subsistence and livelihoods. Crop failure directly translates into income losses through reduced agricultural sales, while simultaneously forcing households to allocate limited resources to purchase food that would otherwise be produced on-farm. The economic impacts extend beyond immediate household levels to community-wide effects. Drought-induced reduction in agricultural production diminishes labour opportunities, reduces local market activity and depletes financial resources through increased debt burden.

COMMUNITY RESILIENCE AND ADAPTATION STRATEGIES

Despite the severe challenges posed by recurrent droughts, rural communities in Masvingo have developed diverse resilience strategies to mitigate impacts and maintain livelihood security. The meta-analysis revealed three principal community-led mitigation pathways, each with distinct practices and underlying socio-institutional dynamics.

PATHWAY ONE: AGRICULTURAL DIVERSIFICATION AND INDIGENOUS AGRONOMY

The most documented pathway involves a shift from maize monoculture to drought-tolerant small grains. As one study noted, "*rukweza ne mhunga* are our life insurance; they might not yield a lot, but they always yield something" (cited in Mavhura *et al.*, 2013:45). This practice is often combined with indigenous soil and water conservation techniques, such as *zai* (egg) planting pits. Local smallholder farmers have adopted various climate smart agriculture techniques, including optimal water resource utilisation, drought-tolerant early-maturing seed varieties adoption, soil and water conservation and nutrient management. Despite constraints, rural farmers actively engage in these adaptive practices, which have been shown to improve prospects for securing income essential for accessing critical services. The success of this pathway, however, is constrained by market forces and government policies that continue to favour maize through input subsidy programmes (Matsa, 2020) such as the Presidential Input Scheme for all smallholder farmers.

PATHWAY TWO: COMMUNITY-BASED WATER HARVESTING AND MANAGEMENT

Communities have revived and adapted traditional water management systems. This includes the construction of small-scale granite and earth weirs to capture runoff and the collective management of village wells. These systems are often governed by traditional leadership, ensuring equitable distribution and utilisation during dry periods (Mavhura 2020). A key finding is that the effectiveness of these structures is highly dependent on strong social cohesion and collective labour (*nhimbe*). This directly speaks to integrated community response mechanisms that strengthen collective resilience. Community cohesion plays a vital role in drought resilience through resource pooling, knowledge sharing and collective response initiatives. Where social capital has been eroded, these systems fall into disrepair. External support mechanisms have

strengthened community resilience to a limited extent as the interventions tend to be minimalistic in nature and cannot satisfy half the need and demand. Interventions such as the R4 Rural Resilience Initiative have introduced integrated risk management approaches, combining improved agricultural practices with risk transfer mechanisms like insurance. These programmes have demonstrated success in building household resilience at a limited scale and challenges remain in achieving long-term sustainability.

PATHWAY THREE: INDIGENOUS EARLY WARNING AND LIVELIHOOD DIVERSIFICATION

Local communities have chosen to go back to the foundation, to the basics where their survival depends on the harmony and balance that they create with their natural environment. Listening to the rhythm of nature, communicating and resonating with the environment has yielded life for man since time immemorial. Communities across the district rely on a sophisticated knowledge system for seasonal forecasting, observing indicators such as the flowering of the fig tree (*muonde*) and the behaviour of certain bird species (Muguti and Maposa, 2012). These forecasts inform critical decisions on planting dates and crop selection. Furthermore, based on these endogenous predictions, households diversify into non-agricultural livelihoods like artisanal crafts and petty trading, a strategy extensively documented as a core resilience mechanism (Tanner *et al.*, 2015). Households increasingly rely on non-agricultural income sources during drought periods, including temporary migration, art and craft production (for selling through tourism corridors that exist across the district, for example, Great Zimbabwe Monuments, the Beitbridge Masvingo Harare Highway) and various small-scale trading ventures. This diversification provides crucial safety nets when agricultural production fails. As a negative coping mechanism, unemployed youth turn to the abundant natural capital as they resort to wildlife poaching in most parts of the district close to national game parks, such as Lake Mutirikwi Game Park, Mushandike Game Park, Nyanda Resort, Gonarezhou National Park, Save Conservancy and other private game farms. Poaching also extends to the wild capture fisheries in many large-scale and medium to small-scale water bodies, such as Tugwi Mukosi, Lake Mutirikwi, Tugwane Ngundu, Magudu, Rupike, Bangala, Mushandike dams, among many others.

THE CROSS-CUTTING ROLE OF GOVERNANCE AND POWER

The analysis consistently shows that technical practices alone are insufficient. The enabling environment is crucial. Factors such as insecure land tenure under the post-fast-track land reform landscape disrupt long-term investment in land conservation (Matsa, 2020). Furthermore, gender dynamics are pivotal; women, as primary farmers, are custodians of much indigenous knowledge but are often excluded from decision-making fora, limiting the scope and adoption of effective practices.

Table 2: *Summary of key enabling and constraining factors alongside their impacts on resilience.*

Factor Type	Specific Factors	Observed Impact on Resilience
Enabling Factors	Participatory Governance	Strengthens community decision-making and adaptation
	Indigenous Knowledge Integration	Enhances local relevance and sustainability
Constraining Factors	Centralised Decision-making	Limits community autonomy and responsiveness
	Limited Financing	Restricts resource availability and project scaling

DISCUSSION

For decades, drought disaster responses have been dominated by top-downism, external interventions that prioritise short-term humanitarian relief over long-term, sustainable adaptation (Mugambiwa, 2018). These approaches, while often necessary in emergencies, have been criticised for creating dependency and undermining local innovation. Communities in the district continue to experience frequent droughts, water scarcity and crop failures (Mpala and Simatele, 2024). Masvingo Rural District is characterised by a semi-arid to arid climate and is situated in the low-lying region of Zimbabwe. The district experiences erratic rainfall patterns and is prone to prolonged dry spells, making it susceptible to drought conditions. The problems of Masvingo rural are worsened by the district's over-reliance on rain-fed agriculture for sustenance (Sibiya *et al.*, 2022). However, amidst these debilitating challenges, communities in Masvingo have not been passive victims, waiting on fate. They have continuously sought within, developed and deployed indigenous knowledge systems and local practices to mitigate the impacts of the endemic drought disasters (Mavhura *et al.*, 2013). Yet, these grassroots, community-led

pathways remain largely unacknowledged, undocumented, fragmented and absent from formal policy and implementation frameworks. The frequency and intensity of drought disasters in Masvingo Rural District exceed traditional coping mechanisms, revealing a troubling trend of climate stress. Drought recurrence every three to four years, with severe to extreme events once or twice per decade, creates a cycle of vulnerability that hinders full recovery, resulting in a pronounced "resilience deficit". This finding aligns with broader regional observations in Southern Africa, where governments have struggled to prioritise strengthening collective community resilience mechanisms to cyclical drought-induced disasters, often leading to reactive dispositions that undermine development gains (Kamakaula *et al.*, 2025). This has seen most state-led interventions accruing negative perceptions instead of development benefits.

The apparent disproportionate impact of drought on women, girls and other vulnerable groups, such as the elderly and people with disabilities, deserves particular attention. Gender-specific findings from resilience programmes indicate that women experience significant improvements in food security when supported with appropriate interventions, suggesting they bear the heaviest burden during normal drought periods (Lombe *et al.*, 2024). Women tend to eat less and last every mealtime as they bear the brunt of drought-induced household food deficits. Similarly, youth involvement in resilience programmes has been disproportionately concentrated in physical asset construction rather than agricultural and entrepreneurial training, potentially limiting long-term capacity strengthening among younger generations. The resilience deficit in the rural landscapes is further entrenched by the deliberate lack of inclusive financial mechanisms that strive to support the collective resilience of whole villages and communities (Yuheng, 2022). The current state-driven Village Business Units (VBUs) are a typical example of the classic top-down approach where the government instructs service providers to go and drill a borehole, solarise it for micro irrigation serving the whole village within an average one-hectare plot that has to accommodate over a mean number of at least 100 households within a five to 10-kilometre radius.

Institutions strongly influence climate change adaptation by mediating between collective and individual responses and serving as conduits for resource access (Agrawal, 2008, in Vogel *et al.*, 2010). Their evolving rules and norms shape

adaptive governance frameworks that enable communities to manage resources and respond to challenges (Ostrom, 1990, in Vogel *et al.*, 2010). In drought contexts, enabling institutions provide funding, knowledge and networks, while disabling ones impose bureaucratic barriers that hinder innovation and exacerbate vulnerabilities (Mavhura, 2020). Effective resilience requires adaptive governance that is flexible, inclusive and forward-looking, with community participation fostering ownership and contextually relevant strategies (Manyena, 2020). Integrating traditional ecological knowledge with scientific approaches strengthens adaptive governance and promotes culturally sensitive practices (Mavhura and Mapuva, 2021). Ultimately, institutional design, stakeholder engagement and diverse knowledge sources are critical for anticipating risks, fostering collaboration and building sustainable adaptive capacity.

The effectiveness of adaptation strategies depends on overcoming institutional and structural constraints that hinder implementation and scalability. In Bikita District, barriers such as limited access to drought-resistant seeds, weak government support and financial constraints undermine drought mitigation (Muzawazi, 2016). Heavy reliance on maize, highly vulnerable to rainfall variability, further exposes communities to risk. Rigid governance structures, rooted in historical legacies of reactive drought responses, often prioritise short-term relief over proactive resilience-building (Vogel *et al.*, 2010). A one-size-fits-all approach is inadequate; instead, diverse institutions—from government agencies to grassroots organisations—must enable innovation and context-specific solutions. By providing structured processes for feedback and adaptation, institutions can foster strategies tailored to local circumstances and enhance resilience (Sibiya *et al.*, 2022).

Additionally, one can argue, advanced technologies and data analytics can boost local communities' ability to anticipate and respond to droughts. Remote sensing, big data, predictive modelling and real-time monitoring improve decision-making and are tools that can enhance understanding of hydrological cycles, optimise water allocation and reduce wastage. Combining traditional knowledge with modern innovations creates a resilient framework for climate variability, ensuring food and water security during prolonged droughts.

Resilience in Masvingo is not only shaped by material resources and institutional frameworks, but also by the emotional and cultural dimensions embedded within community life. Cultural practices such as collective farming, traditional ceremonies (such as *humwe* or *nhimbe*) and kinship-based support systems foster solidarity and a sense of shared identity, which strengthen adaptive capacities during drought crises. These practices provide emotional reassurance, reinforce trust and sustain social cohesion, enabling households to mobilise collective action even in the face of resource scarcity. Community identities rooted in ancestral ties and indigenous knowledge systems also serve as reservoirs of adaptive strategies, legitimising local coping mechanisms and enhancing their acceptance. By weaving together cultural traditions with contemporary resilience practices, communities in Masvingo demonstrate that adaptation is not merely technical, but deeply social, emotional and cultural, anchored in values that sustain collective agency and long-term survival.

CONCLUSION AND RECOMMENDATIONS

In conclusion, bridging the resilience deficit in Masvingo and similar contexts requires a fundamental re-orientation. It is imperative to reconfigure governance towards a synergistic framework that empowers community-led pathways and models, while prioritising the integration of scientific knowledge with local wisdom. Resilience can be achieved through policy mainstreaming actions, such as integrating small grains and indigenous water harvesting into national policies. Resilience building is an ongoing process that requires the co-production of knowledge, achieved by creating platforms where seasonal forecasts are interpreted through the integration of scientific insights and indigenous wisdom. Establishing participatory fora, community radio or Information Communication Technology platforms, farmer field schools and local knowledge hubs where scientific forecasts are jointly interpreted with indigenous indicators, ensuring inclusive governance and community ownership, would be ideal.. Strengthening local institutions will fill up the resilience deficit by empowering village committees and traditional leadership to manage resources with sustainable financial support systems. Practical targets and indicators for local authorities and development practitioners should thus centre around: i) Crop Diversification Rate – Percentage of households cultivating drought-tolerant small grains alongside maize; ii) Water Harvesting Infrastructure – Number of functional community-managed dams, wells, or

weirs maintained annually; iii) Community Participation – Proportion of households engaged in local resilience platforms (for example, village assemblies, scenario planning forums); and iv) Livelihood Diversification Index – Share of household income derived from non-agricultural sources (crafts, petty trade, tourism-linked activities) during drought years. The relationship between drought resilience and community well-being is an emerging area of study that can highlight the importance of exploring the connection between resilience to disasters, community health and life expectancy.

The Great Zimbabwe Resilience Pathways Framework (GZRPF), aligned with Education 5.0, places communities at the centre of designing context-specific resilience strategies. It translates research findings into a practical tool for use by government, NGOs, local leaders and practitioners. Rooted in principles of contextualisation, co-creation, catalytic synergy and connectivity, the framework advocates scaling community-led initiatives rather than imposing external solutions. It calls for a shift in roles—communities as experts, NGOs as facilitators and government as enablers. Presented as a guiding compass, not a blueprint, the GZRPF outlines a phased approach: short-term institutionalisation of community platforms; medium-term scaling of drought-tolerant crops, water harvesting and livelihood diversification; and long-term integration into policy, land tenure reform and gender-inclusive governance aligned with climate and SDG goals.

REFERENCES

- Agrawal, A. (2008). *The Role of Local Institutions in Adaptation to Climate Change*, World Bank Publications-Reports 28274, The World Bank Group.
- Araja, D. (2022). Resilience and Complex Adaptive Systems: A Perspective on Healthcare. *Journal of Business Management*, 20(1):1-16. <https://doi.org/10.32025/JBM22006>
- Bentley, C. and Anandhi, A. (2020). Representing Driver-Response Complexity in Ecosystems Using an Improved Conceptual Model. *Ecological Modelling*. 437. 109320. 10.1016/j.ecolmodel.2020.109320.
- Berkes, F. and H. Ross. (2013). Community Resilience: toward an Integrated Approach. *Society and Natural Resources* 26(1):5-20. <http://dx.doi.org/10.1080/08941920.2012.736605>

- Biggs, R., Schlüter, M. and Schoon, M.L. (Eds). (2015). *Principles for Building Resilience: Sustaining Ecosystem Services in Socio-Ecological Systems*. Cambridge, UK: Cambridge University Press, <http://dx.doi.org/10.1017/cbo9781316014240>
- Coetzee, C., Van Niekerk, D. and Raju, E. (2016), Disaster Resilience and Complex Adaptive Systems Theory. *Disaster Prevention and Management*, 25-(2), 196-211. <https://dx.doi.org/10.1108/DPM-07-2015-0153>
- Crossman, N.D. (2018). Drought Resilience, Adaptation and Management Policy (DRAMP) Framework. Fullerton: Southern Australia.
- Davidson, J.L.*et al.* (2016). Interrogating resilience: toward a Typology to Improve its Operationalisation. *Ecology and Society*, 21(2):27. <http://dx.doi.org/10.5751/ES-08450-210227>
- Derakhshan, M. and Singh, D. (2011). Integration of Information Literacy into the Curriculum: A Meta-Synthesis. *Library Review*, 60(3), 218-229
- Frischen, J. *et al.* (2020). Drought Risk to Agricultural Systems in Zimbabwe: A Spatial Analysis of Hazard, Exposure and Vulnerability. *Sustainability* 12(3):2-24 DOI: 10.3390/su12030752
- Folke, C. *et al.* (2010). Resilience Thinking: Integrating Resilience, Adaptability and Transformability. *Ecology and Society*, 15(4):18-20. [online] URL: <http://www.ecologyandsociety.org/vol15/iss4/art20/>
- Folke, C. (2016). Resilience (Republished). *Ecology and Society* 21(4), 44. <https://doi.org/10.5751/ES-09088-210444>
- Kamakaula, Y. *et al.* (2025). A Review of the Resilience of Rural Communities in the Face of Climate Change. *Journal of Innovative and Creativity (Joecy)*. 5.(2) 22979-22992. 10.31004/joecy.v5i2.3332.
- Lombe, P., Carvalho, E. and Rosa-Santos, P. (2024). Drought Dynamics in Sub-Saharan Africa: Impacts and Adaptation Strategies. *Sustainability*, 16(22), Article 9902. <https://doi.org/10.3390/su16229902>
- Magis, K. (2010). Community Resilience: An Indicator of Social Sustainability. *Society and Natural Resources* 23(5):401-416. <http://dx.doi.org/10.1080/08941920903305674>
- Makondo, C. (2018). Climate Change Adaptation: Linking Indigenous Knowledge with Western Science for Effective Adaptation. *Environmental Science and Policy*, 88, 83-91.

- Manyena, S. B. (2020). Disaster Risk Reduction and Resilience in Zimbabwe: A Critical Review. In: Leal Filho, W. (ed.), *Handbook of Climate Change Management*, 1-22. WHERE PUBLISHED: Springer.
- Maskrey, A. (2011). Revisiting Community-Based Disaster Risk Management. *Environmental Hazards*, 10, 42-52. <http://dx.doi.org/10.3763/ehaz.2011.0005>
- Matlala, L.S. (2025). Barriers to the Institutionalisation of Outcome-Based Approaches in South Africa's Public Sector. *Africa's Public Service Delivery and Performance Review* 13(1), 1-12. <https://doi.org/10.4102/apsdpr.v13i1.939>
- Matsa, M. (2020). *Sustainability in Minority Farming Communities*. WHERE PUBLISHED: Springer Nature. <https://doi.org/10.1007/978-3-030-51346-7>
- Matson, P., Clark, W. C. and Andersson, K. (2016). *Pursuing Sustainability: A Guide to the Science and Practice*. Princeton, New Jersey, USA: Princeton University Press.
- Mavhura, E., Manyena, S. B. and Manatsa, D. (2013). Droughts and Drought Scorching in Zimbabwe: Hazards and Management Options. In: Boulter, S. *et al.*(eds.), *Natural Disasters and Adaptation to Climate Change*, 95-104. WHERE PUBLISHED?????: Cambridge University Press.
- Mavhura, E. (2020). Learning from the Tropical Cyclones that Ravaged Zimbabwe: Policy Implications for Effective Disaster Preparedness. *Natural Hazards: Journal of the International Society for the Prevention and Mitigation of Natural Hazards*, 104(3), 2261-2275.
- Mavhura, E., and Mapuva, J. (2021). Barriers for Local Authorities to Invest in Disaster Risk Reduction: Evidence from Zimbabwe. *South African Geographical Journal*, 104. 1-15. [10.1080/03736245.2021.1934092](https://doi.org/10.1080/03736245.2021.1934092).
- Maxwell, S. (1996). Food Security: A Post-Modern Perspective. *Food Policy*, 21, 155-170. [http://dx.doi.org/10.1016/0306-9192\(95\)00074-7](http://dx.doi.org/10.1016/0306-9192(95)00074-7)
- Mpala, T.A. and Simatele, M.D. (2024). Climate-Smart Agricultural Practices among Rural Farmers in Masvingo District of Zimbabwe: Perspectives on the Mitigation Strategies to Drought and Water Scarcity for Improved Crop Production. *Front. Sustain. Food Syst.* 7:1298908. DOI: [10.3389/fsufs.2023.1298908](https://doi.org/10.3389/fsufs.2023.1298908)

- Mugambiwa, S. S. (2018). Adaptation Measures to Sustain Indigenous Practices and the Use of Indigenous Knowledge Systems to Adapt to Climate Change in Mutoko Rural District of Zimbabwe. *Jamba: Journal of Disaster Risk Studies*, 10(1), 1-9 <https://doi.org/10.4102/jamba.v10i1.388>
- Muguti, T. and Maposa, S.R. (2012). Indigenous Weather Forecasting: A Phenomenological Study Engaging the Shona of Zimbabwe. *Journal of Pan African Studies*, 4, 102-112. http://www.jpanafrican.com/archive_issues/vol4no9.htm
- Muzawazi, D. (2016). The Impact of Community/Nutrition Gardens as a Strategy for Coping with Drought and Climate Change: The Case of Rural Farmers in Bikita District Masvingo, Zimbabwe. MSc Dissertation, University of Pretoria, Pretoria, viewed <http://hdl.handle.net/2263/53538>.
- Ndhlovu, T. (2022). *Natural Hazards Governance in Zimbabwe*, Online Publication <https://doi.org/10.1093/acrefore/9780199389407.013.445>
- Nyahunda, L., Tirivangasi, H. M., and Mabila, T. E. (2022). Challenges Faced by Humanitarian Organisations in Rendering Services in the Aftermath of Cyclone Idai in Chimanimani, Zimbabwe. *Cogent Social Sciences*, 8(1). Article 2030451. <https://doi.org/10.1080/23311886.2022.2030451>
- Olsson, P., Folke, C. and Berkes, F. (2004). Adaptive Co-Management for Building Resilience in Social-Ecological Systems. *Environmental Management* 34(1):75-90. <http://dx.doi.org/10.1007/s00267-003-0101-7>.
- Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Actions*. New York, New York, USA: Cambridge University Press. <http://dx.doi.org/10.1017/CBO9780511807763>
- Sibiya, N. *et al.* (2022). Empowering the Voiceless: Securing the Participation of Marginalised Groups in Climate Change Governance in South Africa. *Sustainability*, 14(12), Article 7111. <https://doi.org/10.3390/su14127111>
- Tanner, T. *et.al.* (2015). Livelihood Resilience in the Face of Climate Change. *Nature Climate Change*. 5(1) 23-26. 10.1038/NCLIMATE2431.
- Timulak, L. (2009). Meta-Analysis of Qualitative Studies: A Tool for Reviewing Qualitative Research Findings in Psychotherapy. *Psychotherapy Research*, 19(4-5), 591–600. <https://doi.org/10.1080/10503300802477989>

- Tsegaye A.T *et.al.* (2018). Reducing Amount and Frequency of Meals as a Major Coping Strategy for Food Insecurity. *Archives of Public Health*, 76, Article 56. DOI: 10.1186/s13690-018-0303-3. PMID: 30305899; PMCID: PMC6171242.
- United Nations World Food Programme (2016). El Niño: Undermining Resilience in Southern Africa. <https://www.wfp.org/publications/el-nino-undermining-resilience-southern-africa>
- Vogel, C., Koch, I. and Zyl, K. (2010). “A Persistent Truth”—Reflections on Drought Risk Management in Southern Africa. *Weather, Climate and Society*, 2. 10.1175/2009WCAS1017.1.
- Yuheng, L. (2022). A Systematic Review of Rural Resilience. *China Agricultural Economic Review*, 15(4), 677-695. 10.1108/CAER-03-2022-0048