

**Towards the development of a Strategic Sustainable Resilience Building Framework for Southern Zimbabwe.**

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### **Abstract**

Resilience building concept has increasingly been embraced as a framework for disaster resilience and as result policies are being initiated which support resilient community programmes. Climate change adversities have intensified community vulnerability to hazards and undermined households' capacities to withstand disasters sustainably. Building community climate resilience has presented various challenges and opportunities to the exposed communities. This study seeks to analyze the challenges and opportunities obtained when building community resilience in communal areas of Mwenezi District. The initiatives were implemented through the Enhancing Community Resilience and Sustainability Project (ECRAS) led by CARE and PLAN International targeting to increase communities' capacities to withstand shocks and stressors and also enhance livelihood options. A mixed method approach which utilized both qualitative and quantitative techniques was used. The choice of two approaches was based on a phenomenological constructivist belief that problems are best solved using multiple sources. The qualitative approach depended on questionnaires, interviews, focus group discussions and direct field observations. The quantitative approach depended on closed ended questions and use of statistical package for social scientists (SPSS version 25.0) for data analysis. The research established several challenges being obtained when building community climate resilience. Some of the challenges included ignorance, lack of technical know-how and lack of financial resources to buy resilient inputs on the side of communities. To the implementing partners it was established that resistance and shortage of resources are some of the challenges being encountered. Building climate resilience has enhanced dietary diversity of exposed communities, food security status, income generation and livestock production. Therefore building climate resilience is a critical strategy for substantially managing climate change adversities and as such the Strategic Sustainable Resilience Framework developed is

expected to foster successful implementation of resilience interventions through managing challenges obtained. The study recommends continued implementation of more climate resilience strategies to improve livelihoods of at risk communities.

**Key words:** Challenges, opportunities, climate resilience, communal areas, Mwenezi District

## **1. Introduction**

Community resilience or the sustained ability of a community to withstand and recover from adversities has become a key policy issue which is being embraced at state and local levels (Scholl and Carnes 2017). This is enabled by both the physical and social infrastructure in the build environment to facilitate the ability to bounce back stronger than before. The importance of building community resilience has become increasingly recognized by locals, stakeholders and country governments in emergency management and post-disaster community well-being (Miles 2015; Davis et al. 2018). Resilience is being initiated so as to allow communities to be able to reduce long recovery periods after an emergency. As disasters may cause extreme damage and long-lasting disruptions in community functioning, it is vital for community stakeholders to envision potential damages and expected recovery processes (Turoff et al. 2016; Rubim and Borges 2017). Community resilience planning requires community decision-makers, environment experts and local stakeholders to identify social goals and their dependencies. This collaboration and communication among experts in different and non-experts makes community resilience planning more challenging due to involving human factors in the planning process (Scholl and Carnes 2017).

Community resilience entails the ongoing and developing capacity of the community to account for its vulnerabilities and develop capabilities that aid that community in preventing, withstanding, and mitigating the stress of a disaster (Miles et al. 2018). Resilience building fosters recovering in a way that restores the community to a state of self-sufficiency and at least the same level of strength and social functioning after a disaster. In order to build community resilience, a community must develop capabilities in the following areas: active engagement of community stakeholders in disaster event planning and personal preparedness and development of social networks (Ramachandran et al. 2015; Cutter et al. 2016).

Communities are increasingly facing complex challenges. Human induced and natural disasters are becoming more frequent and costly (Davis et al. 2018). Factors like climate change, globalization and increased urbanization are bringing disaster related risks to greater numbers of people. Developing community resilience benefits disaster planners and community members alike. Community resilience expands the traditional preparedness approach by encouraging actions that build preparedness while also promoting strong community systems and addressing the many factors that contribute to health (Rubim and Borges 2017). As a result, resilience building is presenting opportunities in many communities through, promoting health and wellness alongside disaster preparedness, expand communication and collaboration, engaging at-risk individuals and the programs that serve them and building social connectedness (Miles and Chang, 2011; Scholl and Carnes, 2017).

Though several opportunities are being obtained from resilience building, there are challenges which are associated with the resilience process. This is because; community resilience is complicated and multi-dimensional on its own (Davis et al. 2018). Community resilience planning in practice is a highly collaborative process that involves numerous stakeholders associated with human oriented challenges. Resilience planning is technical and domain oriented and requires a comprehensive understanding of the recovery process of damaged entities in the built environment and social systems (Longman and Miles, 2019). In addition to being a complex puzzle community planning is a highly user-centered process, requiring collaboration among built environment experts with different areas of expertise, communication among experts of the built environment and social institutions, and information sharing among the planning participants, community stakeholders, governmental and elected officials, and community members (Miles, 2015; Longman and Miles, 2019). It is essential to recognize and understand the complexity of the planning process and its characteristics.

Zimbabwe has experienced a number of unprecedented economic, environmental and political shocks and stressors many of which had long lasting impacts (Ganji et al. 2017; Sagara, 2018). Poverty, food insecurity, malnutrition and environmental degradation had serious challenges on rural areas. As a result, the concept of resilience has emerged as a plausible framework for improving community capacities to withstand shocks and stressors. Resilience building contributed significantly to strengthen the ability of vulnerable populations to adapt to change,

improve their well-being and contribute to and benefit from social development and economic growth in Zimbabwe (Zselecky and Yosef 2014; Carletto et al 2014; Seneviratne, 2018). However, there are challenges being obtained when implementing resilience initiatives in communities. Some of the challenges identified include failure of peer to peer climate smart support platforms, failure to access resilient inputs, failure to purchase resilient infrastructure and that resilience building requires collaboration of experts with different expertise (Sagara, 2018). Therefore, it is against this background that this study seeks to assess the challenges and opportunities of building community resilience in communal areas of Zimbabwe. The study shall develop a Strategic Sustainable Resilience Framework to manage challenges of building resilience and promote successful sustainable implementation of resilience building initiatives.

### **Justification of the study**

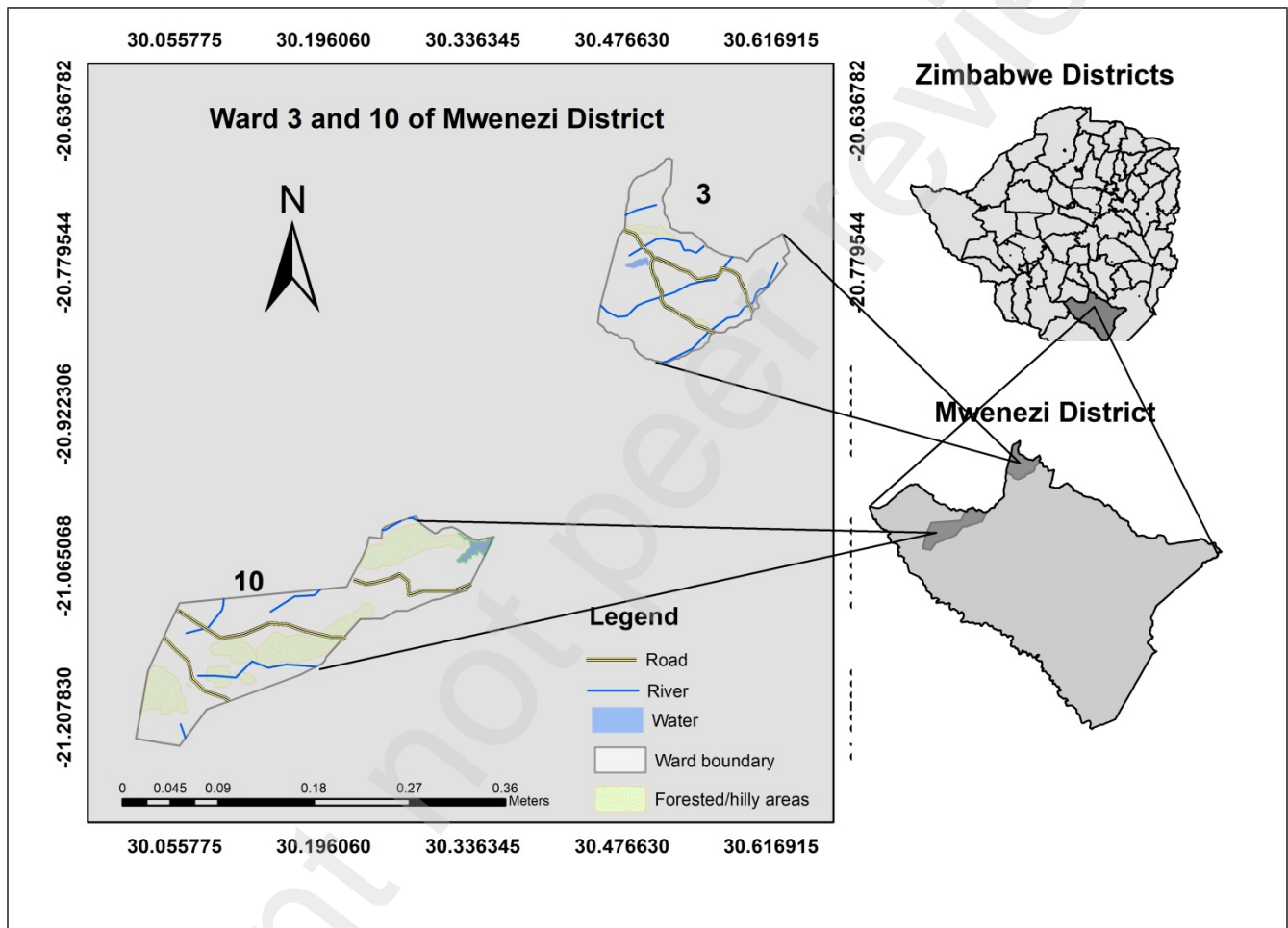
Resilience building is an important subject targeting to minimize the severity of shocks and stressors. Successfully built resilient individuals, households and communities will become able to cushion, adapt and move on from the effects of shocks and stressors (Bahadur et al 2016; Brown, 2016; Bond 2017). Therefore, this study on assessing the challenges and opportunities of building community resilience is of fundamental importance as it shall facilitate modification and implementation of more initiatives that support sustainable transformation of livelihoods through development of a Strategic Sustainable Resilient Framework.

Building community resilience has presented opportunities to help communities alleviate poverty and enhance livelihood capacities to withstand prevailing and recurrent shocks and stressors. According to the UNDP (2019) report, poverty is negatively impacting communities' ability to withstand shocks, stressors and it is enhancing communities' exposure to hazards. As a result, initiating interventions that help alleviate poverty is critical for enhancing communities' ability to manage shocks and stressors. The envisaged Strategic Sustainable Resilient Framework shall promote successful implementation of resilience building interventions through presenting solutions for managing challenges obtained when implementing resilience interventions.

The importance of this study will also be realized by various organizations/ stakeholders who are collaborating to develop innovative tools targeting to manage climate change induced shocks and

stressors. This is so because building resilience is a multi-stakeholder project whereby many stakeholders collaborate to offer response pathways to communities. Therefore assessing challenges obtained when building resilience will help the relevant stakeholders to modify and perfect the approaches implemented to overcome shocks and stressors.

### Study area map



**Figure 1 Map of Mwenezi District ward 3 and 10**

### Description of study area

Mwenezi District is in Masvingo Province and is situated in the Southern part of Zimbabwe. It is in agro-ecological region V (a) which is characterized by high temperatures and low erratic rains ranging between 450-650mm (ZINGSA, 2020). The average annual highest temperature in Mwenezi is 36.7°C and the average annual lowest temperature is 9.8°C. The district has a total land area of 1 339 657 hectares made up of communal areas, intensive conservation areas for

wildlife and old resettlement areas (Chikodzi et al. 2013). The most common tree species are marula (*scherocaya birrea*), baobab (*adansonia digitata*), and Mopane (*colophospermum mopane*) (Mamombe, 2017). Mwenezi District is characterized by flat and undulating area around 300metres altitude (Mando, Dziva and Zhou 2019).

Cereal crop production yields are generally low, averaging 0.5t/ha against the average yield potential of 2.8t/ha for agro-ecological region V. Recurrent droughts in Mwenezi District have caused an increase in food insecurity, malnutrition and environmental degradation (UNDP, 2019). Low yields in Mwenezi District have necessitated collaboration of different stakeholders to design and implement resilience building interventions components to improve agriculture production and managing climate change impacts.

Livelihoods of the poor majority are largely dependent on climate sensitive areas such as agriculture, livestock production and forestry resources for household energy, food security and water supply (Tembo, 2017; Muchacha and Mushunje, 2019; Matsa, 2021). Diarrhea cases have been reported in Mwenezi District due to poor hygiene and sanitation. Mwenezi District is divided into 18 wards and all the wards add up to, 97013 males and 112 314 females (ZIMSTAT, 2022).

## **Methodology**

The research was conducted guided by a pragmatist research philosophy. Pragmatist research philosophy determines undertaking researches guided by innovative ways that can develop solutions to problems under investigation (Pandey, 2015). Pragmatist philosophical assumptions prompted the researcher to adopt a mixed method approach. The researchers realized that the envisaged Strategic Sustainable Resilience Framework can be best developed through a mixed method approach. Mixed approach employs both qualitative and quantitative paradigms in the same study to test reliability and validity of results and is used to collect information concerning the present situation of the phenomena (Lenth, 2009; Walsh, 2019). This design was chosen because it entails acquiring data that explains events, organizing, tabulating, depicting, and describing the data acquired, and frequently employs visuals such as graphs and charts (Prasad, 2021). The qualitative paradigm used depended on interviews, focus group discussions,

observations and open ended questions. Quantitative paradigm depends on closed ended questions, use of SPSS version 25.0 to analyze descriptive statistics.

The research targeted 2029 households in ward 3 and 2164 in ward 10 of Mwenzi District (ZIMSTAT, 2022). According to the Enhancing Community Resilience and Sustainability Report of 2020, ward 3 and 10 are the most significant participants of resilience building interventions and as a result these wards were considered for this study to obtain data on the challenges and opportunities of building community resilience. The research targeted stakeholders operating in the district on enhancing climate resilience to reduce extreme hunger and poverty amongst vulnerable communities which are namely; District Social Services (DSW), District Development Coordinator (DDC), NGOs (PLAN, CARE, ICRISAT), Rural District Council (RDC), Agriculture Technical and Extension Services and Veterinary services. These were targeted as key informants for interviews.

The researchers adopted purposive sampling technique to select 2 wards namely wards 3 and 10. Purposive sampling was used to select ward 10 as a study area. Purposive sampling was used because it is the most time effective sampling technique in which the researcher relies on his judgement when choosing members of the population to participate in the study (Black, 2010). Ward 3 has 2029 households and ward 10 has 2164 households (ZIMSTAT, 2022). A 10% sampling frame was used to calculate the total number of respondents from the 2 selected wards. Using the 10% sample frame, 202 respondents were selected from ward 3 and 216 from ward 10. Adoption of a 10% sampling frame was based on Fowler (2019) who postulated that, a 10% sampling frame provide a workable sample and reliable results as it ensures total representation of the population.

Quantitative data analysis provided meaning for data collected using closed-ended questionnaires. Data was cleaned, coded and fed into SPSS version 25.0 for analysis. Descriptive statistics obtained were presented on graphs and charts for easy interpretation by end users. Qualitative data obtained from open-ended questionnaires, interviews and focus group discussion narratives was subjected to content analysis whereby emerging themes, patterns and relationships were identified. Coding of responses presented by people in different contexts helped to develop more meaningful data to end users. Qualitative results were presented to enhance quantitative data. This is because presenting both types of data brought out the best through lessening



ambiguity of quantitative data statistics and provided greater meaning of the data obtained (Weissgerber et al. 2015). A collective analysis of results was done to develop a Strategic Sustainable Resilience Framework to be adopted to manage the challenges of building community resilience in communal areas.

## **Results and discussions**

The findings section focused on challenges and opportunities of building community resilience in Mwenezi District. Mwenezi District is a semi-arid district which requires various efforts to enhance communities' capacities to withstand disasters induced by aridity conditions. The study assessed the challenges faced by implementing agencies as well by the communities.

### **Implementation of resilience building initiatives**

In Mwenezi District stakeholders collaborated and initiated response pathways to enhance community resilience. Non-Governmental Organizations (NGOs) and Government departments facilitated development of resilient interventions. In this study, Government departments mentioned by respondents who were active in building community resilience are namely; Department of Agriculture Technical and Extension Services (AGRITEX), Department of Veterinary services, Mwenezi Rural District Council (MRDC), Ministry of Health and NGOs mentioned included; PLAN International, CARE and ICRISAT. Collaboration of stakeholders to build community resilience has been supported by Ben et al. (2015) who articulated that to enhance disaster resilience, overcome hunger achieve food security in the face of challenges require integration and mutual collaboration of government departments and NGOs to develop innovative tools and strategies for disaster risk reduction.

The stakeholders engaged implemented various interventions to capacitate communities to withstand shocks and stressors. The interventions initiated can be broadly categorized as; crop based interventions; livestock production interventions, off-farm human development interventions.

### **(a) Crop based interventions**

Crop production was mentioned by the AGRITEX officer as one of the livelihood options. The AGRITEX officer explained that some of the livelihoods in Mwenezi depend on crop production to sustain their lives. They obtain food and income from farm produce sales. However 63% of the selected respondents articulated that crop production is no longer viable due to climate change adversities. Late rainfall onsets and insufficient rains, high temperatures were mentioned as climate attribute significantly challenging crop production in Mwenezi. This was also supported by the District AGRITEX officer who reported that, for the previous season 2020/2021. Late rainfall onset delayed the planting time. People received the first rains in December and the Extension Officer for ward 3 reported that by mid-January 47% of farmers had not planted

#### **1. Small grain production scheme**

CARE International in Mwenezi District promoted small grains production scheme. The scheme was initiated targeting to manage rainfall variability and high temperatures which had reduced crop production significantly. The department of AGRITEX supported the small grains production scheme through continuous monitoring and setting of demonstration small grain plots. The District Head highlighted that promotion of small grains production was an initiative to manage the effects of low and erratic rains and high temperatures. Small grains were identified as suitable for withstanding low moisture and high temperature conditions. The sampled respondents highlighted that, for the previous season they have received small grains inputs from the government under the Presidential input scheme. Some of the small grains being planted by farmers include; white sorghum (*sorghum bicolor*), pearl millet (*pennisetum glaucum*), rapoko and red sorghum.

#### **2. Nutrition gardens**

In Mwenezi District, CARE International facilitated construction of nutritional gardens. On the established gardens, boreholes were rehabilitated and installed the solar system. The solar system intervention improved water uptake from the sub-surface to supplement crops during moisture deficit times. The Rural District Council Chief Executive Officer highlighted that 17 solar

powered boreholes were set in Mwenezi on 17 community gardens. Plate 1 present one of the established solar powered community garden



Plate 1 Established community garden with a solar system

Vegetable production was enhanced due to constant availability of water and some of the vegetables grown include: Cabbage (*brassica oleracea var capitata*), covo (*brassica oleracea var acephala*), rape (*Brassica napus*), carrots (*daucas carota*), spinach (*spinacia oleracea*), onions (*allium cepa*), tomatoes (*lycopersican esculentum*) and *muboora*. Hence the installation of solar systems improved agriculture production.

### **(b) Livestock production interventions**

Mwenezi District is in agro-ecological region V which experiences semi-arid to arid conditions. As a result livestock production is the most suitable livelihood activity. However climate change impacts of rainfall variability and high temperatures have contributed to pasture shortage and safe water drinking unavailability. The Enhancing Community Resilience and Sustainability (ECRAS) Project initiated livestock production interventions. The interventions initiated, for example, fodder production and preservation ensured availability of livestock feed. The District Veterinary Officer explained that livestock production improved cattle quality and increased farmers' chances to sell their beasts to reputable buyers for higher prices.

A total of 61% of the respondents articulated that they generate their income through the livestock production sector. As a result interventions that improved cattle quality also improved welfare of people. Income generated from livestock sales was used for building better houses made of modern materials, improved toilet facilities and clean water sources that reduced spread of diseases related to poor hygiene and sanitation.

### 1. Livestock housing structures

The District Veterinary Officer highlighted that people in Mwenezi District used to own large herds of livestock that is goats, cattle and chickens. A total of 65% of the respondents mentioned that they have lost their livestock to diseases. The selected respondents highlighted that cattle were affected by foot and mouth disease, anthrax; goats were mainly affected by *chibhubhubhu*; chickens by infectious coryza. The Veterinary Officer explained that the diseases obtained in Mwenezi were due to poor housing structures. This explains why the stakeholders implemented the improved livestock housing scheme. In the selected wards, 44% constructed raised goat structures, 53% constructed three cross sectional kraals (Plate 2) and 61% constructed raised chicken structures. The improved livestock structures reduced disease outbreak and multiplication, for example, cross sectional kraals reduced foot rot for cattle, infectious coryza for chickens and foot rot also for chickens.



Plate 2 Three cross kraal



Plate 3 Raised goat structure

## **Challenges of building community resilience**

The researchers examined the challenges obtained when building community resilience. The findings obtained revealed that challenges are into 2 categories that is challenges faced by implementing agencies and challenges faced by communities.

### **1. Challenges faced by implementing agencies**

Stakeholders involved in building resilience lack resources to utilize during the implementation of interventions. The AGRITEX extension staff highlighted that some of their roles require them to be mobile. As a result, they require motor cycles to cross cut the wards of their jurisdiction. Some of the respondents mentioned that they own motorcycles but they do not have funds to fuel the motor cycles. This however caused significant challenges for AGRITEX staff to monitor the implemented crop production interventions.

More so, the District Veterinary Officer highlighted limited availability of livestock vaccination drugs. The Veterinary Officer explained that they are not able to fully vaccinate all livestock in the District. Two reasons were mentioned and these included lack of proper storage facilities for storing vaccines. The specialist articulated that, vaccines are kept in facilities with regulated temperature conditions.

The implementing agencies also highlighted that, they faced some resistance from the local communities. The communities were found not willing to change their ways of life to adopt new livelihood techniques which are climate smart and highly resistant to the prevailing climatic adversities. For example, research findings revealed that a considerable proportion of household which constituted about 42% are still planting maize. However they are not considering the fact that maize is less resistant to harsh climate changes being experienced. As a result communities must go for small grains which are highly resistant.

### **2. Challenges faced by the communities to build community resilience**

The research examined challenges faced by communities when building community resilience. Findings revealed that resilience building is a critical initiative; however communities are struggling to effectively adopt and implement mechanisms that allow them to withstand shocks and stressors. Some of the identified challenges include lack of capital (41%), lack of technical

advice (19%), lack of resilience building resources and infrastructure (38%), extreme climatic conditions (40%) (figure 2).

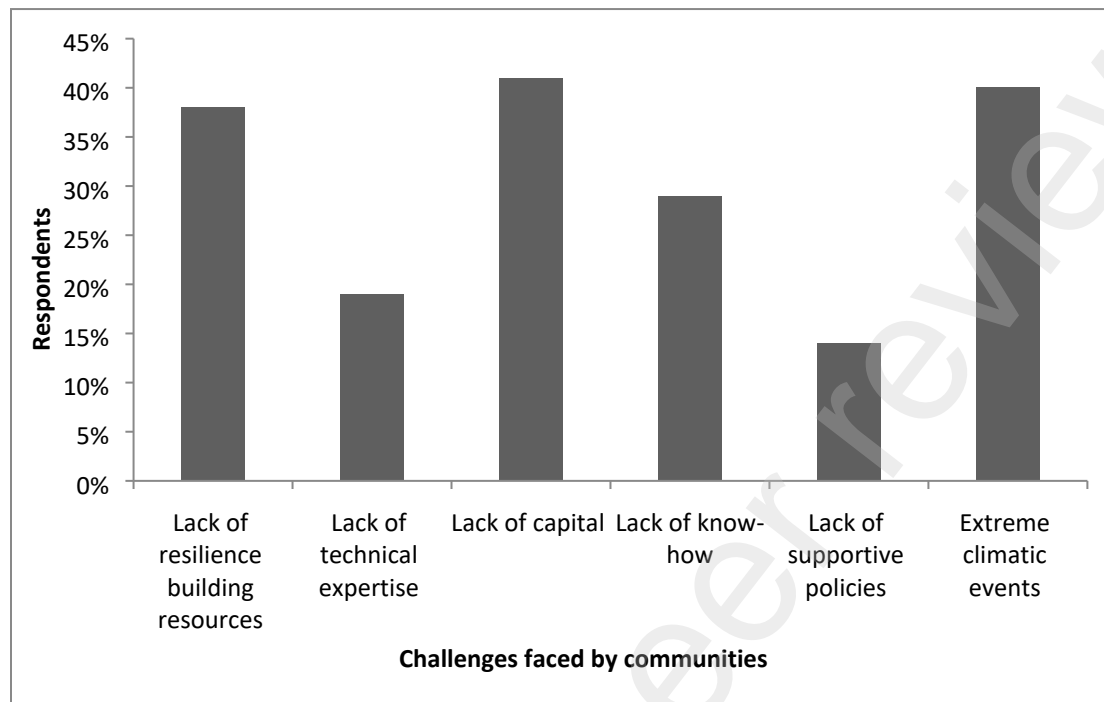


Figure 2 Challenges faced by communities to build community resilience

A total of 38% of the respondents explained that lack of resilience building resources and infrastructure is hindering the progress of building resilient households. Households explained that some interventions for example, construction of livestock structures require modern and expensive materials. The required capital to purchase materials is beyond the capacity of majority households to buy materials. Some (19%) of the respondents articulated that, they lack technical advice to build community resilience. The respondents explained that, they are not well covered by monitoring and supervision offered by extension workers. One of the respondents furthered that, the ward is too big and such one extension worker cannot move around the whole ward.

The Rural District Council officer highlighted the issue of extreme climatic events as another challenge faced by communities to build community resilience. The selected respondents highlighted that, they have attempted to adopt new seed varieties but however they are

continuing to dry before maturity due to high temperatures and even little rainfall to support plant growth.

The respondents were asked to rate the severity of the challenges being obtained when building community resilience. A proportion of 33% indicated that the challenges are moderately severe, 49% very severe, 14% said severe and 4% said they are not severe (figure 3). The proportion of respondents who articulated that challenges are very severe gave reasons such as failure to access resilience building inputs and lack of technical know-how. All these have exacerbated the failure of communities to effectively adapt to climate change impacts through innovative ways.

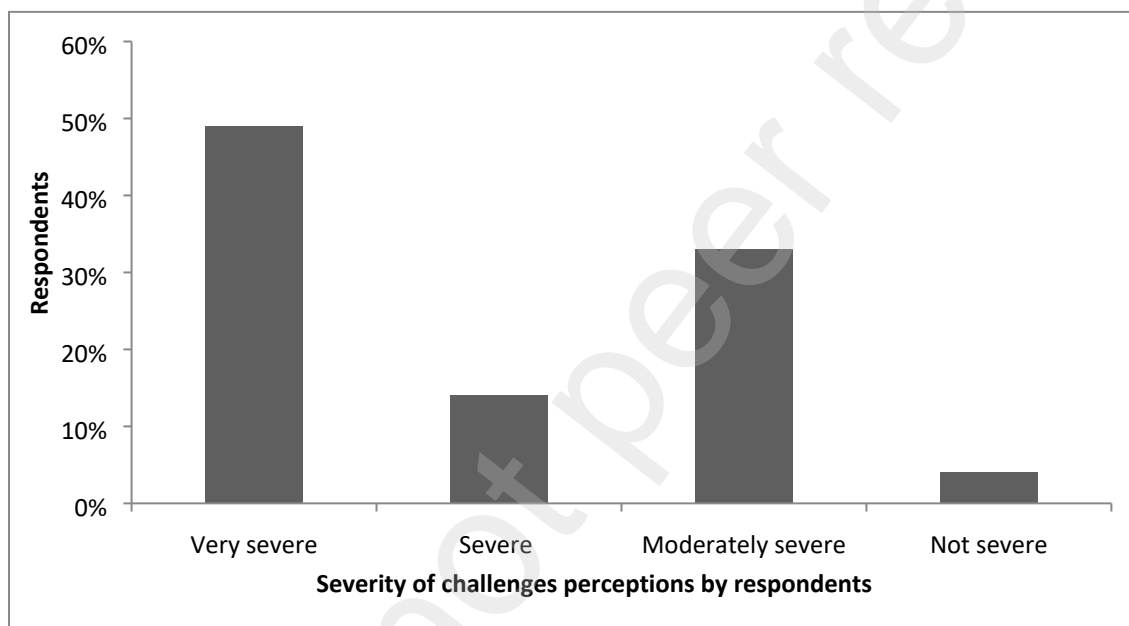


Figure 3 Severity of challenges as perceived by respondents

### **Opportunities of building community resilience**

Resilience building interventions that have been initiated in Mwenezi District have strengthened the ability of communities to withstand, cope and adapt shocks and stressors. Research findings revealed that household/ community well-being has significantly improved for example, food availability, income sources, improved housing facilities, access to education, community health and sanitation.

## Household food security status and dietary diversity

Resilience building interventions implemented in Mwenezi District through the ECRAS project enhanced the food security status of households. Some of the interventions, for example, adoption of small grains improved crop yields. The District AGRITEX head explained that adoption of small grains improved cereal crop production as small grains proved to be more resistant and can survive through harsh and extreme climate conditions of low rainfall and high temperatures unlike maize. Interventions such as the livestock production sector allowed purchasing of basic food stuffs. The implemented interventions promoted attainment of food security that is sustainable development goal 2 (Zero hunger). Food security status is measured on three main pillars namely, food availability, food accessibility and food utilization (FAO, 2013). As revealed by the findings adopted, interventions have contributed successfully to attain the afore-mentioned food security pillars (Figure 4).

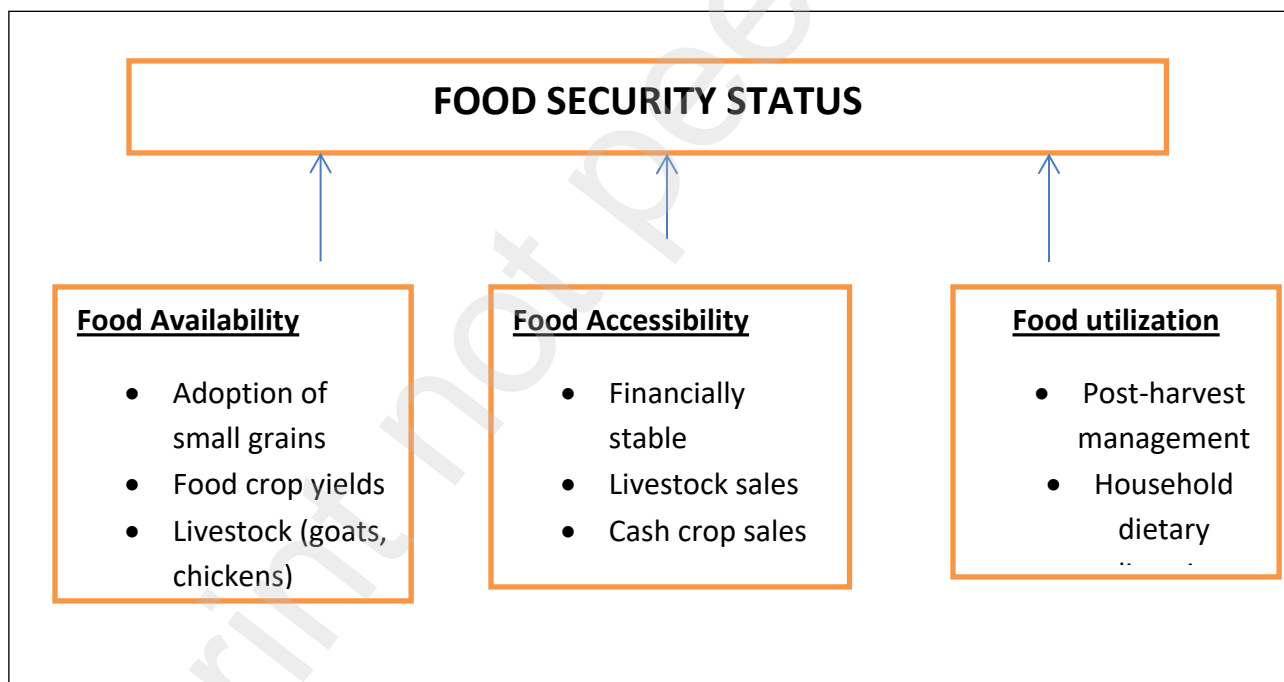


Figure 4 Food security pillars



## Household dietary diversity

Due to successful resilience building, household dietary diversity changed significantly. A wide range of food stuffs with different nutritious values were obtained. More so, the intervention on rehabilitation of community gardens enabled balancing of diet at household level. In community gardens established, various food crops with significant nutritious values were grown, for example, vegetables grown became an important source of vitamins; livestock products also provided essential nutrients. Of the selected respondents, research findings revealed that 3% mentioned that resilience building initiatives have lowly impacted their dietary diversity, 51% are have having goo dietary diversity and 46% have medium dietary diversity (Figure 5). The respondents explained that the changes brought on their diet made them be able to have a balanced diet. Hence resilience building initiatives have facilitated households the opportunity to have a balanced diet.

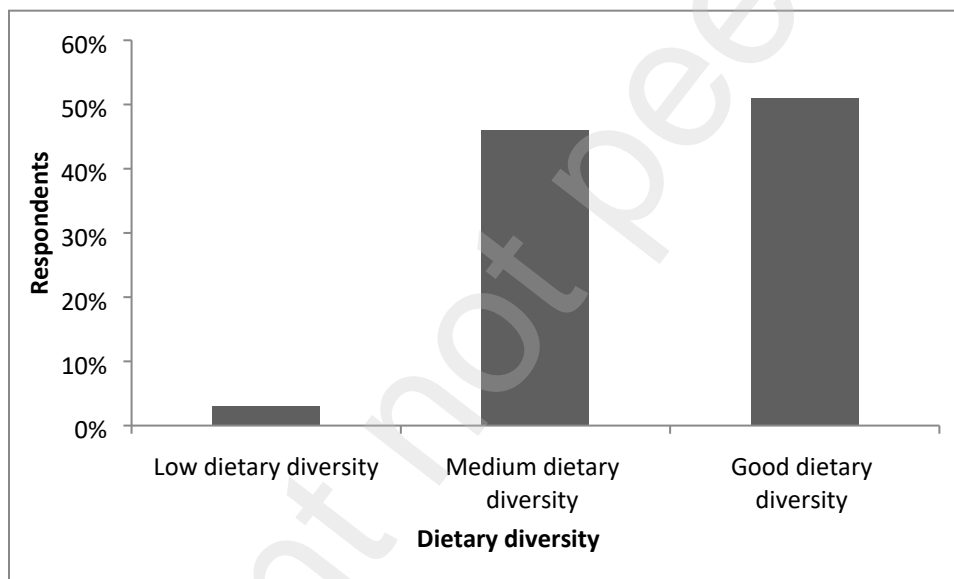


Figure 5 Dietary diversity

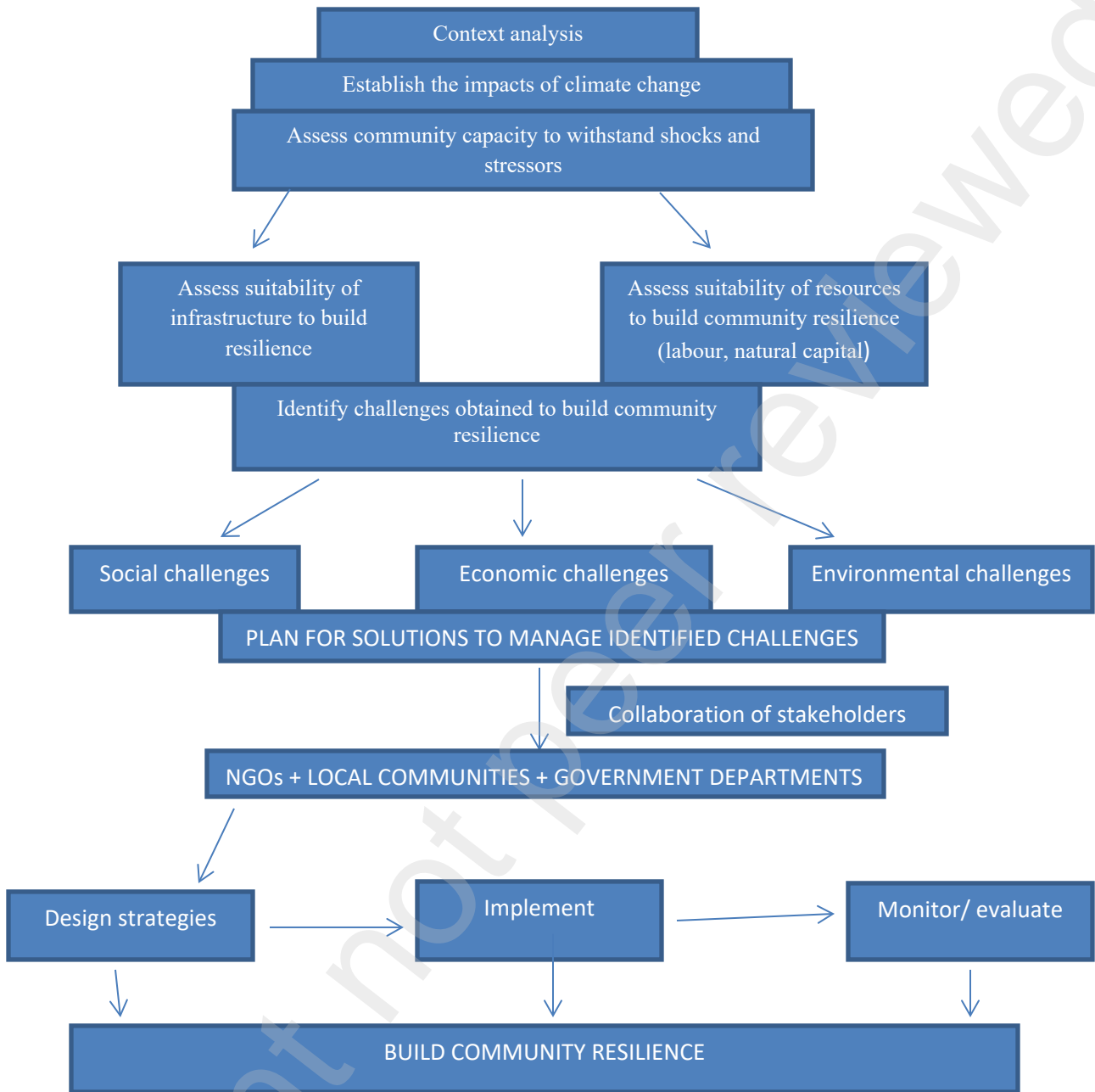
## Livelihood diversification

Successful implementation of resilience building interventions made livelihoods to be diversified at household and community levels. Livelihood of successful farmers became more diversified as they began to rely on many sources to sustain lives. They became dependent on various interventions such as livestock production, crop production, village savings and lendings,-they

also depend on remittances. However unsuccessful farmers depend on fragmented and uncoordinated traditional activities like beer brewing, basketry, carpentry and casual labour sale which contribute very little to resilience building.

### **Envisaged Strategic Sustainable Resilience Building Framework**

Strategic Sustainable Resilience Building Framework is a problem solving framework that has been developed by the researchers targeting to manage challenges obtained when building community resilience (Figure 6). The framework target to promote adaptation and successful implementation of resilience building interventions. The development of this framework was premised on the theoretical underpinnings that resilience building has been recognized as “the plausible framework cost effectively for substantially improving regional, local capacities to withstand shocks and stressors” (Kurial and Nyaggah, 2016; WFP, 2017). Therefore development of this framework will help promote uptake of resilience building strategies.



**Figure 6 Strategic Sustainable Resilience Building Framework**

## **Conclusion**

Climate change impacts have increased the vulnerability of communities to shocks and stressors. The climatic adversities being experienced such as high temperatures and low and erratic rains have undermined the livestock and crop production sectors. These have necessitated the initiation of sustainable resilience building initiatives. Though resilience building has been identified as a powerful weapon against climate change adversities, some challenges were revealed by the study that hinder successful implementation of interventions. The main challenges identified were categorized as; challenges faced by implementing agencies and challenges faced by communities. The implementation of resilience building presented opportunities for successfully enhancing community capacities to withstand shocks and stressors. Resilience building is an important tool that accelerates the rate of attaining sustainable development goals. The interventions, for example, adoption of small grains increased grain production; establishment of nutritious gardens increased vegetable production. All the interventions increase food availability and end extreme poverty. Collective analysis of results produced a Strategic Sustainable Resilience Building Framework developed to manage climate change impacts and foster implementation of resilience building initiatives.

## **Recommendations**

Resilience building interventions implemented integrating approaches by NGOs in partnership with Government Departments engaging communities yielded notable successes in the studied communities. In light of the identified challenges; the department of AGRITEX should offer extensive visits to farmers, disseminating information and conducting crop condition assessments. This will help manage the challenge of lack of technical advice to build community resilience. More so, the Government of Zimbabwe should assist with transport and fuel all Government departments operating in the district. This will capacitate them to offer extensive visits across the district to monitor crops and livestock condition. Policies should be initiated by the Government of Zimbabwe that offer opportunity of collaborating stakeholders to design and implement interventions that increase communities' capacities to withstand shocks and stressors.

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