

CASE STUDY



Building Community Resilience to Climate Shocks

Lessons from ENSURE in Zimbabwe

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World Vision is a Christian humanitarian organization dedicated to working with children, families, and their communities worldwide to reach their full potential by tackling the causes of poverty and injustice.

The goal of Enhancing Nutrition Stepping Up Resilience and Enterprise (ENSURE), a six-year World Vision-led consortium funded by USAID Food for Peace, is to build food security and resilience among rural communities in Zimbabwe. This includes improving the nutrition of women of reproductive age and children under the age of 5.

Executive Summary

Resilience strategies underpin the work of many international development agencies and governmental and non-governmental agencies working in complex, fragile environments. While there are numerous definitions of resilience, nearly all relate to the capacity of individuals, communities, households, and states or countries to sustain progress toward development goals despite repeated shocks and stresses.^a In general, these agencies have adopted a framework that depicts resilience as three interconnected capacities: absorptive coping capacity, adaptive capacity, and transformative capacity.

This paper also uses the above resilience framework to examine ENSURE's approach to building community resilience. It focuses on what ENSURE **did and what it left behind**¹ in enhancing the community's ability to reduce and mitigate shocks and stresses through **absorptive, adaptive, and transformative** capacity building for improved food security and livelihoods. The findings and lessons learned from this experience contribute to ongoing efforts by various stakeholders and development partners in Zimbabwe that are supporting and engaging in building community and household resilience in different capacities.

In Zimbabwe—as in many countries across Africa—building the resilience of rural livelihoods to climate-related shocks and weather extremes is critical for communities to achieve and sustain well-being. Since 2013, the Government of Zimbabwe and a World Vision-led consortium

^a USAID defines resilience as the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth.



have jointly implemented the USAID Food for Peace-funded Development Food Security Assistance (DFSA) Enhancing Nutrition Stepping Up Resilience and Enterprise (ENSURE) project, with the goal of building food security and resilience among rural communities in vulnerable areas of Zimbabwe.

ENSURE operates in semi-arid and arid areas prone to recurrent climate-related shocks that result in widespread losses of assets, crop failures, and severe food insecurity. In addressing these challenges, the ENSURE program is organized into three Strategic Objectives (SOs). SO1 focuses on enhancing nutrition; SO2 focuses on improving household incomes through agriculture productivity and marketing; and SO3 focuses on improving community resilience to food insecurity.

Key among the community resilience interventions are small-dams, small-scale irrigation schemes, and community gardens. This study has shown that these assets have provided an alternative pathway to ensuring food security and livelihoods. It has also highlighted the sustainability and upscaling issues communities are increasingly facing to meet the growing demand for irrigated plot. Expanding small-scale irrigation is a much larger issue to be addressed by the community alone. The support of the government, development partners, and relevant stakeholders will also be important.

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Abbreviations

ABBS	Annual Beneficiary Based Survey
AGRITEX	Agricultural Technical and Extension Service
AMC	Asset Management Committees
CPC	Civil Protection Committee
CRM	Climate Risk Management
DFSA	Development Food Security Assistance
DMC	Disaster Management Committee
DRR	Disaster Risk Management
EMA	Environmental Management Authority
EMMP	Environmental Mitigation and Monitoring Plans
ENSURE	Enhancing Nutrition Stepping Resilience and Enterprise
ESC	Environmental Sub-Committees
FAW	Fall Army Worm
FFP	Food for Peace
IEE	Initial Environmental Examination
IPPC	Intergovernmental Panel on Climate Change
NRM	Natural Resources Management
RDC	Rural District Council
SO	Strategic Objective
VS&L	Village Savings and Loan
WMC	Watershed Management Committee
ZINWA	Zimbabwe National Water Authority



Through ENSURE, Mellyne's mother joined a savings group and bought her first goat.

Key Messages

This study has the potential for wider applicability in other similar agro-ecological zones in Zimbabwe and in other countries highly vulnerable to climate shocks and disruption. Key messages for informing future work include:

- **The need for shifting the paradigm in agricultural development to reduce dependency on rainfed agriculture and monocropping.** Zimbabwe is severely affected by climate shocks and weather extremes, making rainfed agriculture highly vulnerable. Communities with access to irrigated plot are now diversifying into high value crops and vegetables, resulting in improved income and nutrition. Increased availability of water and pasture have also improved livestock health and productivity. The program has also successfully piloted the introduction of aquaculture. This has helped communities to see that there is an alternative pathway to improve food security and nutrition.
- **The transformative power of small-scale irrigation schemes for building the resilience of smallholder farmers.** Irrigation was a “life-changer” that made possible other critical interventions, such as community gardens. Members of the garden are now harvesting and selling high-value crops and vegetables to improve their income and nutrition. Many have invested that money in diversifying their assets, mostly in agriculture (e.g., chickens, sheep, goats, etc.) and a few outside of agriculture (e.g. sewing machine).
- **The garden is also a platform for sharing knowledge, innovation, and practices.** Members and non-members in the community meet to discuss and share their experience with good practices. It is often referred to as a “knowledge hub,” a “learning centre of good practices,” and “an innovation centre.” An example is the introduction of aquaculture in water-scarce communities that was never thought to be possible before. Community members reportedly are having a more reliable schedule of meetings with the AGRITEX officer at the garden. It is also contributing to social cohesion that was not anticipated before.
- **Gender equality has brought fundamental economic and social change in the community, which has been a game changer.** This again is fully displayed in looking at absorptive capacity (dietary diversity, asset diversification), adaptive capacity (increasing income), and transformative capacity (women empowerment, change in power relations). Gender training has alleviated women's “time poverty” through the active participation of male engagement in various tasks that were traditionally seen as a “woman's” role. Women are well represented in the Executive Committee of the Asset Management Committee, the Disaster Management Committee, the Village Saving and Loans Groups, and Market Facilitation Committee. This has led to an equitable distribution of the garden produce and income between men and women.
- **Strengthening community-owned institutions and linkages with local government and authorities.** This is what has made ENSURE's community resilience intervention a success and will provide a firm foundation for sustainability.



An individual interview is conducted with the Chair of the Asset Management Committee, Bikita District, Ward 2.

For example, in all the wards visited, the Environmental Sub-Committee (under District Environment Committee) is closely linked and actively supporting the community institutions created by ENSURE (i.e. Asset Management Committee, Watershed Management Committee, Disaster Management Committee) in the formulation of by-laws, the environmental patrol of the dam area, and the garden, as well as in organizing environmental awareness campaigns and events.

- **Sustainability of community assets when ENSURE ends: The overwhelming response among interviewed farmers and community leaders was that they will sustain the assets they have created after ENSURE ends.** Some of the main reasons for this include targeted training in good agricultural and natural resource management practices, having an effective by-law, garden constitution, and enforcement mechanism, and strong linkages with all the relevant government institutions and local authorities. TANGO's most recent evaluation on ENSURE confirms that the community is proud of the asset they created and committed to its sustainability.² It is a remarkable achievement.

This study will be helpful to all the relevant government institutions in Zimbabwe, bilateral agencies such as USAID, multilateral agencies, and non-governmental organizations that support Zimbabwe in addressing food security issues and building community resilience to climate shocks and weather extremes.

Study Methodology and Limitations

In June 2019, World Vision's (WV) US-based Senior Technical Advisor for Environment and Natural Resources Management and ENSURE's Technical Manager for Natural Resources Management and Disaster Risk Reduction (from WV Zimbabwe) conducted a review of ENSURE's efforts to enhance community resilience. This study examined beneficiaries views and perceptions on the impact, lessons learned, and sustainability on some of the key program interventions. The aim was to examine beneficiaries views on impact and provide insights on the lessons learned as well as on sustainability and potential scalability of ENSURE's interventions in building community resilience to shocks. The guiding questions for this review were:

- Did the project participants apply improved agricultural and natural resource management practices and technology promoted by ENSURE, and were they relevant?
- Did the wards and community visited have Disaster Management Committees with DRR plan developed by communities and endorsed by the District Civil Protection Units? Did communities receive early warning information, and what were the channels? Did they find it helpful?
- What are the most crucial interventions of ENSURE that has reduced vulnerability to food insecurity in times of crisis based on the views of the community and field technical experts directly working with the program? What are the most promising technology and practices that can be recommended for upscaling?
- Does community institutions have effective by-laws and constitutions in the management of community assets and natural resources? Are they working closely with the traditional leaders and local government structures?



After Susan began participating in ENSURE, her family experienced growth in many domains, including health. She learned about the benefits of exclusive breastfeeding, something she was able to achieve with her last child and teach other mothers about.

- Has the program changed the way communities think about gender equality? Has there been a significant change in leadership and the decision-making role of women in the community?
- Has the program contributed to a demonstrate of an alternative pathway in ensuring food security and livelihood to the traditional rainfed agriculture dominated by monocropping?
- Can the community sustain the operation and management of the assets created in building resilience after ENSURE comes to an end?

The review was conducted in four districts (Chimanimani, Chipinge, Bikita and Zaka) and at eight sites. At each site, two individual interviews and one focus group discussion was conducted. A total of 16 people (10 women and 6 men) were interviewed. They were executive members of the Asset Management Committee and actively involved in farming. The focused group discussion involved five to seven people who were members of the Disaster Management Committee, Watershed Management Committee, and Environmental-Sub Committee. A total of 50 people participated in the focus group discussion. After the individual interviews and focus group discussion, the reviewers conducted an on-site investigation of the watershed and the assets created by the community (i.e. small dams, irrigation scheme, garden, livestock watering points, etc.) along with community leaders and beneficiaries in order to validate the response.

The project sites for field investigation were selected after careful consultation between the ENSURE SO3 program manager and WV and CARE field staff, as well as the Department of Agricultural, Technical and Extension Service (AGRITEX), given its support to ENSURE at the ward and village level. Expert sampling was also used in the selection of interviewed farmers and the focus group discussion. In addition, WV and CARE technical staff working for ENSURE and AGRITEX officers were interviewed and provided information in the data generation for this study.

Limitations

As explained above, the study used several combinations of qualitative methods in generating data for this investigation. This methodology was appropriate for the purpose of this study.

The study was not intended to generate statistically reliable data on income or yield that requires a large-scale quantitative study. With regard to income, ENSURE has suspended collecting data on income because of multiple currencies used, different prices for the same item, and a fluctuating exchange rate. However, some information was gathered during individual interviews, specifically if there was an improvement in yield and income, to give some insight on the program impact at household level. The reported figures by farmers should be taken cautiously.

Furthermore, the study was taken during a time when a large part of the area visited was impacted by Cyclone Idai and also experiencing dry spell related to light El Nino event. As a result, farmers were generally reserved in speaking about yields and incomes, particularly in the focus group discussion.



Cyclone Idai impacted the school bridge in Chipinge District, Ward 4.

Contextualizing Resilience and Climate Shocks in Zimbabwe

Recent reports from the Intergovernmental Panel on Climate Change (IPCC) warn that Southern Africa is on track to experience some of the world's most severe changes in its terrestrial and marine ecosystems.³ Southern Africa, including Zimbabwe, will experience a much drier future, with frequent and intense drought and lower precipitation in the Limpopo and Zambezi basin.⁴ These successive and severe climate-related impacts are due to global events related to environmental changes and interaction between sea surface temperature and atmosphere, which many scientists attribute to human-induced climate change.

To date, climate shocks and weather extremes in the region have been frequent and severe. From 2015-2016, Southern Africa suffered one of the most devastating El Nino episodes, resulting in one of the worst droughts in 35 years. Rainfall from October 2015 to January 2016 (typically the main rainy and planting season) was so dry that planting was nearly impossible, and resulted in widespread crop failure.⁵ Across Southern Africa, nearly 40 million people faced food insecurity and about 23 million needed urgent humanitarian assistance. Five countries (Zimbabwe, Lesotho, Malawi, Namibia, and Swaziland) declared national drought emergencies⁶ and suffered a total of 650,000 livestock deaths.⁷

Zimbabwe was among the countries most severely impacted by the 2015/16 El Nino. Approximately 75% of the country received less than 95% of normal seasonal rainfall, leading the country to declare a national state of disaster. Over 4 million people faced food insecurity at the peak of the lean season in 2016, amounting to 40% of the rural population. Maize production declined by one-third as compared to 2015. The above-normal temperature and lack of water led to poor pasture and vegetative conditions, as well as over 25,000 cattle deaths.⁸

In 2017, Zimbabwe's challenges were compounded by the arrival of La Nina conditions (the opposite of El Nino), which resulted in severe flooding in many parts of the country.^b In 2018/19, while still coping from these successive shocks, Zimbabwe faced yet another weak El Nino. A prolonged dry spell followed until March and resulted in widespread wilting and reduced pasture for livestock.⁹

In March 2019, Cyclone Idai struck central Mozambique and brought devastating rains and floods to southern Malawi and Eastern Zimbabwe.¹⁰ Torrential rain and heavy winds resulted in riverine floods, flash floods, and landslides over the eastern Zimbabwean province of Manicaland, severely impacting the Chimanimani and Chipinge Districts.

ENSURE Approach to Community Resilience Building

The USAID Food for Peace (FFP)-funded Development Food Security Assistance (DFSA) Enhancing Nutrition Stepping Up Resilience and Enterprise (ENSURE) was designed to respond to Zimbabwe's chronic malnutrition and the frequent climate-related shocks affecting a large segment of the rural population. ENSURE has been implemented since 2013 by the WV-led consortium, which includes CARE, SNV, and SAFIRE. ENSURE's goal is to improve food security and resilience of targeted communities and households in six districts: Buhera, Chipinge, and Chimanimani Districts in the Manicaland Province and Bikita, Zaka, and Chivi

^b EL Nino warms the ocean in the equatorial Pacific, often resulting in droughts in Southern Africa and Zimbabwe. La Nina is the reverse, whereby the cooling of the same area results in flooding and above normal rainfall in the same part of the region. Source: <https://www.unocha.org/es/themes/el-nino/el-nino-and-la-nina>

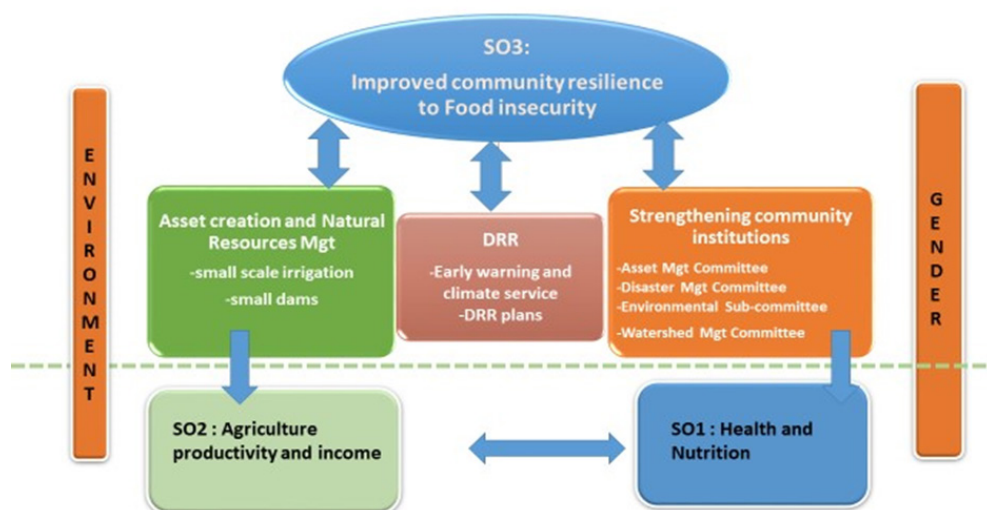


Gertrude is more hopeful for the future after participating in ENSURE. She is a community health worker and is part of a savings group, as well as a poultry producing group.

in the Masvingo Province. These districts were selected based upon multi-stage targeting criteria informed by the Country Specific Information and eight criteria of indicators from FFP:^c

ENSURE operates in semi-arid and arid areas, classified as agro-ecological regions IV and V. These regions are prone to recurrent climate-related shocks that result in widespread losses of assets, crop failures, and severe food insecurity. In addressing these challenges, the ENSURE program is organized into three Strategic Objectives (SOs). SO1 focuses on enhancing nutrition among women of reproductive age and children under five years old; SO2 focuses on improving household incomes through agriculture productivity and marketing; and SO3 focuses on improving resilience to food insecurity of communities. Environment and gender are cross-cutting themes to be mainstreamed in all the SOs (See Figure 1).

Figure 1: ENSURE Key Components to Enhance Food Security and Resilience



Core Intervention in Strengthening Community Resilience

ENSURE views community resilience as a combination of natural capital, social capital, and collective action to empower community structures to mitigate environmental risks affecting their livelihood.¹¹

As indicated in Figure 1, ENSURE's goal to improve community resilience (SO3) is anchored in three pillars: (i) disaster-risk reduction (DRR); (ii) asset creation and natural resource management; and (iii) strengthen community institutions (Figure 1). All of them have synergy with each other, as well as with SO1 and SO2. Each of these pillars is described in more detail below.

c 1) Prevalence of stunting; 2) level of food insecurity; 3) history of food assistance; 4) population demographics focusing on PLW and CU2; 5) agro-ecological zones 4 and 5; 6) combined HH income distribution and food consumption scores to target where integrated food and nutrition security strategies are most appropriate in addressing chronic vulnerability and malnutrition; 7) ability to monitor program sites; 8) potential for market linkages and complementarity with USAID priorities for nutrition and economic growth.



Through ENSURE, Portia and her husband gained access to a market to sell their sorghum. In the past, they had plenty to sell, but no where to sell it.

I. Disaster Risk Reduction and Early Warning System

The ENSURE program developed 66 ward-based DRR plans based on risk and vulnerability assessments that the team conducted at the start of the program in 2014. These plans are reviewed on an annual basis, incorporating new and emerging hazards. To further strengthen disaster preparedness and response mechanisms, the program has established clear channels that allow dissemination information from relevant government agencies (e.g., Meteorological Services Department and Civil Protection Committees) to vulnerable groups at risk. The channel of dissemination includes peer to peer, village assembly meetings, public notices at schools and service centres, text messages and WhatsApp groups. The Disaster Management Committee together with local leadership led the participatory development and review of Risk Communication and Early Dissemination plans, which integrate indigenous knowledge indicators (such as tree phenology and wind direction) with forecasts from the Meteorological Services Department (MSD).

2. Asset Creation and Natural Resources Management

ENSURE supported communities with the creation of three types of assets: (i) small-scale irrigation schemes resulting from the construction of small dams; (ii) small-scale irrigation schemes resulting from solar powered ground water extraction; and (iii) establishment of nutrition gardens. In addition to the physical structures, ENSURE supported communities to establish the governance structures necessary to safeguard the functioning and management of these assets after the program ends.

a. Small-scale irrigation schemes through the construction of small dams

Following the 2015/16 super El Nino, USAID provided ENSURE with additional funds for small-scale irrigation schemes. These funds enabled ENSURE to move away from its earlier plans to rehabilitate old and pumped irrigation (a costly and inefficient process), and instead invest in the construction of new small-scale, gravity, and solar-powered irrigation schemes, which are low cost and energy efficient. Over its lifetime, the program has established 48 new small-scale irrigation schemes, of which 40 use gravitational schemes from small dams.

The small dams (often referred to as weir dams) are under seven meters in height and are built with the technical and financial assistance of ENSURE. Their construction relied on local resources as much as possible and the mobilization of community labor.^d Sound environmental management practices—such as tree planting, construction, maintenance of dead level contours, and silt traps—were instituted from site establishment to asset utilization as communities developed and implemented site-specific Environmental Mitigation and Monitoring Plans (EMMPs).

The water comes from a range of sources, including perennial rivers, seasonal streams, and water intake areas from rivers and springs. The irrigation pipes are at a higher elevation and water flows downward (through gravity) to the garden and planting area. Forty-two small dam-based irrigation schemes are now functioning across ENSURE's six districts, benefiting nearly 4,000 households and covering about 100 ha. In addition, one small dam for livestock watering was established in the Buhera district.

^d A dam that is more than seven meters in height does not qualify to be managed by a community; it becomes State-owned and the management rights are then transferred to Zimbabwe National Water Authority (ZINWA).



Thanks to the irrigation system from a new dam, families can rotate crops throughout the year, and they no longer have to depend on the rains.

b. Small-scale irrigation through solar powered ground water extraction

ENSURE furthermore established eight small-scale irrigation schemes based on solar powered extraction of ground water, seven of which are in the Chimanmani District where gardens are about 2 ha on average. The number of irrigation schemes based on ground water extraction was limited, as advised in the Ground Water Capacity Study and Irrigation Assessment Report, which recommended minimal abstraction of underground water due to low water tables in a number of districts that ENSURE is operating in.¹² These recommendations were further supported by the Climate Risk Management (CRM) plan developed by ENSURE as an Initial Environmental Examination (IEE) supplement in 2017.¹³

The solar powered small-scale irrigation scheme uses drip irrigation which promotes water efficiency as it drips into a targeted area where seeds and plants are growing. This approach also reduces evapo-transpiration and soil leaching and contributes to climate change mitigation and adaptation.

c. Establishment of the “nutrition” garden

Closely connected with the irrigation scheme, ENSURE established irrigated gardens (also known as nutrition gardens), which are intended to improve dietary diversity, nutrition, and the production of horticultural crops that bring cash income. In villages with these gardens, participants cultivate vegetables (tomatoes, carrots, various greens) with high micronutrient content and high value crops (such as sugar beans, squash, ground nuts) for both consumption and income. Most of these small-scale irrigation-based gardens are 1.5 to 3 ha in size and support 60 to 100 household members. Most gardens have predominately female membership, as a result of gender equality training that was rigorously implemented and monitored by the program.

3. Strengthening Community Institutions in Building Resilience

Among the key community institutions ENSURE has established are Asset Management Committees (AMC), the Disaster Management Committees (DRM), and the Watershed Management Committees (WMC). ENSURE's SO3 has also supported capacity strengthening of these resilience building institutions through training, mentoring, and coaching. In addition, ENSURE has strengthened linkages between these committees and relevant government institutions, particularly with the local authority at district level.

a. Asset Management Committee(AMC)

Asset Management Committees (AMC) are one type of community-owned institution created under ENSURE. Each AMC is elected by village members and is responsible for the administration and management of all assets created by the community (notably the garden, dam, and small-scale irrigation scheme) as well as other assets, such as water supply for livestock and domestic use. Each garden has its own constitution stipulating by-laws on members' roles and responsibilities on a range of issues, such as following a planting calendar designed with agronomic advice; the efficient use of water resources; the application and disposal of pesticide; guarding the garden; and cutting trees around the garden or the catchment area. Local government and traditional authorities support the AMC in enforcement of the constitution and adherence to set penalties.



Irrigation Committee members plant fruit trees.

b. Disaster Management Committee (DMC)

Disaster Management Committee (DMC) is a community-based structure that operates at both village and ward level. This committee works together with local leadership in the development, implementation, and subsequent review of the community-based Disaster Risk Reduction (DRR) plans in every ward of the ENSURE program. The DMCs are linked to the local community and leadership in mobilizing support for collective action. Being the core of the Risk Communication and Early Warning system, they ensure that warning messages are respected, recognized, and understood. Civil protection committees, including key government departments such as Meteorological Services Department (MSD), support the DMCs in enhancing public awareness and disaster preparedness actions at the community level.

c. Environment Sub-committee (ESC)

Environmental Sub-Committees (ESC) are statutory ward-level structures that report to the Rural Development Council (local authority) and the Government Environmental Management Authority (EMA) at the district level. The ESC is responsible for enforcing environmental regulations, raising community awareness of environmental issues, and recommending policy on environment and natural resources-related issues working with traditional leadership. In program areas where ESCs did not exist, ENSURE has helped to establish new ones to fulfill these functions. The ESCs in all the wards visited are very functional. This was also confirmed by the ENSURE 2019 ESC Assessment Report.

d. Watershed Management Committees (WMC)

Watershed Management Committee exists at ward level. There is a strong overlap on the roles of the watershed management committee and the ESC. The ESCs support the Watershed Management Committee and the Asset Management Committee in the formulation of by-laws, undertaking environmental patrol of the dam area and the garden, awareness campaign and organizing environmental events and field days at the village level in collaboration with neighboring wards. This aims to protect common watersheds and rivers, as well as bring issues, environmental plans, and recommendations to the District Council and EMA.

Highlights of Community Resilience Outcomes

This review assesses the impact of ENSURE's interventions in community resilience through three distinct and interrelated outcomes. It comprises absorptive, adaptive, and transformative capacity, which will strengthen the community and targeted population to reduce and mitigate risks and shocks.¹⁴ As will be shown, there will be activities that will contribute to one or more of the capacities in building resilience, depending on the context.

I. Absorptive Capacity

ENSURE has supported communities to put in place several structures and systems intended to enhance absorptive capacity, which is the ability of households and the community to cope and face adverse conditions as well as create stable conditions that can facilitate long-term adaptation and transformation of some of the drivers of shock and stress. These interventions include the creation of DRR and the Early Warning and Risk Information Systems, support for market-oriented production and access to markets, diversification of assets, and the introduction of Village Savings and Loans (VS&L), dietary diversity, and social assets.



Before participating in ENSURE, Rosy and her family could barely make ends meet. She has since learned new skills to improve their lives.

a. DRR and Early Warning System

DRR is one of the pillars of SO3 and its Early Warning system is an example of ENSURE's efforts to enhance absorptive capacity. All the ward and villages visited during this review were found to have functional and vibrant Disaster Management Committees with a DRR plan that was endorsed by the District Civil Protection Units. All interviewed farmers have received training in DRR and a number of them were involved in the development of the DRR plan at the ward and village level. They have also confirmed they had received mobile messages and information on social media, such as WhatsApp.

The Disaster Management Committee is also credited by all interviewed farmers, focus group participants, and AGRITEX officer for the valuable information it has provided through its Early Warning System on the current EL Nino, Cyclone Idai, and fall armyworm (FAW). This finding is in line with the 2018 Annual Beneficiary Based Survey (ABBS) and USAID/FFP's Environmental Status Report 2019, which reported that 83% of the targeted men and women received early warning information and 90% have received one of the four measures of DRR (i.e. watershed management, NRM, asset creation, community intuitions). ENSURE has also partnered with the Metrological Service Department to distribute automated community radio messages to increase the existing channels through which early warning and risk information is disseminated.¹⁵ For example, some interviewed farmers indicated that ENSURE has disseminated messages about Cyclone Idai through various channels (i.e. WhatsApp, radio, text messages). Some farmers living in lower ground and flood-prone areas have heeded this call and moved to higher ground and avoided major damage from the destructive storm.

Training in watershed management, NRM, conservation measures, irrigation, and asset management is also considered part of the DRR measures in ENSURE's performance indicators. As a result, nearly all the members of the small-scale irrigation schemes and non-members in the village said they had received training related to DRR and other environmental measures aimed at building resilience. Women represented 44% of the number of people in leadership roles in DRR Committees.¹⁶ Members of both the Village and the Ward Disaster Management Committees said they have strong linkages with local government and the District Civil Protection Committee, which they believed have further strengthened their ability to buffer shocks and create better conditions to adapt for long-term development goals. For example, during the field visit at Chipinge district (the Maraten small dam-based irrigation scheme), the pipeline taking water to the garden was destroyed by Cyclone Idai. The Asset Management Committee received technical assistance from the District Civil Protection Committee to repair the pipeline.

b. Access to markets and market-oriented production

ENSURE has also provided training on Farming as a Business through which the program has introduced farmers to market-oriented production for selected value chains, trained agro-dealers, and producer groups in input and output marketing, disseminated local market information, and facilitated market agreements for certain products.¹⁷ During a field visit for this review, interviewed members of the gardens shared their satisfaction with the AMC's introduction of a new system for registering some of their high-value crops such as tomatoes, sugar beans, and ground nuts, which are then sold collectively to local businesses and dealers. Farmers are receiving much better prices with this approach than with their previous approach to selling crops individually. A good example of the



A woman harvests vegetables in the Chimanimani District, Ward 4.

importance of market access was seen in the Nemaramba Garden in the Chimanimani District, where local businesses in Mutare were coming with small trucks directly to the garden and buying and transporting tomatoes to their businesses.

Most members of the gardens have increased their income from the sale of tomatoes and other vegetables, which they credit to ENSURE's marketing arrangement with dealers and small enterprises. With increased incomes, members said they are buying food items in the market, such as maize and small grains (sorghum and millet) as well as poultry and small ruminants (i.e. sheep and goats) that is helping them to better cope with the dry spell caused by the current El Nino.

c. Asset diversification

Interviewed farmers and community leaders indicated that large number of the farmers who have earned a good income from the sale of their garden produce have invested that money in buying chickens, guinea fowls, and sheep and goats, thus diversifying their assets. These assets have enabled farmers to earn an income and also use them as a source of food, particularly in communities affected by El Nino and Cyclone Idai. This diversification of asset outside crop production is serving as a coping mechanism and enhancing communities' and households' capacity to absorb immediate shocks.

d. Village Savings and Loans (VS&L)

Village Savings and Loans (VS&L) schemes have provided loans for women and poor households to access loans to buy small ruminants. In this review, several participants indicated that owning these ruminants has enhanced their coping and absorptive capacity during a drought year. More information on VS&L can be found in the attached reference.¹⁸

e. Dietary diversity

The small-scale irrigation scheme made it possible for communities to maintain a garden and the year-round production of nutritious food and cash crops. Community members believe the garden has played a crucial role in improving their food security situation and reducing their vulnerability in the current dry spell caused by El Nino in the 2018-19 planting season. All interviewed farmers and ENSURE staff reported improvements in dietary diversity and the nutritional value of food intake among the beneficiaries and the community now, as opposed to prior to the introduction of the irrigated garden. The main reasons for this include: (i) households and children are now frequently consuming fresh vegetables and various produce that are rich in micronutrients; (ii) communities and households have learned about solar drying and now process some of the freshly produced vegetable (i.e. tomatoes, cabbages) into powder to use them as porridge to feed children under five during the dry and lean season; (iii) child-bearing women and children are now consuming freshly produced vegetables such as spinach, which is rich in iron; (v) children in the local primary school feeding program are getting fresh vegetables from the garden; and (vi) people in the surrounding community are buying vegetables and other produce at affordable prices, which would otherwise have not been possible during the current EL Nino period.

f. Social capital

The new village and community-owned institutions created by ENSURE—notably the



A woman farms the land in Chiramba 2 Garden, Chimanimani District, Ward 4.

AMC, the DRR Committee, and Watershed Management Committee—has given a platform for community members to come together towards a common development agenda and to share information and experience. Some of the interviewed farmers, who are not members of the garden (in the Chipinge, Chimanimani and Bikita Districts), indicated they have learned improved agricultural practices from their neighbors and friends who are members of the garden. They are now, for example, applying mulching and composting to maintain soil fertility as they are not able to afford fertilizers.

In addition, this committee mobilizes labor for collective action in the Chimanimani district. The interviewed members indicated that the DRR committee in ward 4 was instrumental in mobilizing communities to work on repairing damaged bridges in the aftermath of tropical Cyclone Idai. Local villagers volunteered to provide labor and the business community at Nhedziwa Growth Point then provided food to for the workers.

g. Social safety nets

ENSURE's asset construction phase of the program provided social safety nets for communities to cushion them against food insecurity as they provided their labor in exchange for a food ration during the construction of the small-scale irrigation schemes. ENSURE FY17 Annual Results Report showed a peak of 7,662 participants (3,207 males and 4,455 females) received food rations during the 2016 El Nino-induced drought.¹⁹ In addition, the program rolled out a Lean Season Assistance activity for eight months across its six districts of operation, through which the program fed a total of 315,802 participants (137,593 men and 178,209 women). ENSURE also distributed a total of 16,248 metric tons of sorghum, pulses, and vegetable oil to communities. This was the main source of food during the peak hunger season (January to March 2017), reducing the number of people resorting to negative coping strategies as reported in the ENSURE FY17 Annual Results Report.

2. Adaptive Capacity

Adaptive capacity is a planned decision and incremental change to better manage and adjust to conditions that are about to change or have changed, such as promoting good agricultural practices and diversifying livelihoods to make communities resilient to climate-related risks and disasters.²⁰

The irrigated garden has provided a strong foundation for improving communities' adaptive capacity to shocks. Through the garden intervention, communities have been introduced to improved practices, which have increased income, diversified their assets and livelihoods, and enhanced access to productive resources. Some of the main interventions contributing to adaptive capacity are featured below.

a. Improved agricultural practices and natural resources management

All the interviewed farmers who are members of the garden indicated that they have applied improved agricultural and natural resource management practices they learned through ENSURE training. These trainings have covered a range of topics, including: improved seed, agricultural practices, livestock management, pest and pesticide management, soil fertility and management, water management (gravitational and drip irrigation), post-harvest storage and processing, marketing, and climate change adaptation and mitigation.



A member of a community garden shows the site to the review team in Zaka district, Ward 25.

One of the innovative agricultural practices introduced and enforced through the garden constitutions is the cropping calendar. All members must plant and harvest crops according to the planting calendar they develop in close consultation with the AGRITEX officer and ENSURE field staff. Some of these practices include: crop rotation aimed at enhancing soil fertility and pest and disease control; planting of different species with different rooting depths so they are able to absorb more micro-nutrients; avoiding planting tomatoes after potatoes and squash since they have similar pest predators; planting carrots, sugar beans, and cabbages after tomatoes; and planting legumes such as beans that fix nitrogen in the soil.

The use of organic manure is also highly recommended in areas such as Chimanimani that have sandy soil. In these types of places, the manure helps to form a crump structure that increases water absorption capacity which is difficult to attain through the application of inorganic fertilizer.

Mulching is also recommended, as there is a high evapotranspiration rate in the arid and semi-arid areas in which ENSURE operates. To improve soil fertility and productivity in these conditions, members of the garden are trained to leave the residue and even import compost from their surroundings.

Given the frequent El Nino events and erratic rainfall patterns experienced in most of the project areas, ENSURE has promoted drought resistant and early maturing crop, such as sorghum (Macia) and millet, in most vulnerable areas such as the Chipinge District. Nitrogen fixing legumes, such as ground nuts and cow peas, enhance soil fertility and cope better to dry conditions. Fodder crops such as velvet beans (mucuna), sun hemp, and sweet sorghum improve soil fertility and enhance livestock feed during the dry season.

ENSURE has introduced drip irrigation in all solar powered small-scale irrigation schemes that are based on underground water extraction. Drip irrigation uses water much more efficiently since water goes directly to the plant area and there is minimal leaching and erosion. It also reduces evapotranspiration and mitigates the impact of climate change in arid and semi-arid areas while freeing some women from at least one demanding agricultural activity. As one of the women in the Chimanimani District (Chiramba 2 Small-Scale Solar Irrigation Project and Garden) explained, the drip irrigation system works by turns with allotted time for each member and enforced by garden constitution. This enables them to go back home and tend to other family or income-generating activities before they need to come back to turn off the water. The women also have the option to send their husbands or neighbors to do it on their behalf.

b. Platform for knowledge, innovation, and practices

The garden has become a place where members and non-members in the community meet frequently to discuss and exchange ideas and experience. Farming households and community leaders now attribute it as a “knowledge hub,” a “learning centre of good practices,” and “an innovation centre.” Here, community members can see, discuss, and share the adaptive technologies and practices that are helping them to cope with climate-related shocks and weather extremes and move towards long-term development. Many interviewed farmers reported that the garden is now the most reliable place for the



Ruramai Tipi, head of the Irrigation Committee, leads a group out to the tree-planting site at the community garden.

AGRETX officer to make a regular visit and where the whole community can benefit from the training.

One of the women farmers in the Zaka District, who is not a member of the irrigated garden, shared that she was inspired to have a small garden of her own because of her interactions with her neighbor, who is a member of the garden. She has learned and adopted good agricultural practices as a result of those discussions. Community members now report having more regular visits and training by AGRITEX officers. The garden is also contributing to social cohesion that was not anticipated before.

During the field visit in Bikita District, the Chair of the AMC credited the garden with providing a platform to discuss and pilot the introduction of aquaculture that was never thought to be possible before in this water scarce areas.

The garden is also contributing to social cohesion that was not anticipated before.

c. Increasing income

All the gardens visited during this mission were focused on producing high-value crops, such as tomatoes, sugar beans, squash, ground nuts, and vegetables. Interviewed farmers indicated that the last harvest (mainly of tomatoes) earned them an income ranging from 250 to 800 Zimbabwean dollars (bonds), which is a good income in the area. They are now harvesting and selling high-value crops three to four times a year, which they were not able to from the dryland and rainfed farming.

In nearly all the cases in which members of the garden reported an increased income, they also indicated that they were able to buy maize and other staple foods from the markets. This purchasing power has further enhanced the food security of their families. Some of the members also noted that they can use this income to pay school fees for their children.

Farmers also noted an increase in income as a result of the small dams, which serve as a major source of water for livestock for both members and non-members of the garden. The construction of these dams has reduced the distance livestock travel and has thus reduced weight loss, particularly during the dry season. As a result, pasture and livestock well-being has improved and some interviewed farmers said they did not have as sharp of a decline in the livestock price during the dry season as they did prior to the small dams. As indicated earlier, this increased income has led most farmers to invest in assets, notably small ruminants. In addition, some farmers have invested in diversifying their livelihood outside agriculture. A good example is a woman farmer in the Chiramba 2 Garden (Ward 4) in the Chimanimani District, who bought chickens after her first harvest from the garden two years ago. She reported a continued increase in income from the sale of tomatoes, onions, and carrots. She bought a sewing machine and started preparing uniforms for the local primary school. Sewing brings in a better income and she is spending less time on farming. She is able to buy food items from the market and can now afford to pay for her two children to attend primary school. She claims that the current El Nino did not impact her family as much and attributed this to income from the irrigated garden and her new sewing business. Hence, increased income is helping farmers to diversify their assets and livelihoods within and outside agriculture.



The women above, from the Executive Members Asset Management Committee in Zaka District, Ward 14, were interviewed.

d. Access to productive resources

Access to an irrigated plot, however small, is seen as a “game changer” by the community since it makes possible year-round production. Every member of the community the research lead met with during the field visit hoped to be a member of the garden and to have access to an irrigated plot. They have seen first-hand how well vulnerable households are able to adjust to climatic events and stresses and how even non-members have benefited from their interaction with members of the garden. As a result, in all of the gardens visited, the Executive Members and Chair of the AMC are actively trying to expand the cultivable area under irrigation and to increase the number of beneficiaries. This is a challenge that cannot be addressed by AMC alone. Rainfed agriculture is under increasingly serious threat in these fragile areas due to climate change and variability, and more investment will be required from various sources to support the expansion of irrigated plots and expansion and management of reliable water sources.

3. Transformative Capacity

Transformative capacity is about making intentional change to address the power imbalance and structures that are the root causes of vulnerability to shocks, risks, poverty, and injustices. It is about engaging in a long-term shift of values, beliefs, and thinking to promote more equitable and inclusive development. Transformational change is also about policy shifts that will influence change in power relations, empowerment, decision-making, and institutions.²¹ Some of ENSURE’s interventions that have brought transformative changes in power relations and attitudes—and supported communities in moving towards a more equitable and inclusive development path—are featured below.

a. Gender equality

All the women farmers participating in the garden stressed that gender training has alleviated “time poverty,” which women generally face due to the many tasks they are involved in (including weeding, water and wood collection, food preparation, and child rearing). They believed that the garden had encouraged the active participation of their husbands in tasks that were traditionally seen as the responsibility of women. For example, most of the interviewed women farmers indicated that their husbands assist in household chores when they are working in the garden and come along and work with them particularly during the evening when it is their turn to water the vegetables and crops.

Some of the interviewed farmers also suggested that gender-based violence and early marriage had decreased in the last few years as the food security situation and income of households improved due to the ENSURE gender training.

b. Women empowerment

ENSURE has also deliberately planned for women to take on greater leadership and decision-making roles through community institutions and committees. Women are well represented in the Executive Committee of the AMC, the Disaster Management Committee, the Village Saving and Loans Groups and Market Facilitation. In all the gardens visited, at least half (and in some cases the majority) of the Executive Members of the AMC were women. This has led to an equitable distribution of the garden produce and income between men and women. Because women have access to this income, they



Irrigation Committee members pose in front of the community garden and irrigation project.

have been able to invest in food items and buy other assets, such as poultry, that are needed by their families. The importance of women empowerment was well articulated by one woman member of the Executive Committee of the AMC in Zaka District, Chemvuu Garden (Ward 14), who said, “If you want your family to be successful, let women have equal power.”

c. Change in power relations, decision-making, and the constitution

Chemvuu ENSURE’s role in enhancing transformative capacity is exemplified by the garden constitution and its by-laws, which the program introduced for the management and protection for the assets (garden, small dams, water collection) and the environment extending beyond the communities. The garden constitution is endorsed and enforced by the traditional village authorities and local government. Any offense or violation of the garden constitution and by-laws in protecting natural resources is first presented to the Chair of the Executive Member of AMC and then to the village head or the District Administration Office, depending on the nature of the offense.

This process has brought a change in community power relations. Women now see themselves in leadership and decision-making roles. A good example of this change was noticed during a focus group discussion in the Deketera Garden, in the Bikita District, which has five women and three men as Executive Members of the AMC. Asked if they have faced any difficulty in addressing gender related issues in the committee, one woman replied, “So far they have not. But if there is any disagreement with men members, they will table it for vote and can be outvoted.”

Change in power relationship was also noticed with traditional authorities, for instance in cases where the village headman and chief were members of the garden working along with other members. During the interview, the Chair of the AMC in the Nemaramba Garden, in the Chimanmani District, pointed out, “The village headman is a member of the garden working under the garden constitution executed by him. But when he is at the village, he is under the authority of the headman.” Similarly, a woman farmer in Makute Garden, in Zaka District, shared, “The chief of village has an irrigated plot and comes to work in the garden like other members and under the constitution and the supervision of the Chair of the AMC.” Such changes are difficult to imagine prior to the introduction of the small-scale irrigated garden in the community.

d. Strengthening governance mechanisms and institutions

ENSURE’s investment in the creation of community-owned institutions and its support to strengthen their linkages with relevant local and national government institutions are likely to have a lasting impact in communities. The Environmental Sub-Committee is an example (ESC is a ward and district level structure closely linked to all the community institutions created by ENSURE, i.e. WMC, DMC and AMC). The ESC is under the Rural District Council (RDC), which is responsible for compliance with environmental regulations and by-laws, recommending policies on natural resource management, and raising community awareness on environmental issues. The program facilitated the reactivation of existing ESCs and helped to establish new ones where they did not exist.²² The ESCs report to the local authority (RDC) and Government Environmental Management Agency (EMA) at the district level.



Fruit trees are prepared for transplant to the community garden.

All the ESCs we visited during this review were found to be highly functional. The ESCs are actively supporting the Watershed Management Committee and the Asset Management Committee in the formulation of by-laws, in the environmental patrol of the dam area and the garden, in conducting awareness campaigns, and in organizing environmental events and field days at the village. The ESCs are collaborating with the neighboring ward to protect common watersheds and rivers, and are bringing issues, environmental plans, and recommendations to the District Council and EMA. The ESC also works closely with local authorities to enforce the by-laws. For example, if one is found contravening any section of the by-laws, such as cutting trees without permission, it is reported to the village head, a penalty is imposed, and the ESC or the AMC step in to fund any needed services or repairs.

The ESC is also a powerful mechanism connecting communities to district and national regulatory structures. This has brought a major transformational change in environmental awareness, helping to scale messages beyond the community that will assist households to address climate related shocks and hazards.

e. Shifting paradigm in agricultural development

The introduction of the irrigated garden has changed communities' thinking about agriculture in many ways. It has demonstrated an alternative pathway to improving food security and livelihoods that differ from the traditional staple crop-focused agricultural growth paradigm. Discussions with farmers suggest that the year-round production of crops and increased availability of water for livestock has improved households' income, nutrition, and food security, and has reduced women's burdens with some of the demanding tasks. The availability of water has also encouraged investment in small ruminates, which is one way of diversifying assets beyond crop production.

The program has also successfully piloted the introduction of aquaculture in Bikita District, Ward I, Chamanhokwe garden. An ENSURE staff member who worked closely with the community to introduce fingerlings in the water surrounding the dams indicated that after the first year, the community was able to consume and sell fish to nearby hospitals and boarding schools for a good income. As this news has spread in the nearby area, interest in aquaculture in the other small-scale irrigation schemes using dams has grown and Chamanhokwe is now serving as a local source for fish fingerlings. One of the small-scale irrigation dams visited (Deketera Garden, Bikita district) has already bought 1,000 fingerlings that are now breeding in the dam area. During a group discussion, one-woman farmer pointed out, "This is an additional benefit of small dams that farmers and communities never thought would be possible in this area where water is a serious shortage."

The program has transformed the way communities and local authorities look at agriculture. They now have tangible experience in various pathways that have the potential to improve food security, livelihoods, and resilience to climatic shocks and stresses. This shift from total dependency on rainfed agriculture is fundamental in Zimbabwe, given the low and erratic rainfall pattern predicted to affect the region as a result of climate change and variability.



A women farmer displays vegetables in Chipinge, Ward 4.

f. Access to basic services

The small-scale irrigation schemes and garden have greatly changed the lives of very poor households in remote areas with little access to basic services and infrastructure. One of the sites visited in Chipinge District, Ward 4, Chidzadza Garden, was without roads, electricity, or extension services before ENSURE started a small dam irrigation scheme. ENSURE collaborated with local authorities to open a road connecting the village to the Chipinge town and to bring electricity to the primary school close to the garden. The irrigated garden is now a major source of all types of vegetables for areas near the Chipinge town. ENSURE trained farming families to grow high-value crops throughout the year and helped connect them to markets so they are now earning higher incomes. Interviewed farmers also indicated that they now have a reliable schedule of meetings with the AGRITEX officer at the small-scale irrigation or garden site, where they receive extension services for both irrigation and dryland agriculture. The whole village, which was barely surviving and with no access to basic service, has now changed.

g. Engaging youth and changing attitudes towards agriculture

ENSURE did not deliberately target youth at the start of the program. However, many gardens have allocated a plot for the nearby primary school where youth learn and practice farming and take the produce to school and home. The garden is also donating some food and vegetables for the school lunch program in nearby primary schools and working with the Ministry of Education in this regard. High-value crops grown in the gardens, as well as the crop and livestock value chains promoted by ENSURE, are also contributing towards improved household incomes and encouraging positive attitudes toward agriculture.

Some interviewed farmers have pointed out that if there is an opportunity to expand the irrigated garden, it could be a viable option for youth to stay in their community and to earn an adequate income. This would require raising awareness and encouraging participation in irrigated agriculture at the earliest stage to create a more positive attitude towards agriculture, which had been lacking. The Chair of the AMC in the Chidzadza Garden (Chipinge District, Ward 4) indicated that he often discusses with youth at the nearby primary school about creating a more positive attitude towards agriculture by pointing to them their own village, which was once inaccessible by road.

Conclusion and Recommendations

I. Sustainability Issues

This investigation made a concerted effort to address sustainability issues, which are often overlooked in resilience outcomes. In all the discussions held and the communities visited, farming household and community leaders expressed a great sense of ownership and pride about the assets they created through ENSURE, notably the small dams, small-scale irrigation, and the garden. These assets were perceived as having significantly improved their capacity to deal with the impacts of climate-related shocks and has transformed the way communities and local authorities look at agriculture, as explained earlier.

As a result, one of the specific questions asked to farmers and Executive Members of the



A child demonstrates how to use the tippy tap after using the bathroom.

AMC, ENSURE technical, and AGRITEX staff was whether the communities will be able to sustain these assets when ENSURE comes to an end in 2020. The interviewees unanimously agreed they will be able to manage and sustain these assets. Nearly all of them were quick to point out the main reasons for this include: having good training; putting in place an effective constitution and enforcement mechanism; and strong linkages with the Ministry of Agriculture (AGRITEX), the District Environmental Management Office, the District Civil Protection Committee and the Environmental sub-Committee. ENSURE staff and AGRITEX staff also confirmed that adequate capacity had been built at the village and community levels to link them with district level institutions (i.e. District Civil Protection Committee, District Environment Committee) for technical support.

As part of a sustainability plan, AMC has also established asset and operation maintenance funds, where each member of the garden makes a monthly contribution. It also channels the penalties collected in violation of the by-laws and garden constitutions to this fund. AMC is using these funds for repairs and maintenance of the irrigation schemes.

This field investigation and the discussions with ENSURE and AGRITEX staff confirmed the above assessment on the sustainability of the asset created at the community level to enhance resilience. The findings also suggest the need for further actions and safeguarding to address some key areas that might adversely affect the environmental and social sustainability of these assets. These include: (i) promote afforestation, land restoration, conservation, controlled grazing around the dam area and surrounding catchment and take structural and biological measures to control the build-up of siltation; (ii) maintain the gender balance of the Executive Member of Asset Management Committee and all the other relevant committee and community institutions; and (iv) work through local structures and traditional authorities and maintain the provision of technical supervision from all the relevant government agencies.

2. Upscaling

As underscored in this study, communities have seen the benefits of small-scale irrigation in enhancing food security, dietary diversity, income, and assets and livelihoods diversification. All interviewed farmers and community leaders expressed that members of the garden would like to increase the size of their irrigated plots. In addition, others who are not members of the garden would like to have access to irrigated plots.

Furthermore, at the national level, the most recent Zimbabwe Vulnerability Assessment Committee (2019) highlighted that irrigation development is one the key priorities in addressing food security challenges in Zimbabwe.²³ This suggests that there is also a shift at policy level to reduce dependency on rainfed agriculture given the predicted low and erratic rainfall pattern in Zimbabwe and Southern Africa. Hence, there is a compelling reason for upscaling irrigation schemes. The experience of ENSURE could be valuable in this respect.

One of the findings from this study is related to the sustainability and upscaling of irrigation schemes. There is a greater potential for upscaling small-scale irrigation schemes drawing on surface water than expanding ground water extraction. Ground water recharge capacity from many of the arid and semi-arid areas of Zimbabwe (including the ENSURE operating area) are reported to be below the threshold capacity for sustainable use.²⁴

This study has provided very promising results and evidences for upscaling small-scale



Sarah, mother to seven children, has improved her family's livelihoods through a lot of hard work since ENSURE came to her community. She even helped build her community's weir dam, which was done manually.

irrigation schemes in building community resilience to shocks and enhancing food security. Such upscaling should have community ownership. It would require support from the government, development partners, and all relevant stakeholders given that these community institutions alone are most unlikely to meet this demand due to financial, technical, and administrative constraints.

Future Areas of Research

This study has underscored that the asset created by the community through small dams and small-scale irrigation schemes and the garden are an engine for building community resilience. Given the predicted impact of climate change in Zimbabwe agriculture, there will be increasing reliance on water harvesting and irrigation development to meet food security needs. Therefore, further in-depth studies will be needed to (i) identify a more perennial and a broader catchment to retain more water as demand for irrigation is rapidly expanding in all communities visited; (ii) to strengthen the Asset Management Committee, its by-laws, and garden constitutions, which has brought social cohesion and become the foundation of community resilience; and (iii) to continue the outstanding achievement attained in women participation and leadership in Executive Member of the Asset Management Committee. Further studies could be helpful in how the Asset Management Committee can be institutionalized to ensure succession and replication in other areas.



Rosy and her husband, Zacks, learned skills through ENSURE that enabled them to expand their farming efforts and eventually lead programming efforts in their community.

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