# **Key Results and Findings**

Climate Resilience Program Bahi District – Dodoma, Tanzania



A Summary of the Program Evaluation Report 2021-2023



**Evaluators:** 



In collaboration with:





## **Implementing Organizations**

# Anglican Church of Tanzania's Diocese of Central Tanganyika – Development Services Coordination (DCT-DSC)

Dodoma, Tanzania

The Diocese of Central Tanganyika's Development Services Coordination (DCT-DSC) was established in 1999 to expand its scope of social work and serve more people. Since their partnership with Episcopal Relief & Development, DCT's Development Services Coordination work has evolved from supporting small disaster relief grants to building long-term programs that leverage the church's social, spiritual, human, material, and financial capital for lasting impact. Their Integrated Climate Resilience Program aims to improve food security, health, economic development and promote sustainable livelihoods for smallholder farming households in Dodoma, Tanzania.

Join us: www.dsctz.org

#### **Episcopal Relief & Development**

New York City, USA Africa Regional Office – Accra, Ghana

For over 80 years, Episcopal Relief & Development has worked with an extensive network of faith and community partners to advance lasting change in communities affected by injustice, poverty, disaster and climate change. Inspired by our faith, we reach over three million people each year by focusing on four interconnected priorities: nurturing the potential of caregivers and young children, reducing violence against women and girls, strengthening communities' resilience to climate change and facilitating humanitarian response to disasters. Together with our partners, we leverage what's working well to drive impact, learning and sustainability. Together, we create lasting change.

Join us: www.episcopalrelief.org/sign-up

#### **Cover Photo:**

Farmer using minimum tillage approach with a two-wheel tractor ripper. Tanzania, 2023. *Image courtesy of Busela Yuga, DCT-DSC.* 

# **Table of Contents**

ecutive Summary				
Background   Tanzania, Dodoma Region	5			
1   Climate Resilience Program An Asset-based & Integrated Approach	<b>6</b> 7			
2   Evaluation Methodology	8			
3   Results and Findings	9			
Objective 1: Increased food crop production and diversity	9			
Objective 2: Increased vegetation through tree planting and farmer-managed natural regeneration	13			
Objective 3: Improved economic development through Savings with Education	14			
Objective 4: Improved gender equality and equity at the household level	16			
Objective 5: Improved access, supply and availability of clean and safe water	19			
4   Building on Progress	22			
Key Lessons Learned	22			
Conclusion	24			
End Notes	25			

## **Executive Summary**

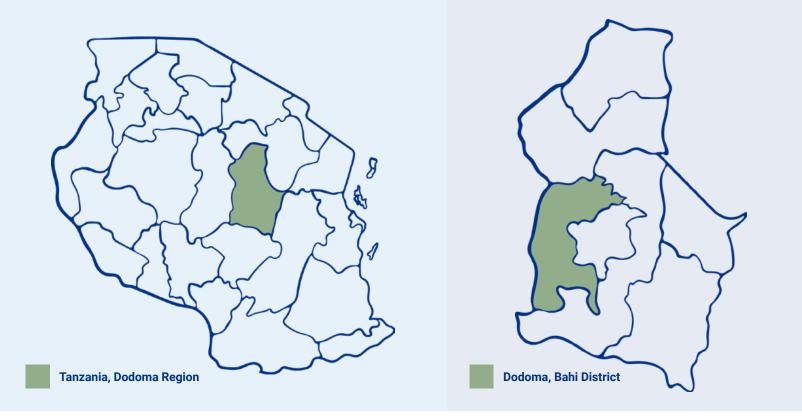
This report is a summary drawn from the full evaluation report conducted in December 2023. It highlights key results and learnings from the DCT-DSC's three-year Climate Resilience Program from 2021-2023 in the Bahi District in Dodoma, Tanzania. This program integrated microfinance, conservation agriculture (CA), water access, environmental conservation and gender empowerment to promote sustainable livelihoods in rural and drought prone communities in central Tanzania. Climate change is affecting the food and livelihood security of smallholder farmers, livestock keepers and landless populations throughout Tanzania, especially women, as they traditionally are responsible for staple crop farming and water collection. Sustainable livelihoods for farmers include climate adaptive agriculture, as well as livelihood diversification. The program's focus on access to savings and loans, as well as training and input provision related to income generating and time-saving interventions (i.e. fuel-efficient cook stoves, water infrastructure, beekeeping, cash crops, etc.) aims to equip farmers with the capital and decision-making power (allowing for flexibility) to make livelihood adaptations in the face of climate change and other challenges.

The findings from the evaluation are positive, while not entirely conclusive.

- From baseline to endline farmers increased the application of CA techniques and the yield of staple crops under CA. On average, farmers' land under CA is .5 acres or less, a small portion of most farmers' land, because of the initial time and labor associated with conservation agriculture.
- 2 Farmers are establishing kitchen gardens with anecdotal evidence of diet and income improvements due to access to vegetables.
- The findings also show important increases in women's household decision-making power, perception of control over household assets and positions of leadership.
- Farmers and other Savings with Education (SwE) members are investing in their household needs and livelihoods and value the business training, relationships and other benefits of being part of a collective.
- Savings with Education is a participatory savings and loan methodology that incorporates financial literacy, business, health and livelihood training. It is a building block of microfinance and a foundational piece to community ownership and sustainability of Climate Resilience programming.
- 6 Access to water has increased where the project has partnered with government to construct or refurbish infrastructure.

From this evaluation, other primary sources and secondary research, several strategic priorities have been validated. Investments in SwE and access to larger loans; livelihood diversification via dry season horticulture and other off-season income generation activities; and collaboration with government for sustainable water access and management are integral for rural households' adaptation and resilience to drought and other crises. There are also intervention areas that need more exploration and piloting. For example, youth livelihoods in rural and urban settings (as they migrate in search of work) must be considered as future generations will be most impacted by climate change with fewer opportunities in traditional livelihoods like smallholder farming. Process evaluations to understand the effectiveness of the sequence and layering of interventions will aid in ongoing efforts towards integrated, multisector approaches.

The learnings from this evaluation are informing the expansion of programming in Tanzania and other high climate risk, rural communities where Episcopal Relief & Development works.



Map of Tanzania highlighting Dodoma Region

Map of Dodoma Region highlighting Bahi District

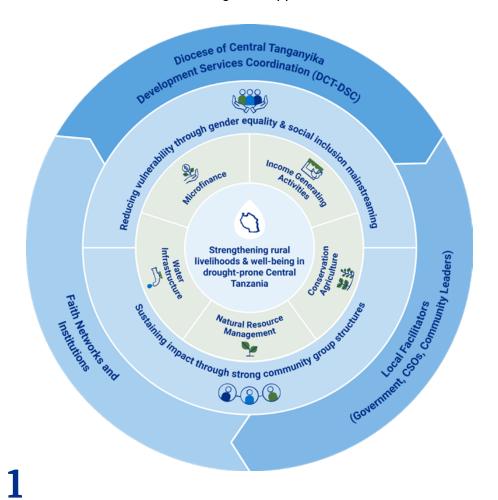
### Background Tanzania | Dodoma Region

Tanzania is a diverse and ecologically rich country in East Africa. For the past year it has been dealing with the complex challenges of climate change while simultaneously striving for economic development and gender equality. The intersection of climate resilience and economic and social development in Tanzania presents a complex landscape marked by progress and persistent disparities. The country is experiencing more frequent and severe weather events, such as droughts and floods in most areas including Dodoma region. Due to irregular and low rainfall, the Dodoma Region is primarily semi-arid.

The Dodoma Region is divided into seven districts: Kondoa, Chemba, Bahi, Dodoma City, Chamwino, Kongwa, and Mpwapwa. The Central Plateau zone where the Dodoma Region is located is well known for producing fruits. Farmers rely heavily on the production cash crops like sunflower, sesame and groundnuts for their livelihoods. Maize, sorghum, millet, rice, pulses, cassava, potatoes, bananas and plantains are some of the principal food crops grown in Dodoma.

#### **Climate Resilient Communities Model**

An Integrated Approach



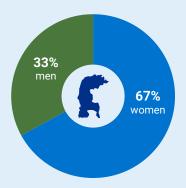
### Climate Resilience Program

The Diocese of Central Tanganyika Development Services Coordination (DCT-DSC) implemented a three-year Climate Resilience Program (2021-2023) in six villages¹ in the Bahi district in Dodoma, Tanzania. The program aims to increase household and community-level climate adaptation through increased agricultural production and diversity, access to water and economic development for over 2,000 smallholder households facing climate hazards through education, training and social behavior change.

The program targets the most economically marginalized groups, particularly women and those living in geographically isolated areas. Households engage in the program through enrolling in Savings with Education (SwE), a member-run savings and loan group that incorporates financial literacy, business, health and livelihood training and education. Trained facilitators collaborate with district and village-level government representatives, faith leaders and non-government organizations for linkages to economic, health, social services and education.

### Participants Reached

2021-2023



3,557 people reached

**3,557**Savings Group members

**3,366** small-holder farmers trained on climate-smart agriculture

#### Climate Resilience Program's Five Objectives:

- 1 Increase food crop production and diversity for 2,160 farmers in 13 communities.
- 2 Improve regeneration of natural vegetation through environmental conservation education in 13 communities.
- 3 Improve farmers' economic development through Savings with Education for 3,075 smallholder farmers in 21 communities.
- 4 Improve gender equality and equity in 2,160 smallholder farming households in 6 communities.
- 5 Improve access and supply to clean and safe water through capacity building of 6 water associations and community-based organizations.

### An Asset-based & Integrated Approach

The program model's community asset-based and ownership approach promote solidarity and social cohesion among program participants and local stakeholders. DCT-DSC's community asset-based approach follows Episcopal Relief & Development's investment in change agents and institutions to foster climate resilience. The change agents include community-based facilitators, such as SwE facilitators, disaster committee members, government extension workers and faith leaders. They are equipped to engage with community members to build agency, social cohesion, innovation

and financial capital. The goal is for program participants to apply new ideas, skills, capital and relationships they gained from the program into household and community-level climate adaptation efforts. Using Savings with Education as an entry point for equipping farmers with the knowledge and capital (financial and social) needed for livelihood strengthening and diversification allows for the collective and community-level solidarity and accountability that can sustain the project interventions.

Create a foundation for agency and empowerment	Work with groups in ways that strengthen social cohesion and accountability	Work with groups in ways that strengthen social cohesion and accountability	Work with groups in ways that strengthen social cohesion and accountability	Build strategic linkages for broader services & increased opportunity for collective action	Program participants invest new ideas, skills and capital into their livelihoods and into community- level climate adaptation efforts
Target communities most vulnerable to the changing climate and the most marginalized members among them and facilitate project planning and assessment processes led by communities	Initiate and expand Savings with Education groups and Disaster Committees which serve as platforms for financial inclusion	Equip group members with training and input support for climate adaptation and livelihood strengthening	Link groups to external financing for climate adaptation and livelihood strengthening, such as grants or microcredit managed by the program or microfinance banks	Link groups to government, private companies and civil society organizations for technical and financial support and services	



Savings with Education Facilitation Training

### 2

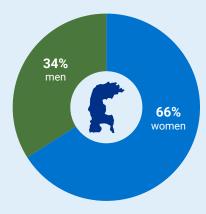
### **Evaluation Methodology**

The endline evaluation was conducted in December 2023 by Inspired Consultants Limited in collaboration with DCT-DSC in the Bahi district in Dodoma, Tanzania where the Climate Resilience Program was implemented from 2021 through 2023. The team used a mixed method approach. Trained enumerators gathered quantitative data using program reports and surveys electronically collected using KOBO Collect and conducted Key Informant Interviews (KII), Focus Group Discussions (FGDs) and used observational tools to gather qualitative information.

The evaluation's objectives are:

- 1 To systematically assess the program's design, activities and outcomes.
- 2 To identify strategies for replication and/or expansion in other program sites.

# **Evaluation Methodology**



**Geography:** Bahi District

**Sample size:** 346 program participants interview, 228 women and 118 men

**Target groups:** women and men participants in the Climate Resilience Program

Program-level participants: farmers, community leaders, village governments, faith leaders, SwE facilitators and members

Community level participants: government representatives, private sector, non-governmental organizations, researchers and academics

**Note:** Participants were selected using a simple random sampling method

Limitation: No counterfactual. The evaluation focused on program participants at baseline and endline.



Farmer trained in conservation agriculture showing his field with hand hoe dug planting stations in Nhome village

3

### Results and Findings

The results and findings are based on comparisons from the baseline conducted in 2021 and endline at the end of 2023. The program overall had a positive increase in all areas. It is worth noting that most people were still impacted by the economic and other impacts of COVID-19 at the time of the baseline, thus may increase the degree of the impact in the data.

# Objective 1 Increased food crop production and diversity

Farmers increased their family's food security and resilience by adopting new agriculture techniques and technologies<sup>2</sup> in response to the changing climate. During the 2022-2023 cropping season, 91% of trained farmers who integrated conservation agriculture (CA), a farming system that promotes minimum soil disturbance, maintenance of permanent soil cover and diversification of crops<sup>3</sup>, saw an increase in sorghum and millet crop yields by three-folds compared to farmers who only used traditional methods.



of trained farmers who used CA tripled their sorghum and millet yields compared to farmers relying on traditional methods



Drying process for pearl millet. Dodoma, Tanzania, 2023.

Participants interviewed reported the following benefits of combining CA with existing climate-smart technologies:

- 1 Increased availability of early maturing and high yielding crops
- 2 Improved soil fertility and soil health
- 3 Improved food security
- 4 Increased crop diversity which translated to increased nutrition

Farmers introduced CA practices gradually starting with .1-acre demonstration plots, then larger tracts of about .25 acres. DCT-DSC and farmers have identified limitations with some of the CA approaches. Since ploughing is not promoted within CA, hand hoeing is often used which is very labor intensive. In response, ripping, or precision tillage with minimum soil disruption, is promoted to reduce the workload on women while attracting more men to CA. Results from household surveys show only 6.2% of respondents had used the ripper at endline. From Focus Group Discussions, reasons for low adoption of ripping were that it was an unfamiliar new technology and farmers are used to ploughs and the ripper does not control weeds between rip lines making weeding another arduous task. Farmers have made adaptations to CA, such as microdosing with chemical weed control, to reduce the labor of weeding.

Participants reported these benefits of integrating CA with existing climate-smart technologies:



Increased availability of early maturing and high yielding crops

......



Improved soil fertility and soil health



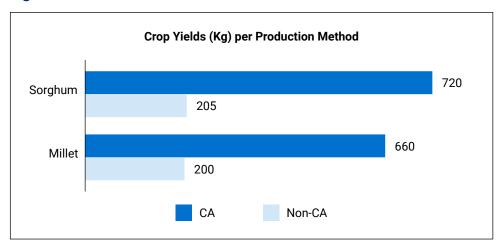
Improved food security



Increased crop diversity which translated to increased nutrition

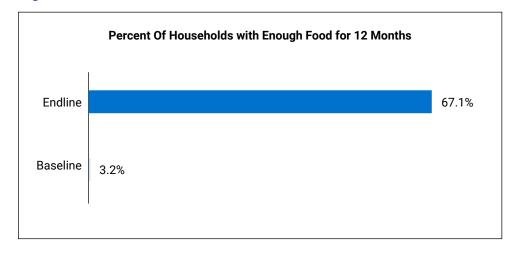
Focus group discussions and key informant interviews also highlighted weak coordination among key actors in the CA sector as a challenge. Government, researchers, private sector, academia all collect data, but information is not standardized and widely shared among stakeholders. The synthesis and dissemination of information about CA processes, successes and challenges is critical for farmers and development organizations alike, as they make decisions on the kind of agricultural techniques they want to invest in.

Figure 1



Endline results show that 67% of families had enough food to last them 12 months compared to 3% at baseline. The increase is in part due to the program's education and training on managing a kitchen garden near their home.

Figure 2





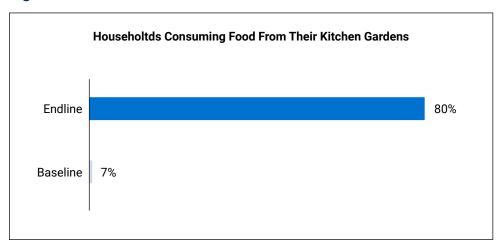
### 3X the yield

Farmers using CA more than tripled their sorghum and millet harvests.

67%

of families had enough food to last them 12 months compared to 3% at baseline.

Figure 3



80% of households surveyed consumed food from their kitchen garden where they have access to green vegetables most of the year. Although more work is needed to ensure all families have access to adequate quantity of nutritious and affordable food, especially from December through February when families commonly experience a food shortage, the results affirm the program's interventions are working. During times of financial constraints, farmers sell vegetables from their kitchen garden or rely on loans from their savings group to purchase food and meet their household needs.

Figure 4





80%
of households surveyed consumed food from their kitchen garden where they have access to green vegetables most of the year



Restored land using farmer managed natural regeneration (FMNR)

### Objective 2

# Increased vegetation through tree planting and farmer-managed natural regeneration

Farmer managed natural regeneration (FMNR) is an agroforestry practice that involves the deliberate protection and management of naturally regenerating woody vegetation by farmers on agricultural land. It is a cost-effective way to restore native vegetation on hectares of land with little human intervention. This includes planting and maintaining trees and plants that are well-adapted to local conditions. As a result of education and training on natural vegetation, the program saw an increase of tree coverage from one acre at baseline to 941 acres at endline. About 65% of farmers manage trees using FMNR compared to 28% at baseline.

The number of trees surviving increased to 74% at endline compared 44% at baseline. On average, farmers planted eight seedlings to increase the chances of survival, especially from September to November during dry season. Drought and livestock are the top two threats to a tree's survival. Farmers in Mnkola and Lukali protect their seedlings by covering the soil with mulch to conserve water and creating physical barriers for livestock.



# FMNR Key Results & Findings

### 941 acres

Education and training on natural vegetation led to an increase of tree coverage from one acre at baseline to 941 acres at endline

65%

of farmers manage trees using FMNR compared to 28% at baseline

74%

of trees survived at endline, compared to 44% at baseline

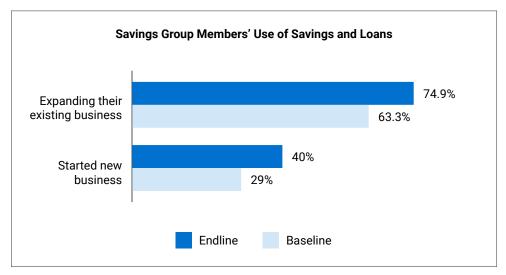


Savings with Education group meeting. Dodoma, Tanzania.

# Objective 3 Improved economic development through Savings with Education

Savings with Education members had an increased sense of financial stability from applying savings strategies, accessing loans from their group's pooled account and deepening their financial knowledge. By the end of the three-year program, results showed an increase in the number of members using savings and loans to expand their business (75% at endline compared to 63% at baseline) or to start a new business (40% at endline compared to 29% at baseline). A majority of group members were women who invested in their small businesses such as tailoring, kiosks for sundries, selling livestock, agricultural goods, electronics, etc. Profits from their business contributed to their family's main source of income from farming, which they have steadily declined due to the negative impacts of changing weather patterns over the years.

Figure 5





# Improved economic development

**75%** 

of members used savings and loans to expand their business, an increase from 63% at baseline

40%

......

of members used savings and loans to start a new business, up from 29% at baseline

"I accessed a loan of 400,00 TZS (\$162 USD) from my SwE group, I added to my capital and expanded my business of tailoring and fabric that I sell to my customers."

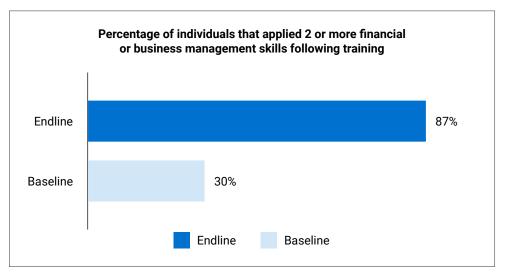
**SwE Member, Focus Group Discussion** 



Meeting of "New Jipemoyo" Savings with Education group. Mpalanga Village, 2022.

Women borrowers also expressed how empowered they felt to be able to operate a business, pay for their family's household expenses and deepen their financial and business management knowledge and skills. The monthly Savings with Education group meeting provides trainings that help borrowers understand how to identify market needs and pricing, learn basic bookkeeping and follow good business practices. The number of borrowers applying two or more skills taught during the monthly meetings more than doubled at 80% at endline compared to 30% at baseline. The members interviewed during the focus group discussions expressed a need for additional training on scaling their business and potentially using digital mobile money tools to make secure and transparent transactions between members.







**87**%

of borrowers applied two or more skills taught during monthly meetings at endline, up from 30% at baseline

"With the savings and loans, I expanded my tailoring business and from this business I met education, food and health requirements for my children. I have also built a new house where I can safely and comfortably stay with my children."

**SwE Member, Focus Group Discussion** 



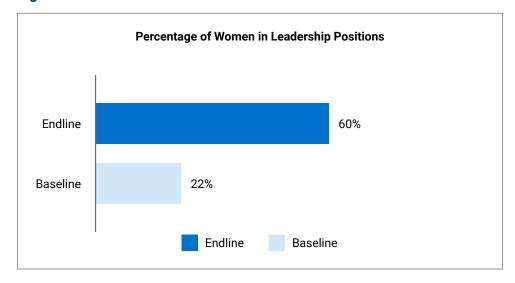
Savings with Education Group Meeting, Mpalanga Village, 2022.

### Objective 4

# Improved gender equality and equity at the household level

Gender equality and equity gradually improved in the last three years. The number of women in leadership positions almost tripled from 22% to 60%. Many of the women hold leadership positions in their church and in their Savings with Education groups. Through outreach and sensitization trainings on gender equity and equality in public and private life<sup>4</sup>, both men and women are slowly moving away from traditional gender norms and behaviors. Men are supportive of their wives engaging in incomegenerating activities and participating in Savings with Education (SwE). SwE has helped women engage outside of the home, gain access to capital, build skills in managing business and household finance and facilitate their savings and loan groups' transactions and meetings.







#### 60%

of leadership positions are now held by women, nearly tripling the previous 22%

#### SwE have helped women:

Engage outside of the home

Gain access to capital

Build skills in managing business and household finance

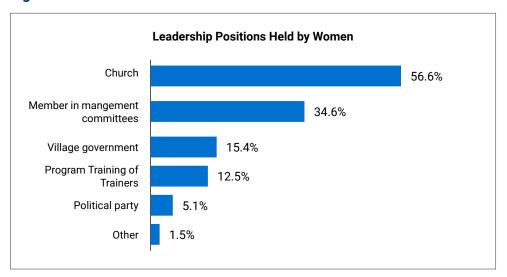
Facilitate their savings and loan groups' transactions and meeting



SWE Group Facilitator leading group discussion during monthly meeting, Dodoma.

At the household level, 90% of women reported increased involvement in decision-making concerning consumption, saving and budgeting. They are perceived as more responsible than their husbands in managing money and more likely to spend on items that benefit the entire family such as food, education, healthcare and investments with financial returns. More than half of couples interviewed (69%) reported they make joint household decisions, increasing women's access to and use of resources and assets. These assets include land, livestock, farming tools, grains, etc. For women in two villages (Bankolo and Makanda), inheritance traditions limit or prevent women and girls from having control of assets. Participants believe this can change over time through sensitization and shifts in gender norms.

Figure 8





90%

of women reported increased involvement in decision-making concerning consumption, saving and budgeting



Women are perceived as more likely than their husbands to spend on items that benefit the entire family such as:

Food

Education

Heatlhcare

Investments with financial returns



Women discussing and empowering one another on matters related to GBV, decision-makingand work load burden of women in Mnkola Village, 2021.

Figure 9

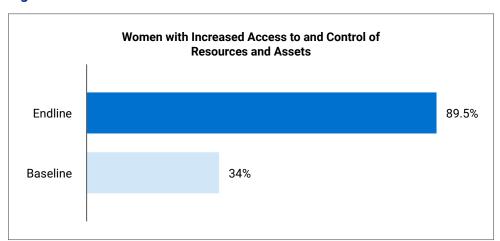
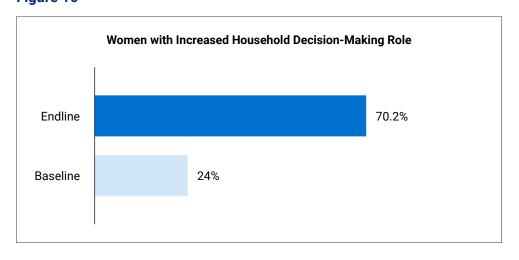


Figure 10





69%

of couples interviewed reported they make joint household decisions, increasing women's access to and use of resources and assets

"As a result of awareness raising and training on gender issues promoted by the program, I have equally divided land between my wife and children) both girls and boys."

Male Participant, Bankolo Village



Water supply protected in a pump house. Dodoma, Tanzania, 2023.

# Objective 5 Improved access, supply and availability of clean and safe water

More families have access to clean and safe water since the start of the program. Over 70% of households reported having access to at least one improved drinking source year-round compared to 26% at baseline. With the increasing number of water sources, households' travel time to fetch water also reduced to less than 30 minutes, which lessens the burden on women and girls who are traditionally responsible for this task. These gains can be attributed to the program's coordinated effort with the government, local community leaders, WASH committees and community-based water supply organizations (CBWSOs) to construct and repair water sources and distribution points.

"I'm delighted with this program. It has improved water availability, reducing the workload for woman and girls who usually fetch water."

### Focus Group Discussion Participant

"I wish that the service of water supply continues to reach our homes and other sub-villages. This will greatly relieve women and girls the burden of carrying water on their heads."

Woman Focus Group Discussion Participant

Figure 11

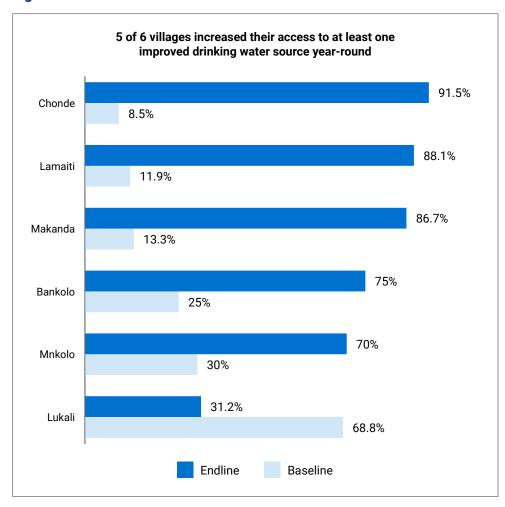
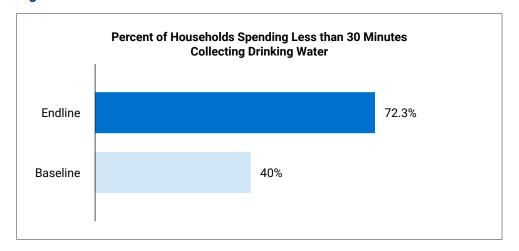


Figure 12





#### **Over 70%**

of households reported having access to at least one improved drinking source year-round compared to 26% at baseline

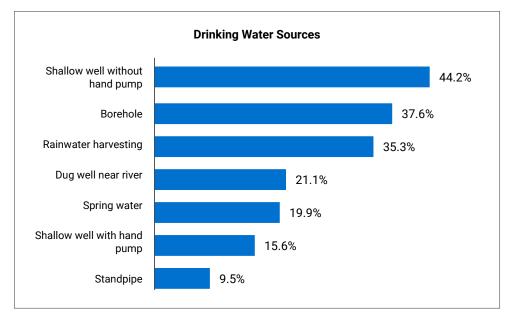
**72%** 

of households spent less than 30 minutes collecting drinking water compared to 40% at baseline

"Precautions [people are taking] to reduce these diseases include boiling drinking water, hand washing with soap after using the toilet, proper dish washing, washing fruits."

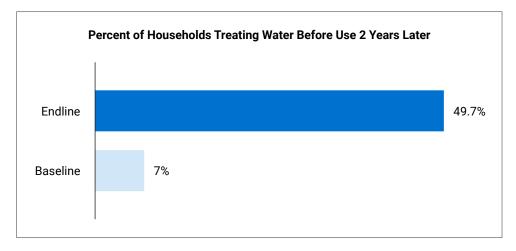
Focus Group Discussion
Participant,
Nhome Village

Figure 13



Participants in focus group discussions reported a decrease in cases of water-borne diseases such as cholera, typhoid and dysentery after learning about water, sanitation and hygiene (WASH) practices from the program's WASH committees. This was not complemented with quantitative findings on disease reduction. Thought quantitative data shows that 50% of households treated the water before use two years after receiving the training, compared to 4% at baseline. However, more education and training are needed to reinforce WASH practices, specifically on treating water<sup>5</sup> when sourced from shallow wells, boreholes and rainwater.

Figure 14





**50%** 

of households treated the water before use two years after receiving the training, compared to 4% at baseline

"There were serious outbreaks of diseases like cholera and dysentery, but now there has been a significant reduction of diseases such as typhoid and cholera."

# Focus Group Discussion Participant, Nhome Village

"Precautions undertaken to reduce these diseases included: boiling drinking water, hand washing with soap after using the toilet, proper dish washing, washing fruits."

# Focus Group Discussion Participant, Nhome Village



The Tuinuane ("Let Us Lift Each Other" in Swahili) Savings with Education group in Bankolo Village produces and sells honey together after being trained and equipped with materials by the project.

4

### Building on Progress Key Lessons Learned



### Importance of integration

Food insecurity, water scarcity, inequality and economic instability are interrelated. Addressing them separately can lead to fragmented solutions that fail to tackle root causes. DCT-DSC's integrated approach to building climate resilience in their communities addresses the interconnected nature of the challenges they face in a changing climate. It enhances resilience through diversified strategies, ensures sustainable development, promotes gender equity and fosters community ownership. The program will continue to build on its integrated program model and expand its collaboration with local stakeholders in government, the community, the private sector, non-governmental organization and faith leaders.



#### Focusing on livelihood diversification

Farmers are practicing conservation agriculture, but on average they are limiting it to just .5 acres of their farms. The time and labor investments associated with CA techniques (i.e. minimum tillage, weeding, keeping crop residue, intercropping, planting stations), especially in the first 1-2 years of application, are greater than traditional farming practices. These relatively small plots, albeit with higher yields than traditional farming (as evaluation shows), limits overall impact on food security. While access to climate adaptive technology, such as rippers and improved seeds, aids in overall efficiencies, there are barriers to access. The program has simultaneously invested in the promotion of such farm productivity-focused interventions as well as in non-staple crop and off-farm opportunities. Considering demographic pressures (reducing access to land), increasingly uncertain rainfall, the drudgery of farming and people's evolving livelihood preferences, supporting farmers and others' access to capital for flexible decision-making remains important.



#### Increasing loan sizes for borrowers through the Revolving Loan Fund

Towards the end of the evaluation period, through Episcopal Relief & Development's innovation grant initiative<sup>6</sup> (and therefore not evaluated in this endline), DCT-DSC piloted a revolving loan fund that mature SwE groups could access in order to take larger loans. SwE groups that are over two years old, demonstrate strong accountability and recordkeeping and use digital technology to make transactions are eligible for these loans. Larger loan sizes enable members to undertake more significant economic activities, such as expanding small businesses or investing in agricultural improvements. This can lead to increased income and economic growth within the community. The pilot was to test this hypothesis and to replenish dwindling SwE funds as COVID-19 impacted livelihoods and SwE members' ability to save. By the end of the 12-month pilot, borrowers had repaid their loans with interest on time and saw an increase in their business profit margins. The loan was such a success that SwE members requested for double the piloted loan amount for the following year. Based on an initial assessment, the team identified the following initial results and learnings:

- 1 Yield on investments. Borrowers reported higher business profits after receiving the large loans. 56% have used the higher profits to expand their new business.
- **2 Borrower's ability to repay large loans.** Borrowers proved they are capable of repaying a large loan and can benefit from a larger sum. The average loan size per borrower ranged from \$81 to \$147 with 43% of loans reinvested into their business.
- 3 Impact of loans for borrowers. Loans helped borrowers cope with inflation and cover cost for basic household needs such as school fees and health care expenses thanks to higher loans and expanded business profits.

### Conclusion

From this evaluation, other primary sources and secondary research, several strategic priorities have been validated. Investments in SwE and access to larger loans; livelihood diversification via dry season horticulture and other income generation activities; and collaboration with government for sustainable water access and management are integral for rural households' adaptation and resilience to drought and other crises. Building livelihood programs into community-led, cohesive and accountable collectives, such as SwE groups, allows synergistic effects of access to credit, adoption of improved agricultural practice and inputs and livelihood diversification. Beyond changes in on- and off-farm livelihood practices, quantifiable changes in livelihood investments and income or expenditures need to be measured in order to show meaningful improvements in economic resilience. Other quantitative and

qualitative measures of resilience should be tested as well. The evaluation also helped reveal strategic gaps and intervention areas that need more exploration and piloting. For example, youth livelihoods in rural and urban settings (as they migrate in search of work) must be considered as future generations will be most impacted by climate change, but have fewer opportunities in traditional livelihoods, like smallholder farming. As rainfall becomes more erratic - less frequent but more at once - water catchment via household rainwater harvesting, sand dams and holding ponds will be useful. In addition to testing new interventions, field research, such as process evaluations, to understand the effectiveness of the sequence and layering of interventions, will aid in ongoing efforts towards integrated, multisector approaches.

### **End notes**

- <sup>1</sup> Villages include: Lamaiti, Mnkola, Bankolo, Lukali, Chonde and Makanda.
- <sup>2</sup> Some examples of climate-smart technologies include spot application of ash (liming) and manure, improved seeds/drought-tolerant seeds, planting trees to reduce erosion, etc.
- <sup>3</sup> Conservation Agriculture definition from Food and Agriculture Organization.
- <sup>4</sup> Training topics include decision-making, access to and control of resources, gender roles within the household, etc.
- <sup>5</sup> Water treatment methods include boiling, sunlight, filtration and adding local herbs.
- <sup>6</sup> The purpose of Episcopal Relief & Development's innovation grant is to rapidly test and learn from new programmatic strategies that could provide greater impact in communities where we work.

