THE SUSTAINABLE LIFESTYLES AMONG RURAL FAMILIES IN ZIMBABWE: SMALL SCALE CONSERVATION FARMING TO CHANGE LIFESTYLES IN AFRICA AND BEYOND

END OF PROJECT EVALUATION REPORT

By

SALIT Saving Livelihoods Team
Utilizing Local Potential For Sustainable Livelihoods and Investment

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Acronyms and Abbreviations

Agritex	Agriculture Extension Services
BVIP	Blair Ventilated Improved Pit
CC	Climate Change
DA	District Administrator
DAPP	Development Aid from People to People
DCPC	District Civil Protection Committee
DWSSC	District Water and Sanitation Sub-Committee
EWM	Early Warning Message
EWS	Early Warning System
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
GoZ	Government of Zimbabwe
Hh	Household
HHs	Households
KII	Key Informant Interview
LPD	Livestock Production Department
PA	Provincial Administrator
PPS	Probability Proportional to Size
RDC	Rural District Council
SALIT	Saving Livelihoods Team
TTL	Tribal Trust Land
UNEP	United Nations Environmental Programme
WASH	Water Supply Sanitation and Hygiene
ZimAsset	Zimbabwe Agenda for Sustainable Socio-economic Transformation
ZimStat	Zimbabwe Statistical Agency
ZimVAC	Zimbabwe Vulnerability Assessment Committee

Executive Summary

Development Aid from People to People (DAPP), with funding assistance from United nations Environmental Programme (UNEP) implemented a two year project titled, *'Sustainable Lifestyles among rural families in Zimbabwe: Small-scale conservation farming to change lifestyles in Africa and beyond'*. The project, running from February 2017 to December 2018, was being implemented in Manicaland Province (Mutasa District) and Masvingo Province (Gutu District). The project aim to promote and replicate sustainable farming, adaptation and mitigation to climate change for families living in the rural areas in Zimbabwe. DAPP commissioned Saving Livelihoods Team (SALIT) to conduct an end of project evaluation. The evaluation was conducted in Gutu and Mutasa Districts between November and December 2018. The purpose of the survey was to assess achievements of the project against set objectives as well as the effectiveness, efficiency, impact and sustainability of the strategies used.

Project Outputs

The project aimed to respond to food insecurity and climate change impact through four interlinked outputs:

1. Improved agricultural and climate smart production/consumption systems are applied by 2,000 farmers;
2. Family income and livelihood options improved for 2,000 families through crop production, agro-processing and market linkages;
3. Dietary diversity and general health improved by the targeted 2,000 farmers; and
4. Project goals, lessons learned, results disseminated widely.

Project Outcome

The project's main outcome was that sustainable farming, adaptation and mitigation to climate change and living in the rural areas in Zimbabwe are promoted and replicated.

Geographical Coverage of the Project

The project will be implemented in a total of five wards (three wards in Gutu and two wards of Mutasa Districts). The project targets 2000 small scale farmers, 1000 from Gutu and 1000 from Mutasa District.

Purpose of the Final Evaluation

This final evaluation examined the impact of activities undertaken by DAPP Zimbabwe in relation to the objectives of the project as set out in the project description approved by UNEP. The evaluation provided an opportunity for many project stakeholders to critically reflect on the activities and approaches undertaken, project successes and challenges, and goals met or not met. It is envisaged that the evaluation inform UNEP of the grantee's performance at the project level as well as other would-be potential implementers of sustainable farming projects in future.

KEY RESEARCH FINDINGS

Demographics Profiles of Households (Hhs)

Gender of the Respondents: A representative sample of 364 out of the 2000 beneficiaries' households were interviewed from both districts in this end-line evaluation, majority (70%) of the interviewees were female and the remainder (30%) were male. The project exceeded the targeted of sixty percent female beneficiaries.

Head of Household: Half of the respondents were the farmers in the DAPP-UNEP Project, of these farmers 32% were heads of their households while the remaining 18% were not about 50%, who do not head their respective households. The other 50% were both farmers and household Heads.

Marital Status: Most of the respondents (59%) were married or living with their spouses. Almost a third (29%) were widowed. Gutu had more windowed interviewees (33%) and Mutasa had 25%. Mutasa had a higher number (65%) of those married and living together while Gutu had slightly above half (55%) of the farmer interviewed living together. 8% were married or living apart. Of these, more were among those interviewed in Mutasa (10%) than those from Gutu (6%). 3% were either separated or divorced and of these more were from Gutu (5%) than those from Mutasa (2%).

Distribution of Household Member by Gender: The responses collated from the survey data show that the average household size had six hh members[1] (88%) and only 12% of HH had households that had more than 7 people. Both Genders were equally distributed evenly with 96% of the households having an equal number of males and females.

Religion: Less than half (39%) of the interviewed farmers belonged to mainline churches, and 38% belonged to apostolic sect while 19% were Pentecostal and 2% were traditional believers. Religion can aid or hinder farming practices.

Economic Status

Arable Land Owned: Less than half (40%) of the farmers interviewed across the project districts owned (0.5 to 1ha)., 20% owned less than 0.5ha and another 20% owned between 1.5ha and 2ha. 13% owned between 1ha and 1.5ha Only 6% owned between 2ha and 4ha. Close to half (48%) of the farmers interviewed in Mutasa owned between 0.5 and 1ha, 30% had less than 0.5ha; 13% had between 1ha and 1,5 while 6% owned from 1.5ha to 2ha and only 4% owned from 2ha to 4ha and none owned above 4ha. In Gutu 35% of the farmers interviewed owned between 1.5 and 2ha; while 31% owned between 0.5ha and 1ha. 14% owned between 1ha and 1.5ha. 8% owned between 2 and 4ha and 1% owned between 4ha and 6ha. Farmers from Mutasa had smaller pieces of land than their counter

Livestock Owned: Almost all interviewed hh keep chicken (96%) while above half (57%) keep goats; 44% keep cattle and 18% keep turkeys. In most cases, interviewed farmers from Gutu kept more cattle, goats, turkey except for rabbits or ducks.

[1] HH members referred to those people who lived, cooked together within 30 days prior the survey whether or not they were related by blood.

*Sources Household Income and Expenditure**:*** Most interviewed farmers (60%) earned incomes from sell on either crop sales. 38% earned through casual labor, 15% through pensions, 14% through salaries, 9% through remittances. Very few earnt money through trading or other means.

Household Income: about half of the hh interviewed (51%) earned S$2/day while 41% earned between US$2 to US$5/day. Farmers spent most of their income on food and education.

Household Expenditure: less than half of the interviewed farmers (48%) spent US$2/day, while 44% spent between US$2 and US$5 and 6 % spent above US$5.

Spending patens: Majority (92%) of the interviewed farmers spent their income on buying food, while 36% education, 32% on buying soap 12% on health treatment, 7% on inputs and 4% on clothing.

Home appliances owned: Almost all of the hh owned cellphones (95%), while 55% owned radios; 21% owned television sets which are mostly powered by solar and 5% owned refrigerators. Majority of the farmers have own vegetable gardens.

Source of power: Most hh interviewed (63%) used solar power for home appliances while 18% use batteries/generators and 8% of used electricity. None among those interviewed in Gutu used electricity. They have no refrigerators to preserve perishable food. Therefore, natural and traditional preservation methods such as sun drying encouraged by the project were appropriate.

Power over Assets: Power to make decisions over assets lied mostly (52%) with both husband, 20% wives only had power, 16% parents and children and 12% husband only. Married men had less power. The project empowered women with decision making power when compared to endline situation where women had less power.

Durable Assets Owned: Most (71%) of the interviewed hh owned gardens; 51% owned wheel barrows, 23% bicycles, 14% ox drawn cuts; 12% watch; 8% cars; 6% motor cycle. In most cases farmers in Mutasa owned more assets than their counterparts in Gutu except for ox-drawn carts only.

Fuel Used: Almost all farmers interviewed (98%) used firewood for fuel, and 1% used electricity. None among those from Gutu used electricity. Poverty causes land degradation, and vice versa. While most hh still use conventional wood stoves, a good number of farmers adopted the climate smart tsotso stove promoted by the project.

WASH

Source of Drinking Water: The Most commonly used source of water by interviewed hh are protected wells (37%), tube well borehole (28%) and unprotected well (20%). Piped water and spring, rope and washer are some of the sources minimally used mostly in Mutasa. It was worrying to note that farmers still consumed water from unsafe sources. Most of the water sources (41%) were installed by family followed by DDF (34%), some 8% by community, others by neighbors (6%), NGOs (5%) while DAPP installed 4% of them.

Location of Source of Water: Less than half (51%) of the sources were reportedly located away from the farmers' dwelling place while 21% were in the farmers' yard, 13% in the community, 6% in the dwellings and another 6% at the neighbors.

Distance to water source: Most the sources (40%) were within 200m, while 26% were between 401 and 601m, 11% were between 201 and 400 and some (3%) were between 1km and 2km.

Time taken: About half of the sources took 15 to 30 mins to fetch water, while 44% took less than 15mins and 4% took more than hour.

Type of Sanitation Facility: A quarter (25%) of the hh used pit latrine with slab while 20% used BVIP, 15% upgradable and 11% practiced open defecation. Only 10% constructed facility as result of DAPP Project education.

Handwashing: Most farmers (97%) washed hands before eating and after cooking while 53% farmers interviewed reported washing hands before cooking, 4% washed before breast feeding and while 1% after changing nappies and another 1% didn't wash a hands at all. Hand washing practice was high since not all the hh had babies.

Handwashing method practiced: Above half (61%) of the interviewed farmers practiced run to waste with water only, 15% communal dish water and soap, 12% communal dish with water only. Farmers still practiced unsafe handwashing was still low.

Open Defecation: In Mutasa there was 1% likelihood of men and women, boys and girl to practice OD while in Gutu, 22% likelihood for men and women and 31% likelihood for boys and girls to practice OD.

Observations on Sanitation: Only 21% of the interviewed hh had dishrack, rubbish pit and tippy tap. Of these 31% were among those from Mutasa and 12% among those in Gutu.

OUTPUT A: AGRICULTURAL AND CLIMATE SMART PRODUCTION/CONSUMPTION SYSTEMS

CROPS GROWN

Most interviewed farmers grew two cereals maize (97%) and Rapoko (23%); legumes grown ground nuts (51%) and round nuts (33%); Pulses: Sugar beans (34%) and cow peas (7%) as well as sweet potatoes (34%). Sorghum, tobacco, cotton, soya beans, sunflower and millet were not grown by interviewed farmers. However, during FGDs some farmers in Gutu reported growing millet albeit in small quantities. Government.

Area Planted:
Maize: In 2017 season most of the interviewed farmers (66%) grew maize on 0.5-1ha plots, 24% grew maize on less than 0.5ha and 8% grew it on between 1ha and 1.5ha and only 1% grew it on between 1,5ha and 2ha. In the 2018 Season, 59% of the interviewed farmers planted maize on land between 0.5ha and 1 ha of land. 34% of the farmers planted on land less than 0.5ha and 7% planted on plots of 1ha to 1.5ha in size.

*Rapoko***:** Most of the interviewed farmers that grew rapoko in the 2017 and 2018 season (85% and 97% respectively) planted on less than half a hectare of land. Only 15% in 2017 and 3 % in 2018 planted an area over half an hectare to a hectare.

Legumes: Most of the farming for legumes (groundnuts and round nuts) was done on less than half a hectare by 95% of the farmers interviewed in both the 2017 and 2018 Seasons. Only a few, 2% of the interviewed farmers grew round nuts on more than 0.5ha to 1ha of land. For groundnuts, only 5 % of the farmers in both the 2017 and 2018 season planted more than half a hectare.

Pulses: Most cropping for pulses (95%) was done on less than half a hectare in both seasons. The farming was done on area over half a hectare, in the case of Cow peas more popular in Gutu that in Mutasa, by only 5% of the farmers in the 2017 farming season. Conversely, for Sugar beans, more popular in Mutasa than Gutu, 5% of the farmers also planted on more than half a hectare of land.

Amount of seed used: Most of the cropping was done with less than 10kg of seed with the exception of maize, for which the amount of seed used ranged from 10 to 40kg. Seventy three percent of the interviewed farmers in Gutu and 71% of those interviewed in Mutasa used between 10-25kg of maize seed.

Cereals

Maize: About Forty two percent (42%) of the interviewed hh planted less than 10kgs of maize seed while 46% planted between 11 and 20kgs of maize seed. Of those who planted less than 10kgs, 51% are of those interviewed in Mutasa and 34% of those interviewed in Gutu. For those that planted 11 to 20kgs of seed, 47% are hh interviewed in Mutasa and 45% interviewed in Gutu. Of all interviewed hh only 12% used over 20kgs. Maize is still the dominant crop grown by farmers from both districts despite farmers realizing that failure rate was increasing. There was no much change in seed quantity planted between 2016/17 to 2017/18 farming seasons.

Rapoko: In both districts, most farmers (77%) do not grow Rapoko. 85 % of the farmers that grew rapoko planted seed between 1 and 2kgs. Of those who planted 1-2kgs, 80% were among those interviewed in Mutasa and 85 % were among those interviewed in Gutu. Other small grain cereal crops like sorghum and millet were not grown among the interviewed farmers in both districts.

Legumes

Ground Nuts: Most interviewed hh (83%) planted 1 to 10kgs of seed, followed by 16% who planted 11-20kg; only 1% planted above 20kg. Generally, farmers in Gutu planted more seed than those in Mutasa. The amounts of seeds grown did not increase much between 2016/17 season and 2017/2018 season.

Round Nuts: Ninety seven percent of surveyed hh who grow round nuts used less than 10kgs of seed while 3% percent planted between over 10kgs. 97% of those interviewed in Gutu and 100% of those interviewed in Mutasa.

Pulses

Cow peas: All of the surveyed hh who grew cow peas, they used less than 5kg of seed in both the 2016/17 and 2017/18 seasons.

Sugar Beans: Over 80% of the interviewed farmers who grow sugar beans sowed 1 to 10kgs of seed. Twenty percent of the farmers planted more than 10kg of seed in both Districts.

Source of Seeds Planted
Cereals
Maize: The interviewed farmers indicated that their first major Source of Seed for maize production is by own purchase followed by Government support. Of the interviewed farmers who grow maize, 66% indicated that they purchased their own seeds and used between US$11 and US$50. Fifty-seven percent of the farmers also indicated that they receive seeds from Government. A few farmers, 12% in Gutu and 18% in Mutasa utilised seed carryover from the previous farming season.

Rapoko: 90% seed for rapoko production is from carryovers from the previous season. The remaining 10% consists of support from the DAPP-UNEP Programme (5%) and the other five percent is from sharing among relatives in the rural areas.

All the legumes and pulses seeds used for production were from carryover from the previous seasons. These seeds were more resilient to pests and diseases therefore they were easily kept.

Source of Water for Agriculture Production: All crop production (99.9%) in project wards was rain-fed with the exception of three farmers two from Gutu and another one from Mutasa who occasionally used irrigation for their maize production. In Mutasa, there were perennial springs in Mutasa where farmers would just connect pipes and get water for irrigation using force of gravity. Rainwater harvesting must be encouraged to assist farmers setting up small scale irrigation schemes particularly drip irrigation**.**

Fertilizer Used: Synthetic fertilizers were the most (91%) commonly used fertilizers in maize production, 85% in Mutasa and 91% in Gutu. A close second were inorganic fertilizers compost and animal manure. Slightly above half (53%) of the farmers also reported using compost manure in maize production. Of the 53%, manure was used most in Mutasa with 83% as compared to 23% in Gutu. About 35% of the interviewed farmers used animal manure/slurry close to half of whom were from Gutu (48%) while 23% were among those interviewed in Mutasa.

Fertilizer Source: Most interviewed farmers (74%) indicated that they purchased synthetic fertilizers which they used. Of these, the 74%, more (77%) were from Gutu and 70% in Mutasa. Over half (61%) of the farmers used between 22 and 100kgs of fertilizer. In this bracket, 88% were from Gutu and 34% Mutasa. 37% of the farmers used more than 100kg of fertilizer. Of the 37%, 64% were from Mutasa and only 7% from Gutu.

Crop Yields, Cereals:
Maize : In 2017, above half (55%) of the interviewed farmers produced maize above half a ton but below 2t while 40% produced below 1/2t and only 5% produced above 2t. This year the maize yields realized by farmers in the project were almost similar to those of last year with a difference of 1% increase for farmers who produced 1/2t to 2t (table_2017/18).

Rapoko Yields: Close to half (49%) of the interviewed farmers produced between 300kg and 500kg of rapoko while 39% produced less than 100kgs; 5% produced 1/2t to below 900kg, 1% produced 700kg to 800kg and another 1% produced over a tone of rapoko. This year the same almost half of farmers (49%) produced between 100kg to 299kgs while 39% produced less than a 100kgs; 17% produced between 200 and 300kgs and 5 % produced above 300kgs.

CA Methods Practiced per Crop

Reported farming practices per crop between 2017 and 2018 agriculture season were either conservation, conventional or mixed methods. CA practices decreased slightly across all grown crops between the two seasons. While conventional practices also decreased for cereals and legumes only and increased slightly for pulses between the two seasons under review. Mixed farming methods increased per crop for cereals and legumes for the periods under review.

According to FGDs and KIIs farmers were trained in the following CA methods among others:

i. Zero tillage methods both manual and mechanized ie potholing and use of riper tines
ii. Contour ploughing
iii. Compost making
iv. Mulching
v. Agro-forestry
vi. Afforestation and reforestation through planting of new trees, grafting and budding
vii. Crop rotation
viii. Intercropping

Farmers who participated in FGDs demonstrated sufficient knowledge as well demonstrated skills through existing demonstration plots as well as prepared individual fields visited by researchers during field work. Those interviewed were able to explain CA principles as well benefits derived both for sustainable human life as well for the environment. An album of picture from the field will be attached to the report.

Crop Yields and Usage Crop Sales,
Cereals

Maize: Most interviewed farmers (72%) did not sell any maize both in the 2016/7 and 2017/8 Seasons. Of the remaining 28% who sold produce, 17% sold less than half a ton, 7% sold between 500kg to a ton and only 4% sold more than a ton.

Most of the responding farmers (44%) sold their crops in their local community. From this 44%, 48% were from Gutu and 44% in Mutasa. 31% of the interviewed farmers sold their maize through the Grain Marketing Board – 44% in Gutu and 18% in Mutasa. 23% sold their crops in the local market place. Of which more came from Mutasa 35% and fewer from Gutu (10%). The selling price varies from $0.10/kg to $0.50/kg. 22% of the farmers that sold their crops sold for in a price range between $0.19/kg and $0.29/kg. About 11% sold between $0.29 and the official GMB Price of $0.39.

Rapoko: Most rapoko gorwers (74%) among farmers who were interviewed the very few farmers did not sell. Among these 76% were from those interviewed in Gutu whikle 67% were from those interviewed in Mutasa. 11% sold more than 100kgs – most of which came from Gutu (13%) and a few from Mutasa (5%). Of the sales made the price ranged between $0.30 and $0.75/kg. The main market for rapoko stated by the interviewed farmers was the local community. The crop sales and prices did not vary across the two farming seasons under review (2016/7 and 2017/8).

Legumes
*Groundnuts***:** 90% of the farmers who grow groundnuts did not sell any groundnuts in both farming seasons under review. The few (10%) who sold legume sold between 10 and 100kg for a price between $0.30 to a $1.00 for a kg.

*Roundnuts***:** Most **(**90%) of the interviewed farmers did not sell any round nuts. Of the 10% who sold, charged $0.20/kg to $0.70/kg and sold quantities between 15 and 200kg.

Pulses
Cow peas: About a quarter of farmers (26%) among those interviewed grew cow peas and none recorded any sales. Among these 69% growers from Gutu.

Sugar Beans: 35% of the interviewed farmers grew sugar beans, most of these (96%) of the farmers that grow Sugar Beans were from Mutasa District. From this number, only 31 percent sold sugar beans.

*Surplus for Sell as result of DAPP-UNEP Intervention**:*** Farmers that had surplus agricultural produce to sell were asked if their success was a result of the DAPP-UNEP Intervention. Of the few farmers interviewed that recorded a surplus at least 50% across the 3 crop categories attributed their increase in productivity to the Project. Specifically, the farmers noted that the skills acquired through the training received from the DAPP-UNEP project had been instrumental in improving their farming.

For some farmers it was the inputs support that had been rendered by the Project or accessed from seed houses facilitated by the project improved their productive capacity. Yet for other farmer it was the prospect of money which motivated as they learnt about accessing markets for their agricultural produce.

Type of Extension Services Offered by Government Departments: Of the government provided extension services most were crop production (99%), followed by livestock production 49% then veterinary services (14%) and irrigation department (4%). Some of these agriculture departments have been underfunded which made them very too weak to support rural farmers.

Crop Production Extension Services: Most farmers (91%) interviewed had received extension services within 3 months preceding evaluation, while 7% had last received more than six months prior to the evaluation. Only 3% received services between three to six months before the evaluation.

Service Providers: Most farmers interviewed reported receiving 90% extension services from Agritex, 69% from DAPP-Officers, 5% from veterinary services and 1% each from LPD and private sector respectively. FGDs with farmers and KII with key stakeholder officials indicated that DAPP officer were most available to the groups than Agritex extension workers. This was acknowledged also by some of the Government officials.

Livestock Production

Cattle owned: Over half of the interviewed farmers (57%) owned 1 or no cattle at all while 28% owned from one to 5 five beasts and 11% owned between 6 and 10. Only 4% owned more than

11. Generally, farmers from Gutu District owned more cattle as compared to their Mutasa counterparts.

Most of the interviewed farmers (74%) did not have any increase in their heads in the 12 months preceding the evaluation while the remainder (23%) had increase in cattle. Most of the cattle increases (95%) were due to births while 5% were to purchases. The increases were more in Gutu than in Mutasa. Attrition: For most of the interviewed (89%) there was no attrition while 11% there was mostly due to deaths followed by slaughter.

Most cattle (99%) in both districts were on free range. A few of the interviewed farmers (8%) experienced cattle deaths. Most of the interviewed farmers (77%) had last received livestock extension services within three months preceding the evaluation. Only 20% had not received extension services for over 6 months. Most of the extension services were provided by LPD together followed by DAPP-UNEP project staff.

According to interviewed farmers most cattle (94%) did not have water during the last drought season only 6% had access to water. Most of these cattle (81%) accessed water from the rivers, communal dam, (5%), spring (4%), or borehole 3%. Cattle water was a challenge for rural farmers. Very few farmers (2%) had sold any cattle by the time of the evaluation. The sales were made to private individuals. In most cases cattle buyers were reportedly coming to buy direct from the farmers.

Most of the interviewed farmers (85%) kept chicken, only 15% sold some of their chicken to neighbors. A few of the farmers (2%) sold rabbits to neighbors, the rest did not keep nor sell.

Most interviewed farmers (61%) had received training in livestock management while 39% had not.

Of those who received training over half had training in animal health, while 29% were trained in feeding and 26% in breeding. Most of those trained in animal health were from Gutu while most of those who had training in breeding nutrition were from Mutasa. Only 1% had training on grazeland management.

Fodder/Pasture Production
A few (8%) of the farmer interviewed grew hey grass majority did not.

Aquaculture Production: Very few of the interviewed farmers (less than 2%) practiced aquaculture. These got the skills from GoZ extension workers and they bred breams. Little was sold.

OUTPUT B: FAMILY INCOME AND LIVELIHOOD OPTIONS IMPROVED FOR 2000 FAMILIES THROUGH CROP PRODUCTION, AGRO-PROCESSING AND MARKET LINKAGES

Current Livelihoods Options

Crop Products Processing

Very few of the interviewed farmers processed agriculture products before sale, eg ground nuts into peanut butter and sold to local market as well roast nuts

Slightly above half (51%) of the interviewed farmers received training in food processing. The training was facilitated by GoZ extension workers together with DAPP (80%) and DAPP only (18%). Farmers viewed the training as very helpful (56%) and helpful 44%. Only 20% reported to have access to markets as result of training from DAPP. Most interviewed farmers reported lack of access to good markets while 20% reported lack of market knowledge. And 10% lacked equipment and materials for co instruction of material data. The most common markets for local produce was still local market.

Livestock Products Processing

Most (84%) interviewed farmers did not receive any training in livestock products processing. 15% did receive from either DAPP or GoZ. The skills acquired through DAPP trainings included, breeding, hatching and slaughtering. Most of the farmers still did not have access to good markets save for few (8%). Local markets were the most relied on for agriculture produce.

Horticulture Production

Garden Sizes and Assistance: Most farmers interviewed (77%) grew vegetables on garden less than half a hectare in size while 22% had gardens between 1/2ha and 1ha. Only 1% had more than 1ha size of garden. Most of the farmers (72%) reported receiving assistance mostly from DAPP and Government.

Vegetable groups trained to grow: Most interviewed farmers (72%) reported that they were trained to grow leaf vegetable while 24% were trained in root vegetables and only 4% in fruit vegetables.

Interviewed farmers grew the following root vegetables: carrot, onion sweet potatoes. Most farmers produced carrot (60%), while half of them (51%) grew onions; a few grew sweet potatoes. According to FGDs participants DAPP introduced beetroot and cassava and taught farmers how to prepare and eat it. At first, farmers reported to have resisted these new varieties but later adopted them.

Leaf Vegetables: Most interviewed farmers reported growing traditional leaf vegetables such as covo (68%), rape (41%), tsunga (19%). DAPP introduced spinach (44%), lattuce, broccoli and cabbages (according to FGDs).

Fruit vegetables. Interviewed farmers used to grow tomatoes only but DAPP introduced butternuts (30%), cucumbers (4%), green beans 3%), paper and okra which were slowly adopted at first

Vegetable Varieties Grown

The majority of interviewed farmers all grow covo (68%). From the 68%, more were from Gutu with 88% and 49% from Gutu. The second most popular vegetable was carrot which is grown by 60% of the farmers followed by Onion, Spinach and Rape which are grown by 51%, 44% and 41% respectively. The least popular among the vegetables were tomatoes at 34.4%, Pumpkins at 30%, tsunga at 19% and the bottom being Cucumbers and Green Beans which were grown by 4 and 3 percent of the farmers respectively.

Size of Garden: The Gardens of the majority interviewed farmers ranged in size between 0.1 and 0.5 ha for all the vegetable groupings. Less than five percent of the interviewed farmers used gardens over 0.5ha.

Fertilizer Use: Most of the farmers in horticultural production used compost manure as the preferred fertilizer. The farmers that applied mostly compost manure across the different vegetable groups. The farmers approx. 67% utilized between 2kg and 2,5kg per square meter.

Horticulture Yields

Source of Water for Crops: Most interviewed farmers (73%) did not irrigate their horticulture crops. Over a quarter irrigated (27%). Of these most were among those interviewed in Mutasa (53%) and less than 1%from Gutu.

Quantity Consumed: 64% of all Horticulture Produced is consumed by the hh. This figure is constant across all horticultural varieties (Root, Leafy and Fruit Vegetables). From the 64% slightly more were from Mutasa (69%) and (58%) for Gutu. After subsistence, the interviewed farmers had a 37% surplus yield available for sale, processing or preservation, that is, 34% surplus for Mutasa and 38% for Gutu.

Quantity Sold: 95% of Surplus Horticultural produce was sold. Of the 94%, more surplus was sold in Gutu (100%) and (95%) in Mutasa. The average price across the horticultural varieties is $0.54kg

Income Realized from Horticulture: For the interviewed farmers, approximately $6,100.00 was realized in the two target Districts. This translates to an income realization of $17 for a single cycle of Horticultural production.

Agro Forestry and Fruit Production: Most of the interviewed farmers (69%) use only 10% of their land for fruit production, while, 28% said do not use any of their land for fruit production. Only 3% use between 10 and 30 % of land for fruit production. Less than a 1 percent utilize 30 to 50% of their land for fruit production.

Fruit Varieties Grown: The Interviewed farmers grow 11 varieties of fruit trees across the two Districts. More than half of the interviewed Farmers (54%) indicated that they started to grow mangoes as a result of the DAPP-UNEP Project. From the mentioned 54%, More were from Mutasa (71%) and less were from Gutu (36%). About a third of the interviewed farmers indicated that they now grow Citrus fruits as a result of the project (42% from Gutu and 20% from Mutasa). Only 21% of the farmers indicated that they had grown Apples as a result of the Project. Of which, more were from Mutasa 33% and only 9% were from Gutu. About 10% of the Farmers grew Avocados, 13% from Mutasa and 7% from Gutu. Only 7% of the interviewed started Banana production as a result of the project. Of the 7%, 9% are from Mutasa and 5% are from Gutu. 5% of the farmers grew peaches and of the 5%, 7% were from Mutasa and 4% from Gutu. Only 1% of the famers grew Paw paw, Macadamia Nuts, Pineapples, guavas and plums.

Wood Production: More than half (60%) of the farmers interviewed practiced wood production and 40% do not. Of the famers that practice forestry/wood production almost two thirds were trained through both DAPP-UNEP and the Government. The remaining one third was trained by DAPP-UNEP only. 95% of the wood producers grow the Eucalyptus variety and the remaining 5% are distributed evenly among the wattle and mahogany variety. All of tree production is practiced on less than half a hectare of land.

Wood Processing: Of the farmers that practice wood production, only 23% received training in wood processing most of them (85%) were trained by both Government and DAPP-UNEP, 6% were trained by DAPP-UNEP only and 1% by the Government of Zimbabwe.

Green House Gas Reduction: Half of the interviewed farmers indicated that they had been trained in green house emission reduction. Of the farmers that were trained, half were trained by DAPP-UNEP alone and slightly below half were trained by both DAPP-UNEP and the Government and only 2% had been trained by the Government alone.

OUTPUT C: DIETARY DIVERSITY AND GENERAL HEALTH IMPROVED BY TARGETED 2000 PEOPLE

Main Source of Food: More than 80% of the interviewed farmers indicated that their own crops were the major source of food. The remaining Farmers indicated that they purchased food, practiced barter trade, received food aid and some made payments for food in kind.

Most hh (72%) indicated that they had been able to provide enough food to hh members before June, 2018. Of the 72%, most where from those interviewed in Mutasa 98%, and 46% were from those interviewed in Gutu. Farmers in Gutu were less food secure than those in Mutasa. 54% of the farmers interviewed from Gutu indicated that they did not have enough food before in June 2018.

Almost all interviewed farmers indicated that they faced vulnerability to food shortages as a result of rain failure and lack of agricultural inputs. A very few, less than 10% indicated other barriers to sufficient food production such as lack of draft power, poor soils, crop diseases and limited arable land.

Meals per day in the dry and wet seasons for adults: For Adults 18+, Most hh (60%) had managed to have access to two meals a day. Almost, one third of the farmers had just a meal[2] in a day. Less than five percent had accessed the or more meals. The hh had the same number of meals in the dry and wet season.

Meals per day in the dry and wet seasons for Children aged 6 to 17 years: most (47%) of the interviewed farmers hhs indicated that children from 6 to 17 years had access to at least two meals in a day. 20% of the hh had only managed a meal a day in the last seven days. Less than 10% had access to more than 3 meals in a day. The interviewed households had the same number of meals in both the 2018 wet and dry season.

Meals consumed by infants less than 5 years: The majority of the households (61%) did not have infants less than five years old. Of the 31% that had infants, 16% indicated that their infants had access to more than 4 meals in the 7 days preceding the evaluation. 13% of the hh had managed at least two meals a day for their infants. Very few less than 2% had only managed one meal in a day. Therefore 15%

Food Groups (FGs) Consumed by HHs in a Week

Most hh (94% and above) consume large grain cereal (maize), sugar products, vegetables, oils/fat and roots and tubers at least 3 days/week.

Dietary Diversity Scores

The Dietary Diversity Scores measure the ability to acquire a sufficient quality and quantity of food to meet all household members' nutritional requirements for productive lives. Among the 15

[2] Meal: A portion of food that a household or its individual members eat to satisfy hunger (Health Harvest, 2nd Edition, FAO, 2015

category food groupings it is expected that each member of the hh consumes at least five of the foods in at least three out of the 7-day week. From the interviewed farmers, 100% consumed large grain cereals which are the staple food in the Country.

After the staple crop, the second highest food group consumed were vegetables. 99% of the farmers indicated having consumed Vegetables on three plus days in a week. Large grains and vegetables highly correlate since the traditional staple meal is in most cases is made up of the two. The same applies to oils/fat which most farmers 89% also consumed, Oils/Fat are usually applied in vegetables in standard meal preparation. Sugar Products were fourth ranked with over 85% of the farmers indicating that they consumed sugar products in three and above days during in a week. The last food component to have a score above half was fish (51%). This averages at 87% of the interviewed farmers consuming at least five of the fifteen food groups in a week

Only 36% of the famers reported having consumed fruits during 7 days prior to the evaluation.

The remaining food groups, (small grain cereals, roots and tubers. legumes, meat, poultry, dairy products, corn soya blend, edible insects and game meat) were consumed by less than a fifth of the interviewed farmers during a week.

The Project managed to improve the production of nutritious food for target farmers particularly through the introduction of new horticulture varieties as well health eating education. This was particularly important in reducing the problem of high stunting reported in two districts. There was marked decrease in stunting in both districts according to district officials, the project contributed towards that decrease.

Conservation Agriculture Training Received

CA training received: All respondents reported having received CA training. Most of the training (84%) was provided by DAPP and GoZ while 11% was DAPP only and 4% GoZ only. Above half of the training was rendered through demonstration plots (54%), while 43% was through FC lessons and 1% through field visits. FGDS with farmers confirmed that DAPP project staff worked closely with Agritex extension workers such that they had joint training sessions for the farmers most of the time. Even when they came at different times they often consulted complemented each other.

Most respondents (79%) reported that they practiced CSA and the remainder 21% did not. Of those who practiced CSA, they reported applying some of the technics. The most popular was pothole planting (69%), followed by crop rotation (67%), intercropping with legumes (44%), crop diversification (39%) and use of inorganic manure (36%).

Disaster Risk Reduction (DRR)

Most interviewed farmers (61%) were not aware of DRR structures in their communities. They might have interacted with civil protection committees and extension workers unaware that they are responsible for disaster management.

Over 50% of the interviewed farmers acknowledged that hhs were involved in the formulation or strengthening of the early warning system/mechanisms by DAPP-UNEP. However, for those that acknowledged involvement, 35% indicated that they had been involved to a very great extent and 20% noted that they had somewhat been involved in this process. More than a third of the

respondents indicated that they had not been involved in the formulation of the waring systems and about 10% professed total ignorance about the matter.

On frequency of early warning messages (EWMs) received, over a third (37%) of the farmers indicated that they had not received any warning messages through the DAPP-UNEP Project in the last 12 months. Less than half (41%) of the interviewed respondents received more than five early warning messages in the last 12 months. Slightly less than a fifth received less than five EWMs in the same period.

Most (82%) of the EWMs received were for veld fires. Less than 10% of the messages received were for droughts, cholera, cattle diseases and floods.

In comparison to the number of EWMs received before the project a third of the interviewed farmers acknowledged that the frequency of the messages was now higher. Conversely, almost half of the remaining farmers revealed that there had been no difference whilst others noted a decline in the EWMs in the same period. 17% of the respondents did not know if there were any changes in the EWMs.

INDICATOR TABLE

Objectives & Results	Baseline	Target	Achieved
Specific objective			
1. **% of small holders farmers adopting agro-ecology farming practices – to include applying organic fertilizer to their crops, number of farmers having compost in their fields, and farmers involved in crop rotation - and eating healthy foods – including organic produced vegetables, fruits, and pulses such as sugar beans and peas.**	25%	50%	80%[3]
2. **% of small holder farmers engaged in vulnerability reduction and climate risk management activities**	20%	50%	35%[4]
3. **# of farmers' clubs established and active**	0	8	8[5]

[3] Indicator: $\frac{1}{n}\sum_{i=1}^{n} a_i = \frac{1}{n}(a_1 + a_2 \ldots + a_n)$ where, a_1 = Farmers that use organic fertilizer (53%), a_2 = Farmers with Composts in the fields (50%), a_3= Crop Rotation (67%), a_4=Vegetables and Fruits (67.5), a_5=Pulses (23%)= 52%. While there was wide adoption of agro-ecological farming practices 80% (DAPP Final Project Report), most of the farmers had limited resources for implementing the adopted practises (52%)

[4] CSA Techniques Practiced ((Ctrl Click to view table); Average of CA Techniques applied

[5] DAPP Final Project Report

Objectives & Results	Baseline	Target	Achieved
4. % reduction in greenhouse gas emission	-4,633 tCO2eq	5,455 tCO2eq.	7.3 tCO2eq[6]
Result A			
1. # of improved climate smart techniques covering production, water conservation and soil protection adopted by 50% of the farmers measured by climate smart farming techniques' adoption.	5	6	6[7]
2. % average yield increase for cereal production.	634kg/yr	710kg/yr	874kg/yr
3. % average yield increase for horticulture production.	206kg/yr	240kg/yr	440kg[8]
4. # hours of training completed by 2,000 farmers. Baseline : 48 hours, target: 982 hours	48hrs	982hrs	982 hours
Result B			
1. % average increase on family income from cereal sales for the 2000 targeted farmers. Baseline $66, target 10% or $72.60	$66	$72.60	$71[9]
2. % average increase on family income from horticultural sales for the 2,000 targeted farmers. Baseline $32.50, target 20% or $39	$32.50	$39	$81[10]
3. % average increase for family income from agro-processing for 2,000 targeted farmers.	$40	$48	Data available insignificant to make a

[6] Source: DAPP Carbon Report: Data used for calculation was not sufficient, in our view, to determine credible estimations for the project as required by IPCC standards for NDCs. However, DAPP must be commended for taking the initiative in the absence of comprehensive national guidelines on GHG estimations.

[7] All Farmers acknowledged having received training and adopted the various Climate Smart Agricultural techniques. However, implementation, particularly Gutu District, was very limited. CSA Techniques practiced (Ctrl Click to view table); in terms of regular application only two of the CA techniques were practised by more than 50% of the farmers.

[8] DAPP Field and Garden Crop Database

[9] Average yield sold * average price) – 196kg*0.36(average price of cereals)

[10] Average Yield sold * Average Price sold = (34% of 440) 149.6kg*0.54=81

Objectives & Results	Baseline	Target	Achieved
			calculation
4. % average increase for family savings for 2,000 targeted farmers. Baseline $175, target 10% or $192.5	$175	$192.5	25%[11]
Result C			
1. % of target households consume at least an average of 3 meals per day containing at least 5 of the 8 food categories derived from FAO Food Consumption Table for Africa. Baseline 56%, target 60%	56%	60%	85.4%[12]
2. Safe hygiene practices adopted by % of targeted 2,000 households. Baseline , target	23%	35%	21[13]%
Result D			
1. # attendees at 3 conferences held for community members and stakeholders (Goal: 120)	0	120	127[14]
2. # project end of term reports created (Goal: 1)	1	1	1
3. # copies of project report distributed to key national & international stakeholders (Goal: 80)	0	80	80[15]

[11] (HH Average Income - HH Average Expenditure) = $4 - $3: Savings =$1/day or 25% of income

[12] Dietary Diversity Scores (Ctrl Click) Count of Foods over 50% Consumed for 3 plus days

[13]

[14] DAPP's Final Project Report

[15] Source DAPP's Final Project Report

Most of the interviewed farmers had no individual written farming records as such Agritex officers made professional estimations and evaluators relied on some of the project comprehensive field databases where it was thought necessary.

Conclusions

The project successfully mainstream gender and reached more women than men had approximate direct beneficiaries of 12 000.

Output A**:** CSA was widely adopted by target farmers but implementation was on part of the production land. Farmers still practiced conventional farming on larger portions of their productive land. Lack of draught power and rugged terrain in Mutasa, encouraged farmers to embrace CSA.

Output B: Major constrains still remained in inputs for farmers to escape the poverty trap as most farmers did not produce enough to sell. The realized income from agriculture production was insignificant and many still found it hard to purchase quality inputs which affected their yields.

Output C: The project managed to improve their dietary diversity of target farmers through crop, horticultural production and achieved hh food and nutrition security. The Project managed to improve the production of nutritious food for target farmers particularly through the introduction of new horticulture varieties as well health eating education. This was particularly important in reducing the problem of high stunting reported in two districts. There was marked decrease in stunting in both districts according to district officials, the project contributed towards that decrease.

Output D: The project generated a lot of lessons and opportunities for learning. The project goals, some of the lessons learned, results were disseminated widely. However, while compliance in terms of report submission was done by DAPP to district stakeholders and UNEP, some of the District stakeholders in both districts were not well sensitized in the project goals. The project M&E system provided for collection of adequate project data but collection of quantitative data was rather weak. Rural farmers widely embraced the farmer education approach and felt it was empowering though a number of farmers still needed capacity to fully implement CA so as realize its full benefits as promoted under the project.

Project Design and Theory of Change: The project design was very relevant and well aligned with GoZ's national SDG goals as well as rural farmers' needs. The project period was rather too short to have achieved some of the intention outcomes like full adoption of CA where GoZ works with periods of 3 to 4 years; agroforestry and forestry carbon sinks need more time for trees to grow. Some of the target farmers had started growing trees as result of the education received, but they still faced challenges with some of the introduced varieties and needed support over time. The carbon calculation was a good initiative by DAPP, but at the time the project GoZ still lacked capacity in implementing IPCC guidelines as such some of the aspects that require national determination of GHG emission estimates were not defined. Field data collected at project level on GHG must be done in line with national guidelines which at the time DAPP implemented the project were not yet in place.

Summary Farmers' Evaluation and Recommendations

Evaluation Category	Assessment	Recommendations
Relevance: - extent to which the objectives of project were consistent with the beneficiaries' needs and requirements, Zimbabwe Government's Agriculture Sector Goals, UNEP global priorities and partners' priorities, project stakeholders, etc.	Promotion of small grains was suitable for climate requirements of the target communities.	DAPP to consider scaling up the Project and lessons learnt to be promoted widely to other needy farmers.
	Farmers voluntarily joined the FCs clubs due to the felt relevance of the project theory change.	Include solar powered small irrigation schemes in the project intervention.
	Farmers confirmed that the project did well on social inclusion of vulnerable social groups. Farmers felt the project met their farming skills needs and were satisfied with the farming skills provided.	There is need to further capacitate farmers with accountability systems as there existed some unresolved issues with regards to use of FC resources by FC leaders.
	FC clubs allowed farmers to pool resources together and enhance their adaptive capacities climate change.	
	Project had accountability mechanisms that provided mechanisms for feedback and remedy for complaints,	Strengthen accountability and transparency mechanism to reduce conflict.
Effectiveness: Assessing Degree to which project outcomes have been achieved as a result of project activities including unexpected outcomes.	Farmers felt the DAPP staff always provided them with accurate information on the project and regular community stakeholder meetings were held. Farmers felt that the project achieved most of its objectives as promised at inception.	Continue with the new approach which is demand driven and resourced as it empowers farmers to take responsibility and ownership of their development as opposed to traditional donor dependency. There was a general call for DAPP to expand the project to other wards in the same district
	Most of the project results were achieved using mostly local resources.	
Efficiency (sound	The project was managed	Model fields to increase ideally, each

management and value for money):-	well in line with DAPP administration policies for finance and procurement. Quality inputs were purchased were procured from reputable suppliers. The project worked well with local stakeholders at community level who included traditional, political and community leaders for the benefit of farmers. Ripper tines supplied were too few for the 2000 farmers as some would not have access or would lose on timing while waiting to use them	Rural wards were too wide spatially, each FC should have had its own demonstration plot to reduce the travelling burden on women as well as loss of productive time. Provide adequate resources at FC level.
Sustainability of results *(likely continuation of achieved results*	The project was able mobilize to mobilize local resources to enhance project result like inputs form seed houses and land from traditional leaders and farmers. Farmers felt that the project prepared them enough to continue without external assistance. They also felt the project lessons should be taught widely to other needy farmers. There was improved social organization of farmers with the structures set under the project. FC committees had constitutions.	Community structures set under the project still needed DAPP to continue with technical support to beneficially farmers. There was need to improve drafted FC constitutions as well compliance with the same to enhance mutual accountability and reduce conflicts. DAPP should consider group maturity index (GMI) tools for developing these community structures.
Project Impact Assessment *(achievement of wider effects):*	Farmers reported that they would be able to maintain equipment supplied by the project on their own. Most farmers felt the acquired skills will be sustained without external support. The project supported farmers who were mostly	The decline in the area under CA, shown a natural trend in the impact of rural projects. Rural farmers need sustained capacity building in CA for minimum of 3 years in line with GoZ strategies. Target local leaders with project goals and lessons to influence policy change.

left out of other development projects. The FCs club were able to equip the whole family as any capable family member was free to participate in the activities.

Recommendations

- DAPP to consider scaling up the Project and lessons learnt to be promoted widely to other needy farmers. The project period was rather too short to have sustainably transformed traditional farming practices.
- Project design should include installation of solar-powered small irrigation schemes in the project intervention to avoid disruptions of practical demonstration as a result of water shortages.

- There is need to further capacitate farmers in record-keeping at hh level for resource efficiency and accountability systems at FC levels to reduce conflicts issues with regards to use of FC resources by FC leaders.

- Strengthen accountability and transparency mechanism to reduce conflict.
- DAPP should continue with the new approach which is demand driven and resourced as it empowers farmers to take responsibility and ownership of their development as opposed to traditional donor dependency.

- There was a general call for DAPP to expand the project to other wards in the same district
- Demonstration fields to increase ideally, each FC should have its own demonstration field or garden to reduce the burden of travel and loss of productive time on women and the elderly.

- Provide adequate resources at FC level in order fully demonstrate CA.
- Community structures set under the project still needed DAPP to continue with technical backstopping as Agritex is still underfunded.

- There was need to improve drafted FC constitutions as well compliance with the same to enhance mutual accountability and reduce conflicts.

- DAPP should consider group maturity index (GMI) tools for developing these community structures.

- The decline in the area under CA, shown a natural trend in the impact of rural projects. Rural farmers need sustained capacity building in CA for minimum of 3 years in line with

GoZ strategies.

- Target local leaders with project goals and lessons to influence policy change
-
- Specifically targeting local, government, traditional and religious leadership with climate change awareness raising as recommended at endline need to be need to be factored-in when implementing similar future projects for sustainability of outcomes and impacts.
-
- In future the such opportunities, as the one in Mutasa of penned livestock due to land shortages of pastures must be fully capitalized for managing GHG emissions
-
- Kukwanisa Model Farm is a strategic community asset which needs improved management for the community to realize its full benefits of diversified skills for livelihoods projects. Some farmers in Gutu Ward 8 who knew the model farm recommended that DAPP would establish a similar model in their ward. The Chief and Counsellor were prepared to provide the land for the same.

- DAPP should consider further capacity building on climate change and the use of FAO's Carbon Ex-Act Tool to enhance quality data collection which can feed into the national GHG inventory.

1. INTRODUCTION AND BACKGROUND

1.1 Introduction

Development Aid from People to People (DAPP), with funding assistance from United nations Environmental Programme (UNEP) is implementing a two year project titled, 'Sustainable Lifestyles among rural families in Zimbabwe: Small-scale conservation farming to change lifestyles in Africa and beyond'. The project, running from February 2017 to December 2018, was being implemented in Manicaland Province (Mutasa District) and Masvingo Province (Gutu District). The project aims to promote and replicate sustainable farming, adaptation and mitigation to climate change for families living in the rural areas in Zimbabwe. DAPP commissioned Saving Livelihoods Team (SALIT) to conduct an endline study for the project. The endline survey was conducted in Gutu and Mutasa district between November and December 2018. The objective of final evaluation was to examine the impact of activities undertaken by DAPP Zimbabwe in relation to the objectives of the project as set out in the project description approved by UNEP and provide lessons for future programming.

1.2 Project Background

Since 1980, DAPP has worked through its various projects, Farmers' Clubs, Hope, Child Aid and Total Control of the Epidemic (TCE) to promote sustainable means of agriculture in rural and urban communities in Shamva, Guruve, Rushinga, Mt Darwin, Mutasa, Makoni, Zvimba and Gutu. DAPP has engaged in a number of short and long term projects with the aim to strengthen the capacity of rural farmers to produce adequately and move towards sustained food security primarily at household level and eventually at community level. DAPP Zimbabwe Farmers Clubs have recorded relevant success stories since their establishment in 1996. To date Farmers' Clubs have graduated a number of farmers from subsistence production to semi-commercialized agriculture with some successfully engaging in contract farming. DAPP in the current project with the title, Sustainable Lifestyles among rural families in Zimbabwe: Small-scale conservation farming to change lifestyles in Africa and beyond, intends to provide local farmers with the knowledge and skills to support themselves and their communities through sustainable farming, adaptation and mitigation practices to climate change. The main outcome is that sustainable farming, adaptation and mitigation to climate change and living in the rural areas in Zimbabwe are promoted and replicated.

1.2.1 Project Outputs

The project aims to respond to these circumstances through four interlinked outputs:

i. Improved agricultural and climate smart production/consumption systems are applied by 2,000 farmers;
ii. Family income and livelihood options improved for 2,000 families through crop production, agro-processing and market linkages;
iii. Dietary diversity and general health improved by the targeted 2,000 farmers; and
iv. Project goals, lessons learned, results disseminated widely.

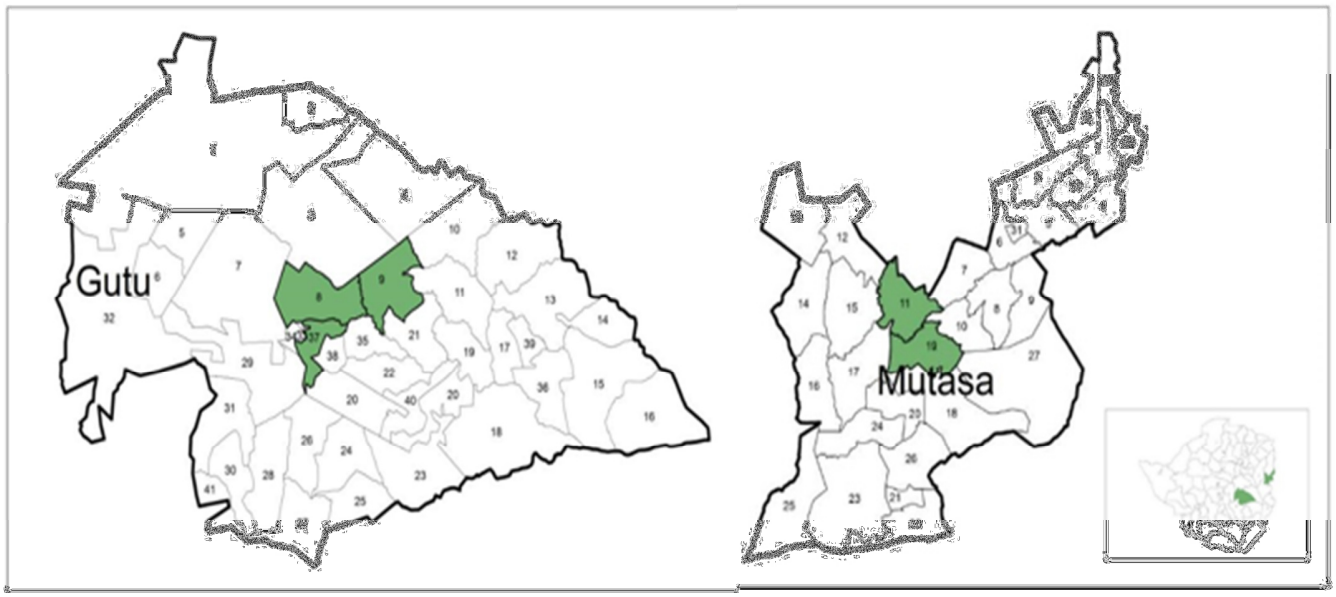
1.2.2 Project Outcome

The project's main outcome is that sustainable farming, adaptation and mitigation to climate change and living in the rural areas in Zimbabwe are promoted and replicated.

1.2.3 Geographical Coverage of the Project

The project is being implemented in five wards, two districts (three wards in Gutu and two wards of Mutasa districts) in two provinces Masvingo and Manicaland.

Figure 1: Project Map



1.2.4 Population Targets

The project will be implemented in a total of five wards (three wards in Gutu and two wards of Mutasa districts). The project targets 2000 small scale farmers, 1000 from Gutu and 1000 from Mutasa District.

2. OBJECTIVES OF THE ENDLINE

2.1 Purpose of the Endline Survey

This final evaluation examined the impact of activities undertaken by DAPP Zimbabwe in relation to the objectives of the project as set out in the project description approved by UNEP. The evaluation provided an opportunity for many project stakeholders to critically reflect on the activities and approaches undertaken, project successes and challenges, and goals met or not met. It is envisaged that the evaluation inform UNEP of the grantee's performance at the project level as well as other would-be potential implementers of sustainable farming projects in future

ENDLINE EVALUATION METHODOLOGY

This section presents a description of the evaluation methodology used to collect adequate information from beneficiary farmers (households), project stakeholders- policy makers/community leaders and decision makers from rural district councils, community health centers, schools and communities.

3.1 Survey Team

The survey was carried out by two teams. The first team constituted four senior research scientists who provided overall leadership of the survey including approval of survey methodology, designing of tools and review of this report. The second team comprised of 5 field researchers, who conducted the training of enumerators, administered Key Informant Interviews (KII) and Focus Group Discussions (FGDs) tools. The third team had a total of six enumerators who carried out the household data collection using the household survey questionnaires that were loaded on electronic devices. These enumerators were selected and trained from among the extension workers working in the respective districts (*Table 4*).

Table 1: Summary of the management structure of the endline study

Province	District	DAPP Logistics Coordinators	Evaluation Manager	Team Leader	Consultants	Enumerators
Masvingo	Gutu	4	1	1	2	3
Manicaland	Mutasa	4		1	2	3

Source: *Primary field data*

3.2. Field Logistics

DAPP seconded its staff to accompany SALIT research teams during fieldwork.

3.3. Target Population

The survey targeted men and women living in five of the target wards in the two districts (Gutu and Mutasa) and data was collected at three levels: household, institutional and community levels. Key informants were drawn from district government officials, ward councilors and community leaders whilst FGDs' participants were drawn from beneficiary farmers. Specific samples sizes were discussed under methodology section be given in this report.

3.4. Survey Design

The survey design was informed and guided by DFID Sustainable Livelihoods Framework (SLF), which looks at five major assets types and their vulnerability context. The Assets included, natural, human, financial, infrastructure and social. In the design of data collection, the endline study used 'The Rashomon Theory' which involves use of two different lenses, the quantitative and qualitative data collection methods – descriptive study. These complementary data collection methods were used to ensure participation of relevant agriculture sector stakeholders as well as collecting adequate information to complete the end line within the available financial and material resources. Through the complementary approach, each method contributed information that may have been missed by adopting only one perspective, hence bringing triangulation which results in authentic analysis. Survey tools were designed to gather data in line with DAPP project M&E framework indicators.

3.5. Mobilization of Endline Survey Key Informants

Mobilization of informants for the survey was done at various levels. DAPP staff introduced the survey team to all relevant government ministries at district and community levels. The authorities included, Provincial Administrators (PAs), District Administrators (DAs) and RDC CEOs. The authorities gave permission to the survey teams to meet the Districts' stakeholders. Ward Councilors, Chiefs and Village Heads and to communities. The mobilization ensured that almost all respondents knew ahead of the study. Where target respondents were not available due to other work commitments, especially from government institutions, representatives with relevant knowledge of the project were asked to stand in for their superiors.

4. Endline Research Methodology

SALIT understood that the endline had to inform and guide, including providing a critical look at the project achievements and an evaluation the implementation process, progress and achievements of the project. It was therefore, required to clearly understand the project logical framework, including content of the proposal, objectives, results and indicators in order to undertake an assessment that will measure the amount of change with regards to agricultural and climate smart production/consumption systems, family income and livelihoods options, food security, dietary diversity and general health of the 2000 project beneficiary farmers.

SALIT developed a mixed methodology that was technically sound and shared and agreed on endline tools with DAPP before field engagement. A diversified methodology (both Qualitative and Quantitative) was employed comprising of different survey methods (independent and participatory evaluation techniques). Data was collected using participatory appraisal techniques, such as (but not limited to) participatory learning and action and the sustainable livelihoods approach. Data collection from the project sites was conducted with both project beneficiaries and non-beneficiaries, that include key stakeholders.

4.1 Qualitative Data Collection Methods

The following methods were employed in qualitative data collection

4.1.1 Literature Review and Review of Project Documents

As part of the study, the survey team carried out a review of literature to provide an understanding of the end line research context, background and also to reflect on the project's theory of change. The evaluation derived information from various secondary sources such as local government policies and strategies, climate change (e.g. National Climate Change Policy, Climate Change Response Strategy, draft Disaster Risk Management Bill, National Agricultural Policy, Zimbabwe's Climate Policy, Climate Response Strategy, Zimbabwe Demographic Health Surveys (ZDHS), Zimbabwe National Nutrition Strategy and national CA Manual. Other documents reviewed included the DAPP's Farmers' Club Manuals, project proposal (including logical framework), beneficiary registers, policy and strategy documents and other relevant documentation related to food and livelihood security, nutrition and disaster risk reduction.

4.1.2 Key Informant Interviews (KIIs)

The survey team purposely sampled and conducted semi-structured interviews with 51 key informants (individuals in key positions) taking into account their gender, local leadership positions and in-depth knowledge of agriculture and climate change issues. A detailed KII guide was used to collect important insights on farming practices, food security and climate change in the survey area

from the key stakeholders. The key informants included employees of Government ministries, Departments and technical/extension agencies like Ministry of Environment, Water and Climate, Ministry of Agriculture, Water, Climate and Rural Resettlement, Ministry of Women Affairs, Gender, Community Development and Small and Medium Enterprises, Ministry of Youth and Economic Development, RDC staff (CEO), District Social Services Officers, Human Resources Officers, Finance and Administration officers, local leaders (councilor, village heads), among others to obtain relevant information on specific issues, create a forum for discussion and give the project participants and stakeholders an opportunity to critically reflect, ask questions and discuss their insights and lessons from the project to inform future programming. The key informant interviews were planned ahead of time and had a specific focus but flexible format. Interviews were flexible in terms of where to meet and were carried out by the SALIT core consultants. See Attached List of KIIs.

4.1.3 Focus Group Discussions (FGDs) for Community Groups

The Consultant(s) used FGDs to solicit information and views from project beneficiaries and non-beneficiaries. Sources of information for FGDs included community leaders, Farmers' Clubs (women and men, OVCs, members of support groups, traditional leaders, women's clubs and people living with HIV. FGDs were expected to solicit information on the following, among others: utility, adoption and performance of conservation agriculture, household dietary issues, and crop marketing dynamics, inclusive of value chains, agro-forestry practices, climate change adaptation, disaster risk management, policy and institutional mechanisms. Information obtained provided useful insights in the formulation of the end line survey recommendations.

4.2 Quantitative Data Collection

Household survey was conducted to determine households' demographics, socio-economic characteristics, their access to water and sanitation facilities, access to adequate water supply, their knowledge, attitudes, beliefs and practices regarding conservation agriculture and climate change. Observations were also recorded and analyzed using this tool. Interviews were done using a household questionnaire targeting the head of the household who could be assisted by other family members. In order to be eligible to participate in the survey, a household representative had to verbally accept to be interviewed before being interview.

4.2.1 Household Questionnaires (HHQs)

The household[16] was used the primary sampling unit for the study. This is consistent the national standard practice by Zimbabwe Statistical Agency (ZimStat) for similar assessments. In depth household interviews were administered to households for the small-scale farmers registered as project beneficiaries. The interviews were guided by a standard interviews with closed questions that covered a wide range of variables such as demographic information, assets, vulnerability, social accountability, household hunger scale, marketing of crops, market literacy, value-chain development, education, income patterns, water use, conservation agriculture methods, livelihoods, disaster risk awareness, etc. Household heads were targeted for interviewees, in their absence, an adult family member would answer on their behalf.

[16] ZimStat defines a household as a person or group of related or unrelated persons who live together in the same dwelling unit (s), who acknowledged one adult male or female as the head of the household, who share the same housekeeping arrangements and who are considered as a single unit (DHS 2015:7, 13)

A representative sample of all the beneficiaries was selected for interviews. The actual sample size was based on representative sampling across the five wards. On the basis of a total of 2000 beneficiaries (sampling frame), 364 questionnaires were administered. The questionnaire was designed in KoBo Collect using Android Tablets. KoBo has formulas that allow data cleaning during data capturing.

All major findings were triangulated so as to crosscheck the accuracy of feedback from all the endline data sources.

5. Sampling Frame and Sample Size Determination

The sampling frame for the endline was the 2000 registered farmers, 1000 per each district.

5.1 Sample Size Determination

Total sample size was calculated using Research Advisors' Sample size calculation table[17]. A total representative sample size of 364 for the five wards was decided.

Table 2 Sample Sizes and Distribution

Masvingo, Gutu	
Ward 8	61
Ward 9	61
Ward 37	59
Manicaland, Mutasa	
Ward 11	124
Ward 19	59

The researchers used a combination of three methods to determine samples sizes: probability proportional to size (PPS) was used to determine district and ward sample sizes. Purposive sampling was used to select farmers' clubs and random and convenience sampling was used to select specific households to be interviewed within each farmers' club. The methods were suitable considering that the farmers' households were far away from each other and in most places there no usable roads within the villages. This means that the wards with more beneficiaries had more farmers were had more farmers targeted for questionnaire administration, while those with fewer had fewer interviews conducted. Project beneficiaries were considered already randomly selected at registration since the project was demand driven. The total number of interviews was 364.

Other techniques and tools

For FGDs and Key Informant Interviews, purposive and convenience sampling were used, based on time schedule and availability of participants, among other factors.

5.2 Instrument Pretesting and Training of Enumerators

Data collection was conducted with the help of six trained field assistants based in each of the two districts, drawn from Government agriculture extension workers. These teams of enumerators were trained for one day each preceding the pilot testing and subsequent data collection in each district. This means two trainings were done for the enumerators, one for Mutasa and one for Gutu District. The training focused on research methods, project background, research ethics, rapport

[17] Sample Size Calculation table is an excel based free tool designed by Research Advisors which automatically calculates sample size once sampling frame is entered (www.ResearchAdvisors.com)

building and techniques of administering the end line questionnaires, relevance and validity of the questions asked, as well as community entry. The trainees were taken through the prepared household survey questionnaire uploaded on the tablets. This was done to ensure that the enumerators correctly understood the questions and to agree on definitions as well as interpretation of questions and units of measurement. This exercise was performed with a view to minimize enumerator bias. Part of the training included mock interviews to test the interviewing skills of the enumerators.

After the training of enumerators, data collection tools were pre-tested. During pre-testing emphasis was placed on translation of the research questions into vernacular, agreement on the responses required removing ambiguities in the wording of the questions as well as on assimilation of additional answers for coded questions. Following an analysis of the pre-tested research questions, corrections were noted and tools were revised before the actual data collection.

6. Data Collection and Analysis

6.1. Qualitative Data Processing and Analysis

Qualitative data gathered through semi-structured interviews and focus group discussions were transcribed and subjected to content analysis. The transcribed data was subjected to classification, coding them into various themes, and bringing out the different characteristics. Data was coded and analyzed by manually. A narrative and detailed description with participants' quotations was used to capture participants' actual views.

6.2. Quantitative Data Entry, Editing, and Analysis

Appropriate systems were developed to ensure that the editing and data entry processes were automated as much as possible to ensure accuracy, consistency and speed of reporting. The process was as follows:

A. Completed questionnaires were booked-in on the fieldwork monitoring system.
B. All questionnaires were visually checked for
   i. Completeness,
   ii. Clarity and
   iii Sense/consistency.
C. Once past the initial sight check, the completed questionnaires were entered onto the system (using double data entry to prevent keying errors).
D. The data entry system was created and conducted using KoBo Collect, and Excel sheets programmed to run a number of logic checks to alert the person entering the data to any inconsistencies or failure to pass logic checks. On completion of data entry, data was cleaned and analysed using ODK to provide descriptive statistics and cross tabulations. Additionally, analysis of variance, comparing, controlling for background characteristics, was performed to evaluate disparities that existed between the districts, project beneficiaries and non-beneficiaries, age groups, men and women, etc.

6.3. Spatial Data Collection

Global Position System (GPS) coordinates were collected using standardized android version 4.4 devices (Lenovo A3 Tabs). GPS devices were set to decimal degrees. Spatial data was collected for spatial components: surveyed households' GPS coordinates were mapped as a control measure to ensure data was collected from the respective households. KoBo Collect was used to

develop electronic forms for collecting spatial data. The collected spatial data was instrumental in the development of maps which are a compact and elegant method of communicating information.

6.4 Observations

Evaluators used field observations to confirm or validate some of the project results. Among areas of observations assessments were used were WASH facilities, CSA technics employed.

6.5 Photography

Observations of special interest were photographed such as gardens and field crops.

6.6 Video Recording of Most Significant Stories (MSS)

FGDs and key informant interviews were used to identify the most significant changes or impacts of the project in the project sites. For identified case stories detailed interviews were carried out video recorded were possible for wider sharing.

6.7. Data Triangulation Methods

Data was subjected to rigorous triangulation by comparing section specific responses across a wide spectrum of respondents and data sources to reduce bias and check for inconsistencies in the data. Qualitative analysis added a number of dimensions to quantitative statistical results. It necessitated the interpretation of some statistically emerging issues. Observations by researchers also provided additional evidence and information that was useful in the interpretation of results.

6.8. Evaluation Quality Management

The leadership team provided overall quality checks for the study. Use of Kobo collect in data collection ensured that, data validation was done as it was being captured. Data capturing errors were minimized as the electronic device had some checks and controls and skip function that ensured that logical and relevant data was entered. The only errors that were possible were typo errors and errors due to poor interviewing skills. KoBo Collect doubled as a data collection and real-time data analysis tool.

6.9. Survey Challenges

Some challenges were experienced that delayed but not necessarily hinder the successful completion of the survey. These included delays in signing contract agreement; challenges in getting fuel to go the field, cash shortages, and frequent power cuts as well very poor mobile next work in the field that made data collection very difficult. The poor road network system made some villages very hard to access.

6.10. Limitations

This survey had the following limitations:
The survey was limited by available time and resources. The survey report does present a complete and comprehensive analysis of all the issues in the project wards but a representative picture of the situation based on data gathered from a representative sample of registered farmers only. This was done with an aim to provide progress towards objectives and provide recommendations for future programming.

7. Ethical Considerations

The survey methodology addressed ethical principles of respect for persons, and confidentiality. Measures were put in place to protect individual anonymity, minimize harm and maximize benefits, which included providing adequate information on the objectives of the survey and seeking consent from respondents before their participation. During the course of the endline survey, enumerators adhered to these ethical guidelines and sought consent from respondents. Participants were aware that there were no conditions for participating in the endline and involvement did not mean selection for benefiting from the project. Personal opinions of respondents were distinguished from official positions. Consent to take photos or publishing them was sought and obtained for all pictures used in the endline report.

8. Overall Management and Supervision of the Assignment

The consultant reported directly to the Partnership Manager on all contractual obligations. The Grants Administrator and Partnership Manager were responsible for approving the quality of work (including tools, methodology and report structure) and the extent to which the report fulfils the requirements stated in the ToR before payment was done.

9. RESEARCH FINDINGS

Household[18] Demographics Profiles

Household characteristics are important in determining the potential impact of the project on women and men. Majority of the respondents (61%) were women and 39% men. Researchers observed that there were more female FGDs participants than men. Participants of FGDs were drawn from FC members attending regular meetings at either usually meeting venues. Observations also showed that there were few youths among FGD participants. Most of them were elderly men and women. Joining FCs was voluntary. When asked whether young people were participating in the project, the participants pointed that young were in school but were helping with labour in the field and gardens.

Table 3: Sex of Respondents

Sex	Gutu	Mutasa	Total Ave.
Female	67%	78%	72%
Male	33%	22%	27%

Figure 2: Gender

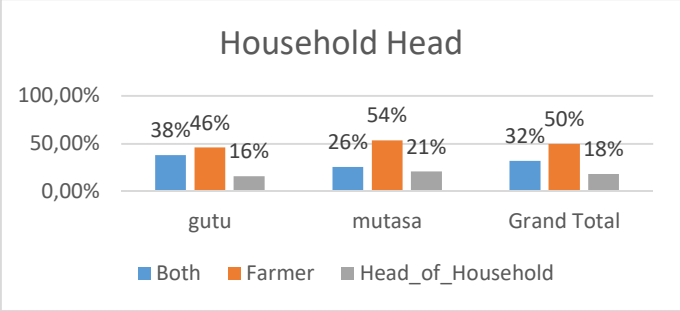
Gender of the Respondents

Figure 3: HH Head

A representative sample of 364 out of the 2000 beneficiaries' households were interviewed in from both districts in this end-line evaluation, majority (70%) were female and the remainder (30%) were male. The project exceeded the targeted of sixty percent female beneficiaries**.** This generally reflected the gender distribution in the registers of beneficiaries for the project which were reviewed by the evaluators. The project targeted sixty percent women and the target was therefore exceeded by ten percent.

FGDs with beneficiary farmers established that the farmers joined the project voluntarily after presentations from DAPP. Women reported that they were in the majority of the communities as most were widows while a few men had moved to urban areas in search of employment. Men who participated in the project were mostly representing their wives and were not ashamed to report that their wives were leading in the project.

Each Farmers' Club had a committee of seven members and the majority were women. However, in many cases women preferred to elect the few men to chair the committees. The main reason was that women had household roles that left them with limited time for coordinating such committees. The evaluator concluded that while the project targeted more women farmers than men, it did not discriminate according to gender. It empowered women to take up leadership



usually reside together and eat together regardless of relationships

Head of Household

Half of the respondents were the farmers in the DAPP-UNEP Project, of these farmers 32% were heads of their households while the remaining 18% were not about 50%, who do not head their respective households. The other 50% were both farmers and household Heads. Farmers Clubs allowed the whole family members to participate in club learning and farming activities, thereby empowering all of them. In Gutu, researchers saw school children coming to work in the nutrition gardens with their parents. In Mutasa, Ward 19 Mvere B Farmers' Club, the club chairperson came with his old parents and brothers' wives who he invited to join the club and learn farming skills.

Mrs. Magan'a Family: A Case of an Empowered Woman showing Entrepreneurship Providing Leadership at Household and Community Levels

Mrs Magan'a is a sixty year old woman from ward 11 in Mutasa District of Manicland. She lives with her husband near Kukwanisa Demonstration Farm. Though a long time member of DAPP farmers' club, she and she was a long time beneficiary of one of the Farmers' Club under DAPP-UNEP Project under which she has inspired many fellow farmers. She team up with her husband to acquire an incubator for $1400 through Practical Action's Match Fund Inspire Project after other farmers failed to raise the required funds. The incubator is based at DAPP Premises and she is producing indigenous chicks for fellow DAPP-UNEP project farmers in Mutasa. The husband operates the incubator since it requires intensive management and technical skills. He paid tribute to his wife in these words, "You see all these achievements, and our good life; it's because of my wife. We can take care of ourselves and our grandchildren because she works hard and I am happy to be led by her". Mrs. Magan'a is one of the first potters to make tsotso stoves, she trained her husband as well and together they produce stoves for sale to local market. She had confidence that she is now an expert in making an improved tsotso stoves that she could provide consultancy services to NGOs implementing livelihoods projects.

Being a very skilled and experienced entrepreneur, Mrs Magan'a claimed that through her close relationship with DAPP and Practical Action, she inspired other DAPP-UNEP farmers to take up the cattle fattening project (Powerhouse Cattle Fattening) which was also doing well, housed at DAPP Model Farm. The project was doing well with head of 35 cattle which were ready for slaughter at the time of the survey. While the project was farmers led and funded by farmers themselves Practical Action assisted in linking the farmers with financiers and feed suppliers such as abbatoirs and feed producers .

Though DAPP and Practical Action had no formal working arrangement, but "a field relationship" according to Project Officer at Practical Action, they complimented each other many ways including diversification of livleihoods and they sometimes organised joint trainings of farmers. Both Inspire Porject and DAPP-UNEP had more emphasis on software than hardware in their livelihoods support design.

Figure 4: Case Story 1 Mrs. Magan'a

Marital Status

Most of the respondents (59%) were married or living with their spouses. Almost a third (29%) were widowed. Gutu had more windowed interviewees (33%) and Mutasa had 25%. Mutasa had a higher number (65%) of those married and living together while Gutu had slightly above half (55%) of the farmer interviewed living together. 8% were married or living apart. Of these, more were among those interviewed in Mutasa (10%) than those from Gutu (6%). 3% were either separated or divorced and of these more were from Gutu (5%) than those from Mutasa (2%). FGDs with farmers confirmed that farmers' clubs had more women than men because there were more windows in the communities and that some men left for towns in search of employment. Rural urban migration is a challenge in Zimbabwe that increases vulnerability of rural communities as most productive people migrate leaving vulnerable social groups as women, elderly, children and the disabled. The project was relevant in that it sought to increase both hh food and nutrition security, general health as well increasing income from agriculture which reduces labour related migration. *"I no longer need to leave in search of employment elsewhere I as am making money through agriculture as result of skills I learnt from DAPP-UNEP Project"* declared one middle-aged male farmer from Guvamatanga Farmers' Club, Ward 8 Gutu District.

Distribution of Household Member by Gender

The responses collated from the survey data show that the average household size had six hh members[19] (88%) and only 12% of HH had households that had more than 7 people. Both Genders were equally distributed evenly with 96% of the households having an equal number of males and females. With a target of 2000 farmers, the project potentially reached 12 000 direct beneficiaries. In some cases farmers' clubs had apostolic sect members with more than one wife, the project had wide reach.

Religion

Less than half (39%) of the interviewed farmers belonged to mainline churches, and 38% belonged to apostolic sect while 19% were Pentecostal and 2% were traditional believers. Religion can aid or hinder farming practices. FDGs with farmers indicated that some farmers refused to keep some livestock like rabbits because of beliefs. Farmers in Gutu Ward 37 believed a dry borehole wrongly sited near Chief Chipere area was due to angry medium spirits. Climate change was attributed to disregarding cultural values by communities. This disempowers farmers from taking action against climate change hazards as they would not think of as needing human action.

During FGDs in Mutasa, members from the apostolic sects did not adopt certain small livestock species due their beliefs which regarded clawed animals such as rabbits, ducks and non-ruminants such which include pigs, as ceremoniously unclean. At the same time traditional leaders' church as chiefs and some local government executives were skeptic about scientific explanations to climate change and proposed management approaches. Their predilection towards indigenous knowledge systems (IKS) made them preferred the latter and regard scientific approaches as NGOs strategies for accessing funding. This perceptions had an effect on the attitude of public officers' buy-in the new approaches like DAPP-UNEP project.

[19] HH members referred to those people who lived, cooked together within 30 days prior the survey whether or not they were related by blood.

Specifically targeting local, government, traditional and religious leadership with climate change awareness raising as recommended at endline , needs to be need to be factored-in in future projects for sustainability of project outcomes and impacts.

Arable Land Owned

Less than half (40%) of the farmers interviewed across the project districts owned (0.5 to 1ha)., 20% owned less than 0.5ha and another 20% owned between 1.5ha and 2ha. 13% owned between 1ha and 1.5ha Only 6% owned between 2ha and 4ha. Close to half (48%) of the farmers interviewed in Mutasa owned between 0.5 and 1ha, 30% had less than 0.5ha; 13% had between 1ha and 1,5 while 6% owned from 1.5ha to 2ha and only 4% owned from 2ha to 4ha and none owned above 4ha. In Gutu 35% of the farmers interviewed owned between 1.5 and 2ha; while 31% owned between 0.5ha and 1ha. 14% owned between 1ha and 1.5ha. 8% owned between 2 and 4ha and 1% owned between 4ha and 6ha. Farmers from Mutasa have smaller pieces of land than their counter

Field observation by researchers showed that the project wards generally had poor sandy soils which are typical of most former tribal trust lands in Zimbabwe. Gutu has less land cover than Mutasa which has generally steep landscape. Both of these factors contributed to rapid run off causing soil erosion and gulley formation and seasonal rivers. There is considerable land pressure from population growth as hh are forced to share land with their adult children, especially in Mutasa Ward 11. The hills take up much of the land space such that some farmers are settled in gazzetted Mutasa Growth Point District Centre (DC) where they occupy land as small as high density stands of $300m^{2.}$ Since arable land is a critical resource for rural hh livelihoods, CA helped farmers to produce more on small pieces of land given that most do not own livestock and the topography may not allow use of ox drawn plows. Through FGDs farmers appreciated the training in compost making using available biomass as it helped them avoid high fertilizer costs. Shortage of land in Mutasa meant that livestock livelihoods were less preferred as farmers had no pastures for free ranching. Those with livestock particularly in Mutasa, had challenges of feeding. There was an opportunity to teach farmers with penned livestock on feeding and manure management to reduce GHGs emission from ruminant animals but there were no reports on such training. Training on feeding was being provided by Livestock Production Department (LPD) but the restructuring was affecting the extension services. There were gaps as farmers like the Powerhouse Cattle Fattening Project reported inadequate technical backstopping. The coordination among DAPP, Practical Action was and LPD left gaps such that farmers lived in fear of losses which affected another dairy project at Kukwanisa Demonstration Farm. In Gutu, most of the livestock were on free range as such emissions from livestock were considered evenly distributed not significant source. Land use regimes, by district generally, showed that crop and fruit productions were common for Mutasa while livestock and crop cereal production were most preferred for Gutu.

In future the such opportunities, as the one in Mutasa of penned livestock due to land shortages of pastures must be fully capitalized for managing GHG emissions

Kukwanisa Model Farm is a strategic community asset which needs improved management for the community to realize its full benefits of diversified skills for livelihoods projects. Some farmers in Gutu Ward 8 who knew the model farm recommended that DAPP would establish a similar model in their ward. The Chief and Counsellor were prepared to provide the land for the same.

Soil Types

Table 4: Soil Types

Observe the land, crops and soils type			
Row Labels	gutu	mutasa	Grand Total
Clay	1.11%	0.00%	0.55%
Clay loany	1.67%	5.49%	3.59%
other	0.00%	59.34%	29.83%
Red	1.11%	21.98%	11.60%
Sandy	37.78%	13.19%	25.41%
Sandy loany	58.33%	0.00%	29.01%
(blank)	0.00%	0.00%	0.00%
Grand Total	**100.00%**	**100.00%**	**100.00%**

Most soils in Gutu District were mostly sandy or sandy loany (53%) while those in Mutasa were sandy, sandy loany, clay or clay loany. The soils mostly allowed for heavy leaching and seepage of water with poor moisture retention. Composite manure was required to increase soil fertility and use of biomass was appropriate for areas with mountains. Soil tests services were available at Africa University at subsidized $10/sample. According to the District Agritex Official from Mutasa, testing soils helps farmers to determine what nutrients will be missing in their soils and reduce wastage of fertilizers.

Assets Owned

Livestock Owned: Almost all interviewed hh kept chicken (96%) while above half (57%) keep goats; 44% kept cattle and 18% kept turkeys. In most cases, interviewed farmers from Gutu kept more cattle, goats, turkey except for rabbits or ducks. Livestock are key assets for building resilience of rural communities; they provide multiple economic, social, and risk management functions. Farmers generally owned small livestock and small herds of cattle due to CC related stresses or lack of pastures especially in Mutasa District. Some of the farmers had no livestock and had low adaptive capacities. Some of the reported direct effects of CC on livestock include loss of herd due recurrent droughts, low productivity/quality, increased spread of vector-borne diseases and macro parasites of animals as well as the emergence and spread of new diseases.

Sources Household Income and Expenditure: Most interviewed farmers (60%) earned incomes from sell on either crop sales. 38% earned through casual labor, 15% through pensions, 14% through salaries, 9% through remittances. Very few earnt money through trading or other means. While hh interviews showed that farmers in Mutasa relied more on livestock sales while those in Gutu earn money from crop sales, FGDs and KIIs showed that farmers in Mutasa produced more crop, horticulture produce and fruits while those in Gutu kept more livestock. Most hh produced enough for their consumption but not excess to sell.

Income: about half of the hh interviewed (51%) earned S$2/day while 41% earned between US$2 to US$5/day. Farmers spend most of their income on food and education.

Expenditure: less than half of the interviewed farmers (48%) spent US$2/day, while 44% spent between US$2 and US$5 and 6 % spent above US$5.

Their low disposable incomes as compared to their income and therefore still could not their basic needs of food and inputs. While crops and livestock form the most common sources of income hh

in both districts, farmers have other diverse income sources to supplement income from agriculture production which are less than expenditures. There was a significant number of pensioners, this group was aged and physically constrained as such, vulnerable.

Spending patens: Majority(92%) of the interviewed farmers spent their income on buying food, while 36% education, 32% on buying soap 12% on health treatment, 7% on inputs and 4% on clothing.

Home appliances owned: Almost all of the hh owned cellphones (95%), while 55% owned radios; 21% owned television sets which are mostly powered by solar and 5% owned refrigerators. Majority of the farmers have own vegetable gardens.

Source of power: Most hh interviewed (63%) used solar power for home appliances while 18% use batteries/generators and 8% of used electricity. None among those interviewed in Gutu used electricity. They have no refrigerators to preserve perishable food. Therefore, natural and traditional preservation methods such as sun drying encouraged by the project were appropriate.

Power over assets: Power to make decisions over assets lied mostly (52%) with both husband, 20% wives only had power, 16% parents and children and 12% husband only. Married men had less power. The project empowered women with decision making power when compared to endline situation where women had less power.

Durable Assets Owned: Most (71%) of the interviewed hh owned gardens; 51% owned wheel barrows, 23% bicycles, 14% ox drawn cuts; 12% watch; 8% cars; 6% motor cycle. In most cases farmers in Mutasa owned more assets than their counterparts in Gutu except for ox-drawn carts only.

Fuel Used: Almost all farmers interviewed (98%) used firewood for fuel, and 1% used electricity. None among those from Gutu used electricity. Poverty causes land degradation, and vice versa. While most hh still use conventional wood stoves, a good number of farmers adopted the climate smart tsotso stove promoted by the project. Researchers visited some homesteads and observed farmers using the technology which they preferred for being fast and using less fuel. However, there were still many farmers who had not adopted the tsotso stove even if they were now aware of its benefits. Use of firewood is the major cause of damage to carbon sinks, the project encouraged farmers to plant more trees to replace the cut down trees but the rate at which tree were grown. In all project wards, researchers observed new trees planted by farmers both fruit trees and wood trees.

Water: Source of Drinking Water: The Most commonly used source of water by interviewed hh are protected wells (37%), tube well borehole (28%) and unprotected well (20%). Piped water and spring, rope and washer are some of the sources minimally used mostly in Mutasa. It was worrying to note that farmers still consumed water from unsafe sources. Most of the water sources (41%) were installed by family followed by DDF (34%), some 8% by community, others by neighbors (6%), NGOs (5%) while DAPP installed 4% of them.

Location of Source of Water: Less than half (51%) of the sources were reportedly located away from the farmers' dwelling place while 21% were in the farmers' yard, 13% in the community, 6% in the dwellings and another 6% at the neighbors.

Distance: Most the sources (40%) were within 200m, while 26% were between 401 and 601m, 11% were between 201 and 400 and some (3%) were between 1km and 2km.

Time taken: About half of the sources took 15 to 30 mins to fetch water, while 44% took less than 15mins and 4% took more than hour.

WASH

Sanitation Type: A quarter (25%) of the hh used pit latrine with slab while 20% used BVIP, 15% upgradable and 11% practiced open defecation. Only 10% constructed facility as result of DAPP Project education.

Handwashing: Most farmers (97%) washed hands before eating and after cooking while 53% farmers interviewed reported washing hands before cooking, 4% washed before breast feeding and while 1% after changing nappies and another 1% didn't wash a hands at all. Hand washing practice was high since not all the hh had babies.

Handwashing method practiced: Above half (61%) of the interviewed farmers practiced run to waste with water only, 15% communal dish water and soap, 12% communal dish with water only. Farmers still practiced unsafe handwashing was still low.

Open Defecation: In Mutasa there was 1% likelihood of men and women, boys and girl to practice OD while in Gutu, 22% likelihood for men and women and 31% likelihood for boys and girls to practice OD.

*Waste Management***:** Only 21% of the interviewed hh had dishracks, rubbish pits and tippy taps. Of these 31% were among those from Mutasa and 12% among those from Gutu.

There other project that contributed to WASH in the two districts. In Mutasa, there was a C-WASH project that preceded the UNEP project, hence WASH awareness was slightly more than Gutu.

Government of Zimbabwe was implementing demand led WASH programme through the country where hh were encouraged to build their own facilities. This was a paradigm shift from previous approaches which created donor dependency by provision of materials. DAPP-UNEP theory of change also which had emphasis on software rather than hardware was relevant.

OUTPUT A: AGRICULTURAL AND CLIMATE SMART PRODUCTION/CONSUMPTION SYSTEMS

CROPS GROWN

Table 5: Crops Grown

Most interviewed farmers grew two cereals maize (97%) and rapoko (23%); legumes grown ground nuts (51%) and round nuts (33%); Pulses: Sugar beans (34%) and cow peas (7%) as well as sweet potatoes (34%). Sorghum, tobacco, cotton, soya beans, sunflower and millet were not grown by interviewed farmers. However, in FGDs some farmers in Gutu reported growing millet albeit in small quantities. Government

Crop	Gutu	Mutasa	Overall
Maize	100%	93%	97%
Millet	0%	0%	0%
Rapoko	38%	7%	23%
Ground Nuts	82%	20%	51%
Cow Peas	10%	3%	7%
Sugar Beans	2%	66%	34%
Round Nuts	56%	9%	33%
Sweet Potatoes	54%	14%	34%

Area Planted

Cereals:

Maize: In 2017 season most of the interviewed farmers (66%) grew maize on 0.5-1ha plots, 24% grew maize on less than 0.5ha and 8% grew it on between 1ha and 1.5ha and only 1% grew it on between 1,5ha and 2ha. In the 2018 Season, 59% of the interviewed farmers planted between 0.5ha and 1 ha of land. 34% of the farmers planted on land less than 0.5ha and 7% planted on plots of 1ha to 1.5ha in size.

Rapoko: Most of the interviewed farmers that grew rapoko in the 2017 and 2018 season (85% and 97% respectively) planted on less than half a hectare of land. Only 15% in 2017 and 3 % in 2018 planted an area over half an hectare to a hectare.

Legumes: Most of the farming for legumes (groundnuts and round nuts) was done on less than half a hectare by 95% of the farmers interviewed in both the 2017 and 2018 Seasons. Only a few, 2% of the interviewed farmers grew round nuts on more than 0.5ha to 1ha of land. For groundnuts, only 5 % of the farmers in both the 2017 and 2018 season planted more than half a hectare.

Pulses: Most cropping for pulses (95%) was done on less than half a hectare in both seasons. The farming was done on area over half a hectare, in the case of Cow peas more popular in Gutu that in Mutasa, by only 5% of the farmers in the 2017 farming season. Conversely, for Sugar beans, more popular in Mutasa than Gutu, 5% of the farmers also planted on more than half a hectare of land.

Amount of seed used

Most of the cropping was done with less than 10kg of seed with the exception of maize, for which the amount of seed used ranged from 10 to 40kg. Seventy three percent of the interviewed farmers in Gutu and 71% of those interviewed in Mutasa used between 10-25kg of maize seed.

Cereals

Maize: About Forty two percent (42%) of the interviewed hh planted less than 10kgs of maize seed while 46% planted between 11 and 20kgs of maize seed. Of those who planted less than 10kgs, 51% are of those interviewed in Mutasa and 34% of those interviewed in Gutu. For those that planted 11 to 20kgs of seed, 47% are hh interviewed in Mutasa and 45% interviewed in Gutu. Of all interviewed hh only 12% used over 20kgs. Maize is still the dominant crop grown by farmers from both districts despite farmers realizing that failure rate was increasing. There was no much change in seed quantity planted between 2016/17 to 2017/18 farming seasons.

Rapoko: In both districts, most farmers (77%) do not grow Rapoko. 85 % of the farmers that grew rapoko planted seed between 1 and 2kgs. Of those who planted 1-2kgs, 80% were among those interviewed in Mutasa and 85 % were among those interviewed in Gutu. Other small grain cereal crops like sorghum and millet were not grown among the interviewed farmers in both districts.

Legumes

Ground Nuts: Most interviewed hh (83%) planted 1 to 10kgs of seed, followed by 16% who planted 11-20kg; only 1% planted above 20kg. Generally, farmers in Gutu planted more ground nuts than those in Mutasa. The amounts of seeds sown did not increase much between 2016/17 and 2017/2018 seasons.

Round Nuts: Ninety seven percent of surveyed hh who grew round nuts used less than 10kgs of seed while 3% percent planted between over 10kgs. 97% of those interviewed in Gutu and 100% of those interviewed in Mutasa.

Pulses

Cow peas: All of the surveyed hh who grew cow peas used less than 5kg of seed in both the 2016/17 and 2017/18 seasons.

Sugar Beans: Over 80% of the interviewed farmers who grow sugar beans sowed between 1 to 10kgs of seed while the remaining 20% of the farmers reported planting more than 10kg of seed in both Districts.

Source of Seeds Planted

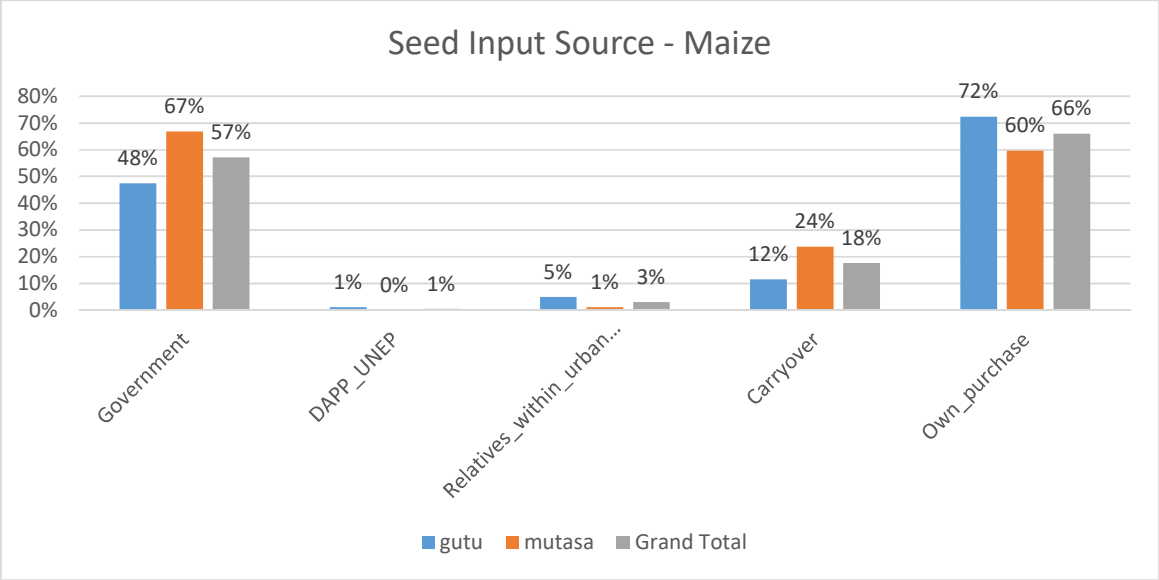


Figure 5: Source of Seed

Cereals

Maize: The interviewed farmers indicated that their first major Source of Seed for maize production is by own purchase followed by Government support. Of the interviewed farmers who grow maize, 66% indicated that they purchased their own seeds and used between US$11 and US$50. Fifty-seven percent of the farmers also indicated that they receive seeds from Government. A few farmers, 12% in Gutu and 18% in Mutasa used seed carryover from the previous farming season.

Rapoko: Most (90%) rapoko seed used for production was carryovers from the previous season. The remaining 10% consisted of support from the DAPP-UNEP Programme (5%) and the other five percent was received from relatives in the rural areas.

For Legumes and Pulses, seeds used for production were from carryover from the previous season. Seeds for legumes and pulses were more resilient to pests therefore they are easily kept, therefore farmers did struggle to get these.

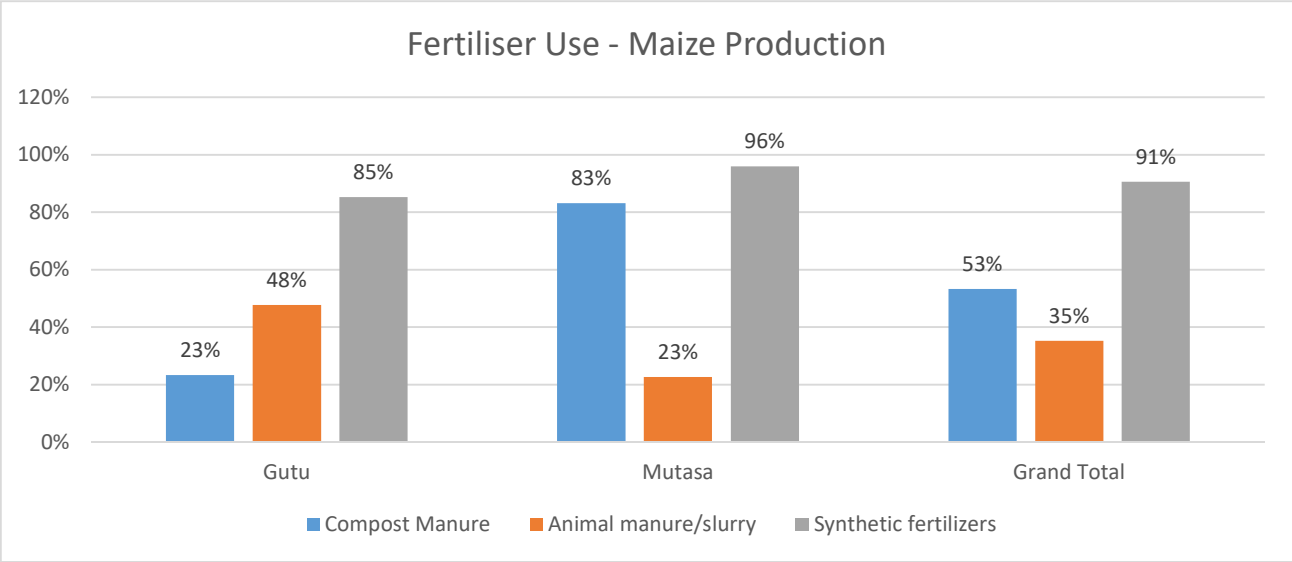
Source of Water for Agriculture Production

All crop production (99.9%) in project wards was rain-fed with the exception of three farmers two from Gutu and another one from Mutasa who occasionally use irrigation for their maize production. In Mutasa, there were perennial springs that are at water of river where farmers just connect pipes and get water for irrigation through gravity. Rainwater harvesting must be encouraged to assist farmers setting up small scale irrigation schemes particularly drip irrigation. At the time of the survey, farmer met by researchers during FGDs were very worried that their early crop were facing moisture stress as there were no promise of rain in the sky. "*Kana tarima kudai tongotarisa kunaMusiki kuti atipe mvura, makore ano mvura yacho haichanayi nenguva*" (When we have planted like this we look up to the Creator, these years we no longer receive rainfall in time), bemoaned one elderly farmer in Gutu, Ward 37. Farmers reported suffering huge losses due to their heavy relaiance on natural rainfall for agriculture. Most gardens in Gutu had failed due to lack

water and in Mutasa farmers invaded wetlands and mountains in search of water for agriculture production. ,

Fertilizer Used

Figure 6: Fertilizer Use



Field data (table 10) below on the type of fertilizer applied in crop production was gathered for six crops for which farmers applied fertilizers. Synthetic fertilizers were the most (91%) commonly used fertilizers in maize production, 85% in Mutasa and 91% in Gutu. A close second were inorganic fertilizers, compost and animal manure. Slightly above half (53%) of the farmers reported using compost manure in maize production. Of the 53%, the practice was more in Mutasa with 83% than in Gutu 23% whereas 35% utilise animal manure/slurry distributed 48% of the farmers interviewed in Gutu and 23% of those interviewed in Mutasa.

Table 6

Maize - Qty of Fertilizer (kgs)	Gutu	Mutasa	Grand Total
100_350	7.28%	64.71%	37.69%
22_50	49.01%	2.35%	24.30%
50_100	39.74%	31.76%	35.51%
less_22	3.97%	0.59%	2.18%
Other	0.00%	0.59%	0.31%
Grand Total	**100.00%**	**100.00%**	**100.00%**

Most interviewed farmers (74%) indicated that they purchased most of their fertilizer. Of these, the 74%, more (77%) were from Gutu and 70% in Mutasa. Over half (61%) of the farmers used between 22 and 100kgs of fertilizer. In this bracket, 88% were from Gutu and 34% Mutasa. 37% of the farmers used more than 100kg of fertilizer. Of the 37%, 64% were from Mutasa and only 7% from Gutu.

Crop Yields, Cereals: Maize

In 2016/17 season, just over half (55%) of the interviewed farmers produced maize above half a ton but below 2t while 40% produced below 1/2t and only 5% produced above 2t. In 2018, the maize yields realized by farmers in the project were almost similar to those of the previous year with a difference of 1% increase for farmers who produced 1/2t to 2t (Table 12). Maize was the staple food for the two districts. While the increase was small, from FGDs with farmers it was reported across all districts that target farmers' hh were food secure[20] and were not receiving food aid.

Table 7: Maize Yields 2016/7

Maize Yields 2016/17											
	Gutu					Mutasa					
Yield (kgs)	0 to 0.5ha	0.5 to 1ha	1 to 1.5ha	1.5 to 2ha	Gutu Total	0 to 0.5ha	0.5 to 1ha	1 to 1.5ha	2 to 4ha	Mutasa Total	Total
<501 or (blank)	71%	40%	8%	0%	46%	48%	27%	0%	0%	34%	40%
501-2000	29%	56%	69%	67%	49%	51%	69%	78%	0%	61%	55%
>2001	0%	4%	23%	33%	5%	2%	3%	22%	100%	5%	5%
Grand Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 8: Maize Yields 2017/8

Maize Yields 2017/18											
	Gutu					Mutasa					
Yield (kgs)	0 to 0.5ha	0.5 to 1ha	1 to 1.5ha	1.5 to 2ha	Gutu Total	0 to 0.5ha	0.5 to 1ha	1 to 1.5ha	2 to 4ha	Mutasa Total	Total
<501 or (blank)	65%	39%	8%	0%	43%	46%	32%	0%	0%	35%	39%
501-2000	35%	58%	77%	100%	54%	53%	62%	80%	0%	59%	56%
>2001	0%	3%	15%	0%	3%	1%	5%	20%	100 %	6%	4%
Grand Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100 %**	**100%**	**100%**

Cereal: Rapoko Yields

Close to half (49%) of the interviewed farmers produced between 300kg and 500kg of Rapoko while 39% produced less than 100kgs; 5% produced 1/2t to below 900kg, 1% produced 700kg to 800kg and another 1% produced over a tone of Rapoko. This year the same almost half of farmers (49%) produced between 100kg to 299kgs while 39% produced less than a 100kgs; 17% produced between 200 and 300kgs and 5 % produced above 300kgs.

[20] Food secure meant that a hh was able to produce enough own food from agriculture to feed its members until the next harvest period.

Table 9: Rapoko Yields 2017/8

Rapoko Yields 2017/18							
	Gutu		Gutu Total	Mutasa		Mutasa Total	Total
	Area Planted			Area Planted			
Yield (kgs)	0 to 0.5ha	0.5 to 1ha		0 to 0.5ha	0.5 to 1ha		
<100 or (blank)	31%	20%	30%	80%	100%	85%	39%
100-299	56%	40%	55%	20%	0%	15%	49%
300-499	3%	40%	6%	0%	0%	0%	5%
500-699	6%	0%	6%	0%	0%	0%	5%
700-899	2%	0%	1%	0%	0%	0%	1%
>1100	2%	0%	1%	0%	0%	0%	1%

Average Cereal Yields for 2016/7 and 2017/8 Seasons

Average cereal yield for 2016/7 season was 909kg while that for 2017/8 was 847kg. There was a decline in both maize and Rapoko yields. Farmers had potions of their maize fields which they practice CA while the rest were be under conventional farming. Absence of farming records at household levels made it difficult to determine how much yield was realized through CA only. All yields recorded were estimates by Agritex officers who conducted household interviews.

Table 10:Average Cereal Yields for 2016/7 and 2017/8 Seasons

	2016/7 Season			2017/8 Season		
Yield (kgs)	Gutu (n=181)	Mutasa (n=182)	Grand Total	Gutu (n=181)	Mutasa (n=183)	Grand Total
Maize Total Yield(kgs)	154,240.00	163,310.00	317,550.00	137,225.00	160,180.00	297,405.00
Rapoko Total Yields (kgs)	11,875.00	660.00	12,535.00	9,770.00	960.00	10,730.00
Cereal Total Yields (kgs)	**166,115.00**	**163,970.00**	**330,085.00**	**146,995.00**	**161,140.00**	**308,135.00**
Average Total Yield (Cereals)	**918**	**900**	**909**	**812**	**881**	**847**

Average Legumes Yields for 2016/7 and 2017/8 Seasons

Average yields for Legumes were 107kg for the 2016/7 Season and the yields declined to 70kg for the 2017/8.

Table 11:Average Legumes Yields for 2016/7 and 2017/8 Seasons

Yield (kgs)	2016/7 Season			2017/8 Season		
	Gutu	Mutasa	Grand Total	Gutu	Mutasa	Grand Total
Groundnuts Total Yield(kgs)	**23513**	**3345**	**26858**	**14383**	**4020**	**18403**
Round nuts Total Yields (kgs)	**11330**	**720**	**12050**	**6492**	**815**	**7307**
Legumes Total Yields (kgs)	**34,843.00**	**4,065.00**	**38,908.00**	**20,875.00**	**4,835.00**	**25,710.00**
Average Total Yield (Legumes)	**193**	**22**	**107**	**115**	**26**	**70**

Average Pulses Yields for 2016/7 and 2017/8 Seasons

Yields for pulses averaged 60kg and 43 kg for the 2017 and 2018 seasons respectively.

Table 12:Average Pulses Yields for 2016/7 and 2017/8 Seasons

Yield (kgs)	2016/7 Season			2017/8 Season		
	Gutu	Mutasa	Grand Total	Gutu	Mutasa	Grand Total
Cow Peas Total Yield(kgs)	**11330**	**720**	**12050**	**6492**	**815**	**7307**
Sugar Beans Total Yields (kgs)	**260**	**9435**	**9695**	**106**	**8077**	**8183**
Pulses Total Yields (kgs)	**11,590.00**	**10,155.00**	**21,745.00**	**6,598.00**	**8,892.00**	**15,490.00**
Average Total Yield (Pulses)	**64**	**56**	**60**	**36**	**49**	**43**

CA Methods Practiced per Crop

Reported farming practices per crop between 2017 and 2018 agriculture season were either conservation, conventional or mixed methods. CA practices decreased slightly across all grown crops between the two seasons. While conventional practices also decreased for cereals and legumes only and increased slightly for pulses between the two seasons under review. Mixed farming methods increased per crop for cereals and legumes for the periods under review.

Table 13: Farming Method

Farming Method						
Crop	**Distr**	**N**	**N**	**Conservation**	**Conventional**	**Mixed**

	ict	2016/2017	2017/2018	2016/2017	2017/2018	2016/2017	2017/2018	2016/2017	2017/2018
Maize	Gutu	181	180	8%	9%	55%	51%	37%	39%
	Mutasa	172	177	71%	72%	5%	4%	23%	23%
	Average			**40%**	**41%**	**30%**	**28%**	**30%**	**31%**
Rapoko	Gutu	69	63	17%	22%	75%	62%	7%	16%
	Mutasa	13	21	85%	67%	0%	5%	15%	29%
	Average			**51%**	**45%**	**38%**	**34%**	**11%**	**23%**
Ground Nuts	Gutu	148	142	11%	13%	85%	80%	3%	6%
	Mutasa	38	45	71%	56%	8%	0%	21%	44%
	Average			**41%**	**35%**	**47%**	**40%**	**12%**	**25%**
Cow Peas	Gutu	18	17	33%	41%	44%	47%	22%	12%
	Mutasa	7	8	57%	37%	0%	0%	43%	62%
	Average			**45%**	**39%**	**22%**	**24%**	**33%**	**37%**
Sugar Beans	Gutu	5	5	60%	60%	20%	40%	20%	0%
	Mutasa	122	124	43%	39%	5%	5%	50%	56%
	Average			**52%**	**50%**	**13%**	**23%**	**35%**	**28%**
Round Nuts	Gutu	101	94	13%	18%	79%	73%	7%	9%
	Mutasa	17	18	94%	94%	5%	0%	0%	6%
	Average			**54%**					**8%**

CA Farming Skills Learnt in the Project

Most farmers (90%) learnt conservation agriculture, 65% learnt intercropping market gardening and 44% pest control livestock production while 25% learnt postharvest management.

Table 14:CA Farming Skills Learnt in the Project

Farming Skills obtained	Gutu (n=177)	Mutasa (n=183)	Grand Total (n=360)
Conservation farming	89%	91%	90%
Livestock production	0%	49%	25%
Market gardening	23%	64%	44%
Postharvest management	0%	38%	19%
Intercropping	47%	83%	65%
Pest control	6%	81%	44%
Fish farming	0%	23%	11%

Farming Skills obtained	Gutu (n=177)	Mutasa (n=183)	Grand Total (n=360)
Crop rotation	1%	0%	0%
Horticulture	1%	0%	0%
Vegetable processing	0%	0%	0%
Nutrition	0%	1%	1%
Agroforestry	0%	1%	0%

Other Farmer to farmer extension trainings acquired

More than half of the interviewed farmers reported to have been trained in the lead farmer programme while the remainder 47% were not. Lead Farmer programme is a GoZ porgramme implemented by Agritex. Some of the farmers who claimed to have been trained in the programme might have failed to distinguish the programme from the farmers' club programme as they claimed to have been trained by DAPP. Most of those 63% claimed to have been trained by DAPP and 1% by Christian Care.

Farming Skills applied by respondents

Of the above respondents' learnt skills only CA (35%), followed by intercropping (10%), composting (8%) seem to have been applied by interviewed farmers. However according to FGDs and KIIs, farmers were trained in the following farming skills among others and there was wide usage.

i. Zero tillage methods both manual and mechanized ie potholing and use of riper tines
ii. Contour ploughing
iii. Compost making
iv. Mulching
v. Agro-forestry
vi. Afforestation and reforestation through planting of new trees, grafting and budding
vii. Crop rotation
viii. Intercropping
ix. Apiculture

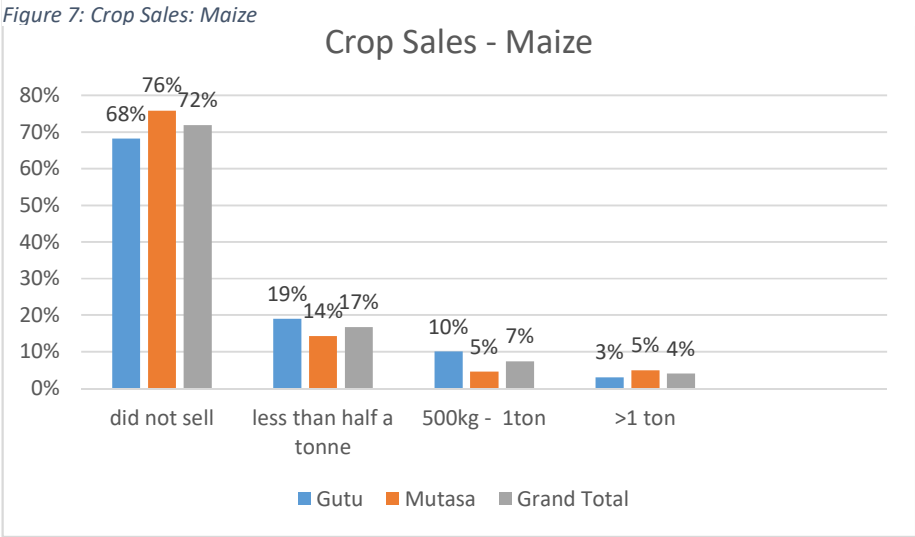
Farmers who participated in FGDs demonstrated sufficient knowledge as well demonstrated skills through existing demonstration plots as well as prepared individual fields visited by researchers during field work. Those interviewed were able to explain CA principles as well benefits derived both for sustainable human life as well for the environment. An album of picture from the field will be attached to the report.

Labor for the fields

Most of the field labor (97%) was reportedly provided by family members while 20% was provided by hired servants, 3% by neighbors and 1% by club. Family members were mostly responsible for labor provision while hired labor was second. From FGDs, elderly participants reported that they got help from club family members as well club or community members in their gardens or fields.

Crop yields and usage

Figure 7: Crop Sales: Maize

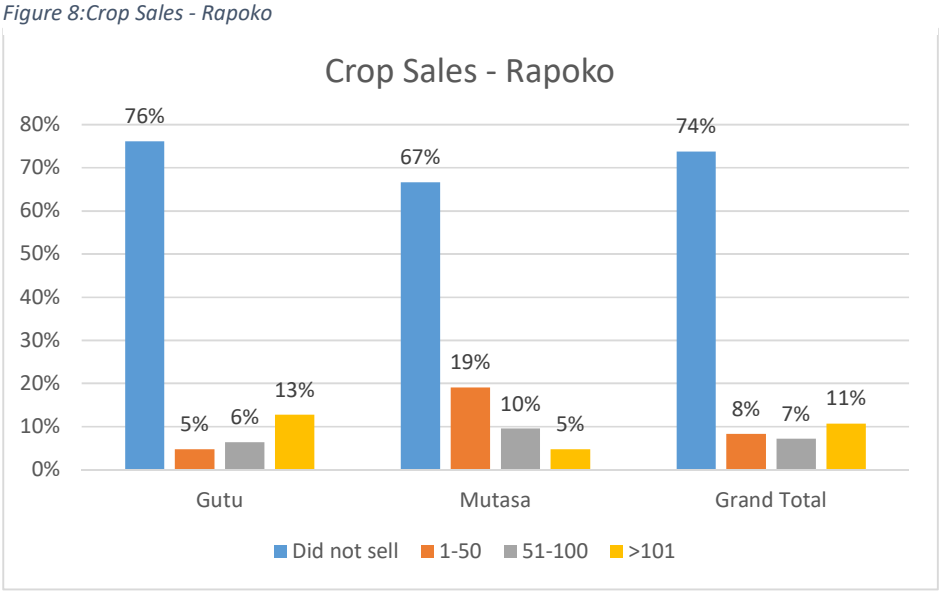


Crop Sales, Cereals

Maize: Most interviewed farmers (72%) did not sell any maize both in the 2016/7 and 2017/8 Seasons. Of the remaining 28% that sold their crops, 17% sold less than half a ton, 7% sold between 500kg to a ton and only 4% sold more than a ton.

Most of the interviewed farmers (44%) sold their crops in their local community. From this 44%, 48% were from Gutu and 44% in Mutasa. 31% of the interviewed farmers sold their maize through the Grain Marketing Board – 44% in Gutu and 18% in Mutasa. 23% sold their crops in the local market place. Of which more came from Mutasa 35% and fewer from Gutu (10%). The selling price varies from $0.10/kg to $0.50/kg. 22% of the farmers that sold their crops sold for in a price range between $0.19/kg and $0.29/kg. About 11% sold between $0.29 and the official GMB Price of $0.39.

Figure 8:Crop Sales - Rapoko



Rapoko: Most rapoko gorwers (74%) among farmers who were interviewed the very few farmers did not sell. Among these 76% were from those interviewed in Gutu whikle 67% were from those interviewed in Mutasa. 11% sold more than 100kgs – most of which came from Gutu (13%) and a few from Mutasa (5%). Of the sales made the price ranged between $0.30 and $0.75/kg. The main market for rapoko stated by the interviewed farmers was the local community. The crop sales and prices did not vary across the two farming seasons under review (2016/7 and 2017/8).

Legumes

Groundnuts: 90% of the farmers who grow groundnuts did not sell any groundnuts in both farming seasons under review. The few (10%) who sold legume sold between 10 and 100kg for a price between $0.30 to a $1.00 for a kg.

Roundnuts: Most (90%) of the interviewed farmers did not sell any round nuts. Of the 10% who sold, charged $0.20/kg to $0.70/kg and sold quantities between 15 and 200kg.

Pulses

Cow peas: About a quarter of farmers (26%) among those interviewed grew cow peas and none recorded any sales. Among these 69% growers from Gutu.

Sugar Beans: 35% of the interviewed farmers grew sugar beans, most of these (96%) of the farmers that grow Sugar Beans were from Mutasa District. From this number, only 31 percent sold sugar beans.

Surplus for Sell as result of DAPP-UNEP Intervention

Farmers that had surplus agricultural produce to sell were asked if their success was result of the DAPP-UNEP Intervention. Of the few farmers interviewed that recorded a surplus at least 50% across the 3 crop categories attributed their increase in productivity to the Project. Specifically, the farmers noted that the skills acquired through the training received from the DAPP-UNEP project had been instrumental in improving their farming.

For some farmers it was the inputs support that had been rendered by the Project or accessed from seed houses facilitated by the project improved their productive capacity. Yet for other farmer it was the prospect of money which motivated as they learnt about accessing markets for their agricultural produce.

Extension Services Offered by Government Departments

Table 15:extension services from Government Departments

extension services from Government Departments			
Services	gutu	Mutasa	Grand Total
Livestock Production	58%	41%	49%
Irrigation	0%	9%	4%
Crop production	99%	98%	99%
Veterinary Services	12%	15%	14%

Of the government provided extension services most were crop production (99%), followed by livestock production 49% then veterinary services (14%) and irrigation department (4%). Some of these agriculture departments have been underfunded which made them very too weak to support rural farmers.

Crop Production Extension Services

Table 16:Access to Crop Production Extension Services

Access to Crop Production Extension Services			
Months	Gutu (n=181)	Mutasa (n=182)	Grand Total
0 to 3 months	87%	95%	91%
3 to 6 months	5%	1%	3%
6 months and above	8%	5%	7%

Most farmers (91%) interviewed had received extension services within 3 months preceding evaluation, while 7% had last received more than six months prior to the evaluation. Only 3% received services between three to six months before the evaluation.

KII with District Agritex Officers indicated that extension services to farmers had faced a number of challenges which included the volatile political atmosphere, politicization of agriculture inputs, months leading to July harmonized elections and subsequent changes in Government ministry structures where most agriculture departments were affected including extension workers at ward level. Resource constrains have always been faced by the department in long time. Political disturbances were also reported by DAPP farming instructors who had to suspend meetings with farmers for up to two months as political campaigns reached fever heights. Time for farming activities was occupied by political meetings organized by local leaders.

Restructuring of Agritex saw DAPP trained Agritex extension workers in project wards 8 and 37 of in Gutu being posted elsewhere. The ward nutrition coordinator for ward 9 was also reassigned Replacements took months such that at the time of the evaluation some of the new extension workers were still to settle.

Table 17: Extensions Services Provider

Extension Services	Gutu	Mutasa	Grand Total
LPD	0%	3%	1%
Vet Officer	2%	8%	5%
Agritex Extension Worker	86%	95%	90%
Private Sector	0%	1%	1%
DAPP UNEP	54%	84%	69%

Most farmers interviewed reported receiving 90% extension services from Agritex, 69% from DAPP-Officers, 5% from veterinary services and 1% each from LPD and private sector respectively. FGDs with farmers and KII with key stakeholder officials indicated that DAPP officer were most available to the groups than Agritex extension workers. This was acknowledged also by some of the Government officials.

Table 18:Last Accessed Extension Services

Last Accessed Extension Services

	Gutu	mutasa	Grand Total
Agroforestry	0%	1%	0%
Crop rotation	0%	1%	0%
Soil and water conservation__	58%	74%	66%
Planting methods	96%	79%	87.5%
Crop types	8%	23%	4%
Harvesting methods	0%	32%	16%
Harvest storage methods	1%	29%	15%
Crop markets	1%	9%	5%

Membership to FCs: Most of the respondents (95%) were members of the FC while the remainder, 5% were not participating. Reasons for non-participation given included no joining fee (11), not eligible, not registered (2), not willing (3) and one had poor health. Registration to FC was free only ISALs membership required contribution as confirmed by farmers in FDGs and Project staff KIIs.

Livestock Production

Cattle owned: Over half of the interviewed farmers (57%) owned 1 or no cattle at all while 28% owned from one to 5 five beasts and 11% owned between 6 and 10. Only 4% owned more than 11. Generally, farmers from Gutu District owned more cattle as compared to their Mutasa counterparts. According to FGDs with farmers in Mutasa, land and pasture shortages in Mutasa discourage farmer from livestock production as they cannot practice free range.

Table 19:Current Number of cattle owned

Current Number of cattle owned	Gutu	Mutasa	Grand Total
<1 or (blank)	34.25%	79.44%	56.79%
1-5	40.33%	16.11%	28.25%
6-10	18.23%	3.89%	11.08%
>11	7.18%	0.56%	3.88%
Grand Total	**100.00%**	**100.00%**	**100.00%**

Most of the interviewed farmers (74%) did not have any increase in their heads in the 12 months preceding the evaluation while the remainder (23%) had increase in cattle. Most of the cattle increases (95%) were due to births while 5% were to purchases. The increases were more in Gutu than in Mutasa. Attrition: For most of the interviewed (89%) there was no attrition while 11% there was mostly due to deaths followed by slaughter.

Most cattle (99%) in both districts were on free range. A few of the interviewed farmers (8%) experienced cattle deaths. Most of the interviewed farmers (77%) had last received livestock extension services within three months preceding the evaluation. Only 20% had not received extension services for over 6 months. Most of the extension services were provided by LPD together followed by DAPP-UNEP project staff.

Table 20: TIme last accessed extension service/s

Indicate on last accessed extension service/s	Gutu	Mutasa	Grand Total
Cattle dipping	84%	25%	54%
Vaccination	18%	33%	25%
Treatment on disease outbreak	12%	7%	10%
Livestock Breeding training	2%	50%	26%

According to interviewed farmers most cattle (94%) did not have water during the last drought season only 6% had access to water. Most of these cattle (81%) accessed water from the rivers, communal dam, (5%), spring (4%), or borehole 3%. Cattle water was a challenge for rural farmers. Very few farmers (2%) had sold any cattle by the time of the evaluation. The sales were made to private individuals. In most cases cattle buyers were reportedly coming to buy direct from the farmers.

Most of the interviewed farmers (85%) kept chicken, only 15% sold some of their chicken to neighbors. A few of the farmers (2%) sold rabbits to neighbors, the rest did not keep nor sell.

Most interviewed farmers (61%) had received training in livestock management while 39% had not.

Table 21: Livestock management training received in the past 12 months

Have you received any form of livestock management training in the past 12 months	Gutu	Mutasa	Grand Total
No	30.68%	47.19%	38.98%
Yes	69.32%	52.81%	61.02%

Of those who received training over half had training in animal health, while 29% were trained in feeding and 26% in breeding. Most of those trained in animal health were from Gutu while most of those who had training in breeding nutrition were from Mutasa. Only 1% had training on grazeland management.

Table 22: Type of Livestock Management Training Received

Training Received	Gutu	Mutasa	Grand Total
Animal Health	98%	16%	57%
Breeding	1%	51%	26%
Nutrition	5%	53%	29%
Graze land Management	2%	0%	1%

Fodder/Pasture Production

A few (8%) of the farmer interviewed grew hey grass majority did not.

Aquaculture Production: Very few of the interviewed farmers (less than 2%) practiced aquaculture. These got the skills from GoZ extension workers and they bred breams. Little was sold.

OUTPUT B: FAMILY INCOME AND LIVELIHOOD OPTIONS IMPROVED FOR 2000 FAMILIES THROUGH CROP PRODUCTION, AGRO-PROCESSING AND MARKET LINKAGES

Current Livelihoods Options

Crop Products Processing

Very few of the interviewed farmers processed agriculture products before sale, eg ground nuts into peanut butter and sold to local market as well roast nuts

Slightly above half (51%) of the interviewed farmers received training in food processing. The training was facilitated by GoZ extension workers together with DAPP (80%) and DAPP only (18%). Farmers viewed the training as very helpful (56%) and helpful 44%. Only 20% reported to have access to markets as result of training from DAPP. Most interviewed farmers reported lack of access to good markets while 20% reported lack of market knowledge. And 10% lacked equipment and materials for co instruction of material data. The most common markets for local produce was still local market.

Livestock Products Processing

Most (84%) interviewed farmers did not receive any training in livestock products processing. 15% did receive from either DAPP or GoZ. The skills acquired through DAPP trainings included, breeding, hatching and slaughtering. Most of the farmers still did not have access to good markets save for few (8%). Local markets were the most relied on for agriculture produce.

Case Story: Mrs. Zhanda nee Mukundabuta, a widow who bit all the odds to become as successful farmer in her family.

Mrs. Zhanda is a widow who relocated to her parents' home area in Ward 11 of Mutasa District from Chivhu where she had been married. She went back to her parents' profession of farming and became the most successful farmer in her family thanks to DAPP-UNEP Project. She lives with her two teenage children who helps her with her farming. She joined DAPP-UNEP project FC and became an active member. While she had some knowledge of farming from her parents, she learnt to do farming as business through DAPP-UNEP project.

She has learnt to take advantage of her opportunities and local resources like 2ha of land she inherited from her parents. Among the projects she has ventured into as way of diversifying her livelihood options are chicken rearing, cattle (herd of 14), she has six cows and which have calves and produced at least 15l of milk daily enough for her hh needs and sell to neighboring Wattle Company workers. She has goats (36), at the time of evaluation she had just started on piggery on rabbits. She said she was not stopping equipped with knowledge she saw the sky as the limit. There is an accompanying video of her story which profiles her livestock projects. In the field crops she produced surplus maize while her gardening project produces for her family and the Wattle Company market. Video Link https://goo.gl/JKZc2Q

Her exhortation to other widows was *"People think that when a woman is widowed they engage in immoral practices for a living but, I have told myself that I can make it through hard and every other widow can do it"*

Horticulture Production

Garden Sizes and Assistance: Most farmers interviewed (77%) grew vegetables on garden less than half a hectare in size while 22% had gardens between 1/2ha and 1ha. Only 1% had more than 1ha size of garden. Most of the farmers (72%) reported receiving assistance mostly from DAPP and Government. According to FDGs, in both project districts land for gardening was not so much of the problem. Though some young families in Mutasa had challenges. The major challenge was access to water. In Mutasa, researchers observed that farmers mostly sited their individual gardens in the river beds or banks to access water even if they were aware of legal prohibitions. They cited steep terrain which made hauling water a big challenge for mostly women and the elderly. This produced running battles with EMA. No demonstration gardens were established in violation of EMA Act at the time of the evaluation, though individual farmers often disregarded the 30m distance mostly in Mutasa where the terrain is bad. In Gutu, evaluators observed a gulley encroaching 30m distance of Cheziya Nutrition Garden and not reclamation was being carried out. Farmers, particularly the elderly were not keen on stopping the gulley preferring to that they would have water close to the garden. Alternative sources of water for horticulture must be established to discourage streambank cultivation as law enforcement and education alone were not solving the problem of stream bank cultivation.

Vegetable groups trained to grow: Most interviewed farmers (72%) reported that they were trained to grow leaf vegetable while 24% were trained in root vegetables and only 4% in fruit vegetables. FGDs and nutrition garden visits revealed that farmers were growing mostly covo before the project but were introduced to other varieties which included: beetroot, lettuce, spinach, broccoli, okra, cassava, butternuts, carrots, potatoes, onions and tomatoes. According to the farmers' own testimonies, uptake was slow at first until they were taught how to cook these varieties. At the time of the evaluation, they were enjoying them and demand on the local market was increasing.

Interviewed farmers grew the following root vegetables: carrot, onion sweet potatoes. Most farmers produced carrot (60%), while half of them (51%) grew onions; a few grew sweet potatoes. According to FGDs participants DAPP introduced beetroot and cassava and taught farmers how to prepare and eat it. At first, farmers reported to have resisted these new varieties but later adopted them.

Leaf Vegetables: Most interviewed farmers reported growing traditional leaf vegetables such as covo (68%), rape (41%), tsunga (19%). DAPP introduced spinach (44%), lattuce, broccoli and cabbages (according to FGDs). Farmers diversified and increased their dietary diversity.

Table 23: Vegetable Varieties Grown

Orange Vegetables Grown	Gutu	Mutasa	Grand Total
Root Vegetables			
carrot	47%	72%	60%
Onion	46.41%	55.56%	50.97%
Orange sweet potatoes	0%	5%	2%
Green Leafy Vegetables			
covo	88%	49%	68%
rape	44%	39%	41%
tsunga	12%	26%	19%
spinach	52%	37%	44%
lettuce	0%	13.11%	
Root Vegetables			
Tomatoes	49.17%	19.78%	34.44%
Cucumber	4.97%	2.76%	3.87%
Butternuts	26%	34%	30%
Green Beans	2.21%	3.31%	2.76%

Fruit vegetables. Interviewed farmers used to grow tomatoes only but DAPP introduced butternuts (30%), cucumbers (4%), green beans 3%), paper and okra which were slowly adopted at first

Vegetable Varieties Grown

The majority of interviewed farmers all grow covo (68%). From the 68%, more were from Gutu with 88% and 49% from Gutu. The second most popular vegetable was carrot which is grown by 60% of the farmers followed by Onion, Spinach and Rape which are grown by 51%, 44% and 41% respectively. The least popular among the vegetables were tomatoes at 34.4%, Pumpkins at 30%, tsunga at 19% and the bottom being Cucumbers and Green Beans which were grown by 4 and 3 percent of the farmers respectively.

Size of Garden

The Gardens of the majority interviewed farmers ranged in size between 0.1 and 0.5 ha for all the vegetable groupings. Less than five percent of the interviewed farmers used gardens over 0.5ha.

Fertilizer Use

Most of the farmers in horticultural production used compost manure as the preferred fertilizer. The farmers that applied mostly compost manure across the different vegetable groups. The farmers approx. 67% utilized between 2kg and 2,5kg per square meter. Fertilizer is a key factor in enhancing productivity in terms of higher yield in horticultural production. However, be that as it may, it is always important for the farmer to promote sustainable agriculture through the implementation of climate smart techniques like substituting the chemically formulated synthetic fertilizers in favour of inorganic fertilizers.

Horticulture Yields

The

Table 24: Horticulture Yields

Horticulture Yields (kgs)			
Orange Vegetables Grown	Gutu	Mutasa	Grand Total
Root Vegetables			
Carrot	**1229**	**1700**	**2929**
Onion	**3778**	**3919**	**7697**
Pumpkin	**1918**	**2211**	**4129**
Green Leafy Vegetables			
Covo	**7457**	**2200**	**9657**
Rape	**2543**	**1393**	**3936**
Tsunga	**655**	**766**	**1421**
Spinach	**2228**	**1070**	**3298**
Lettuce	0%	**383**	**383**
Fruit Vegetables			
Tomatoes	**5323**	**1625**	**6948**
Cucumber	**295**	**50**	**345**
Green Beans	**200**	**152**	**352**

Most interviewed farmers (73%) did not irrigate their horticulture crops. Over a quarter irrigated (27%). Of these most were among those interviewed in Mutasa (53%) and less than 1%from Gutu. In Mutasa farmers mostly took advantage of the topography to tap water from the springs in mountains to water gardens in valleys. In Gutu water was a major challenge such that most gardens were affected by seasonality of water sources. Where boreholes were installed there was no irrigation infrastructure.

Figure 9: Gutu Farmers present porduce to DAPP Staff in Gutu, Cheziya Garden

Figure 10: Farmers from Mvere B in Mutasa Desplay their Garden Produce during a FGD

Quantity Consumed

64% of all Horticulture Produced is consumed by the hh. This figure is constant across all horticultural varieties (Root, Leafy and Fruit Vegetables). From the 64% slightly more were from Mutasa (69%) and (58%) for Gutu. After subsistence, the interviewed farmers had a 37% surplus yield available for sale, processing or preservation, that is, 34% surplus for Mutasa and 38% for Gutu.

Quantity Sold

95% of Surplus Horticultural produce was sold. Of the 94%, more surplus was sold in Gutu (100%) and (95%) in Mutasa. The average price across the horticultural varieties is $0.54kg

Income Realized from Horticulture

For the interviewed farmers, approximately $6,100.00 was realized in the two target Districts. This translates to an income realization of $17 for a single cycle of Horticultural production.

Horticultural Production ver 2.do

Agro Forestry and Fruit Production

Most of the interviewed farmers (69%) use only 10% of their land for fruit production, while, 28% said do not use any of their land for fruit production. Only 3% use between 10 and 30 % of land for fruit production. Less than a 1 percent utilize 30 to 50% of their land for fruit production.

Table 25: fruit production

land do you use for fruit production (orchards)?	Gutu (n=180)	Mutasa (n=178)	Grand Total
10%	63.89%	74.72%	69.27%
10_30%	0.00%	5.62%	2.79%
30_50%	0.00%	0.56%	0.28%

None	36.11%	19.10%	27.65%

Fruit Varieties Grown

The Interviewed farmers grow 11 varieties of fruit trees across the two Districts. More than half of the interviewed Farmers (54%) indicated that they started to grow mangoes as a result of the DAPP-UNEP Project. From the mentioned 54%, More were from Mutasa (71%) and less were from Gutu (36%). About a third of the interviewed farmers indicated that they now grow Citrus fruits as a result of the project (42% from Gutu and 20% from Mutasa). Only 21% of the farmers indicated that they had grown Apples as a result of the Project. Of which, more were from Mutasa 33% and only 9% were from Gutu. About 10% of the Farmers grew Avocados, 13% from Mutasa and 7% from Gutu. Only 7% of the interviewed started Banana production as a result of the project. Of the 7%, 9% are from Mutasa and 5% are from Gutu. 5% of the farmers grew peaches and of the 5%, 7% were from Mutasa and 4% from Gutu. Only 1% of the famers grew Paw paw, Macadamia Nuts, Pineapples, guavas and plums.

Table 26:Fruit Varieties grown

Fruit Varieties grown as a result of the DAPP-UNEP Project	Gutu	Mutasa	Grand Total
Bananas	5%	9%	7%
Mangoes	36%	71%	54%
Apple	9%	33%	21%
Pineapples	0%	1%	1%
Citrus	42%	20%	31%
Macadamia nuts	0%	1%	1%
Peaches	4%	7%	5%
Avocado	7%	13%	10%
Pawpaw	0%	1%	1%
Guava	1%	1%	1%
Plums	0%	1%	1%

More than half (60%) of the farmers interviewed practiced wood production and 40% do not. Of the famers that practice forestry/wood production almost two thirds were trained through both DAPP-UNEP and the Government. The remaining one third was trained by DAPP-UNEP only. 95% of the wood producers grow the Eucalyptus variety and the remaining 5% are distributed evenly among the wattle and mahogany variety. All of tree production is practiced on less than half a hectare of land.

Figure 11: Tree Seedlings at Guvamatanga Garden, Gutu

Figure 12: Tree Seedlings at Mutasa FC

Of the farmers that practice wood production, only 23% received training in wood processing most of them (85%) were trained by both Government and DAPP-UNEP, 6% were trained by DAPP-UNEP only and 1% by the Government of Zimbabwe.

Table 27: Wood Processing Training

Training in wood processing	Gutu (n=135)	Mutasa (n=82)	Grand Total
No	92.59%	51.22%	76.96%
Yes	7.41%	48.78%	23.04%
Grand Total	**100.00 %**	**100.00 %**	**100.00 %**

Table 28:Wood Processing Training Provider

Training Provider	Gutu (n=15)	Mutasa (n=45)	Grand Total
DAPP-UNEP	26.67%	0.00%	6.67%
GoZ-DAPP	66.67%	93.33%	86.67%
GoZ only	0.00%	2.22%	1.67%
Other	6.67%	4.44%	5.00%
Grand Total	**100.00 %**	**100.00 %**	**100.00 %**

Half of the interviewed farmers indicated that they had been trained in green house emission reduction. Of the farmers that were trained, half were trained by DAPP-UNEP alone and slightly below half were trained by both DAPP-UNEP and the Government and only 2% had been trained by the Government alone. KII with both project staff and Government stakeholders indicated that, Department of Climate Change provided training to DAPP Staff and extension officers from the respective wards from Gutu and Mutasa Disitrict in GHG emissions reduction and use of the FAO, Ex-Act Tool for carbon emissions calculation. Participants reported having a general idea of how to use the tool because time was not enough. Both extension workers and DAPP field officers reported limited capacity in use of the tool. The trainer indicated that there was need for follow up training which would have fully capacitated the extension officers to be fully acquainted with data collection. Though DAPP project staff had limited understanding of climate change causes, they were able to disseminate information on climate change, mitigation and adaptation to farmers.

FGDs with farmers confirmed that information on climate change was taught however across all districts, there attribution of global warming and climate change to ozone depletion which not true[21]. GHGs, mainly carbon dioxide and methane are active GHGs responsible for global warming climate change. Reduction in carbon emissions was more relevant to the rural farmers than ozone depleting substances, though bad were mostly used by affluent urban populations and the ozone hole caused affect people in Polar Regions not known to rural farmers under consideration.

In view of the foregoing, while noting that DAPP took a good initiative in introducing climate change at grass roots level. In such an new adventure there are bound to be challenges of interpretation including translation of vocabulary and skills gaps, it recommended that DAPP put more emphasis on capacity building of project personnel as well a dedicated monitoring, evaluation and leaning officer for such projects.

Table 29:Trained in Green House Gas Emission Reduction

Were you trained in Green House Gas Emission Reduction	Gutu	Mutasa	Grand Total
No	51.11%	48.15%	50.00%
Yes	48.89%	51.85%	50.00%

Table 30:Green House Gas Emission Reduction Training Provider

Training Provider	Gutu (n=65)	Mutasa (n=41)	Grand Total
DAPP-UNEP	75.38%	12.20%	50.94%
GoZ-DAPP	24.62%	80.49%	46.23%
GoZ only	0.00%	7.32%	2.83%

[21] https://www.ucsusa.org/global-warming/science-and-impacts/science/ozone-hole-and-gw-faq.html#.XDBqrVUzbIV

OUTPUT C: DIETARY DIVERSITY AND GENERAL HEALTH IMPROVED BY TARGETED 2000 PEOPLE

More than 80% of the interviewed farmers indicated that their own crops were the major source of food. The remaining Farmers indicated that they purchased food, practiced barter trade, received food aid and some made payments for food in kind.

Table 31:HH main source of food

main source of food for this household before DAPP_UNEP Project	Gutu (n=179)	Mutasa (n=177)	Grand Total
Barter Sales	2.23%	1.13%	1.69%
Food aid	3.35%	1.13%	2.25%
Gift	0.56%	0.00%	0.28%
Livestock sales	1.12%	0.56%	0.84%
Own crops	65.36%	93.79%	79.49%
Payment in kind_	6.70%	0.00%	3.37%
Purchase	20.67%	3.39%	12.08%
Grand Total	**100.00 %**	**100.00 %**	**100.00 %**

Most hh (72%) indicated that they had been able to provide enough food to hh members before June, 2018. Of the 72%, most where from those interviewed in Mutasa 98%, and 46% were from those interviewed in Gutu. Farmers in Gutu were less food secure than those in Mutasa. 54% of the farmers interviewed from Gutu indicated that they did not have enough food before in June 2018.

Table 32:Sufficiency of food for HH before June

Were most of the households in this community able to provide enough food for their members before June	Gutu (n=181)	Mutasa (n=180)	Grand Total
No	54.14%	1.11%	27.70%
Yes	45.86%	98.89%	72.30%

Almost all interviewed farmers indicated that they faced vulnerability to food shortages as a result of rain failure and lack of agricultural inputs. A very few, less than 10% indicated other barriers to effective food production such as lack of draft power, poor soils, major diseases outbreaks and overpopulation.

Table 33: Barriers to food production

barriers that make most households unable to produce enough food after DAPP-UNEP Project	Gutu (n=121)	Mutasa (n=123)	Grand Total
Rain failure	50.41%	40.65%	45.49%
Crop failure	0.00%	0.81%	0.41%

barriers that make most households unable to produce enough food after DAPP-UNEP Project	Gutu (n=121)	Mutasa (n=123)	Grand Total
Lack of agricultural inputs_	44.63%	45.53%	45.08%
Lack of draft power	0.83%	0.00%	0.41%
Major diseases outbreaks	2.48%	0.00%	1.23%
Poor soils	0.83%	10.57%	5.74%
Too many people to feed	0.00%	0.81%	0.41%
Unplanned and unintended move	0.83%	0.00%	0.41%

For Adults 18+, , Most hh (60%) had managed to have access to two meals a day. Almost, one third of the farmers had just a meal[22] in a day. Less than five percent had accessed the or more meals. The hh had the same number of meals in the dry and wet season.

Table 34:meals did adults (18+) in your family /household eat on a typical day in the 2018 dry season

How many meals did adults (18+) in your family /household eat on a typical day in the 2018 dry season	Gutu	Mutasa	Grand Total
0	0.00%	0.55%	0.28%
1	59.67%	14.84%	37.19%
2	38.67%	79.12%	58.95%
3	1.66%	4.95%	3.31%
4 plus	0.00%	0.55%	0.28%

Table 35:meals did adults (18+) in your family /household eat on a typical day in the 2018 wet season

How many meals did adults (18+) in your family /household eat on a typical day in the 2018 wet season	Gutu	Mutasa	Grand Total
1	50.28%	14.29%	32.23%
2	48.07%	79.67%	63.91%
3	1.66%	4.40%	3.03%
4 plus	0.00%	1.65%	0.83%

Table 36:meals did female adults (18+) in your family /household eat on a typical day in the 2018 wet season

How many meals did female adults (18+) in your family /household eat on a typical day in the 2018 wet season	Gutu	Mutasa	Grand Total
1	48.62%	12.64%	30.58%
2	47.51%	81.32%	64.46%
3	1.66%	3.30%	2.48%
4 plus	0.00%	1.65%	0.83%
N_A	2.21%	1.10%	1.65%

[22] Meal: A portion of food that a household or its individual members eat to satisfy hunger (Health Harvest, 2nd Edition, FAO, 2015

For Children aged 6 to 17 years, most (47%) of the interviewed farmers hhs indicated that children from 6 to 17 years had access to at least two meals in a day. 20% of the hh had only managed a meal a day in the last seven days. Less than 10% had access to more than 3 meals in a day. The interviewed households had the same number of meals in both the 2018 wet and dry season.

Table 37:meals did the children 6 to 17 years in this household eat on a typical day in the 2018 dry season

How many meals did the children 6 to 17 years in this household eat on a typical day in the 2018 dry season?	Gutu	Mutasa	Grand Total
1	36.46%	5.49%	20.94%
2	37.02%	57.14%	47.11%
3	3.87%	12.64%	8.26%
4 plus	0.00%	2.75%	1.38%

Table 38:meals did the children 6 to 17 years in this household eat on a typical day in the 2018 wet season

How many meals did the children 6 to 17 years in this household eat on a typical day in the 2018 wet season?	Gutu	Mutasa	Grand Total
1	29.83%	2.76%	16.30%
2	42.54%	53.59%	48.07%
3	3.31%	14.92%	9.12%
4 plus	0.00%	4.42%	2.21%
N_A	24.31%	24.31%	24.31%

Meals consumed by infants less than 5 years: The majority of the households (61%) did not have infants less than five years old. Of the 31% that had infants, 16% indicated that their infants had access to more than 4 meals in the 7 days preceding the evaluation. 13% of the hh had managed at least two meals a day for their infants. Very few less than 2% had only managed one meal in a day. Therefore 15%

Table 39:meals did the infants less than 5 years in your household eat in a day in the past 7 days

How many meals did the infants less than 5 years in your household eat in a day in the past 7 days?	Gutu	Mutasa	Grand Total
0	0.55%	0.00%	0.28%
1	3.87%	0.00%	1.93%
2	23.76%	2.76%	13.26%
3	4.42%	8.84%	6.63%
4 plus	7.18%	26.52%	16.85%
N_A	60.22%	61.88%	61.05%

Food Groups (FGs) Consumed by HHs in Week

Most hh (94% and above) consume large grain cereal (maize), sugar products, vegetables, oils/fat and roots and tubers at least 3 days/week.

Dietary Diversity Scores

The Dietary Diversity Scores measure the ability to acquire a sufficient quality and quantity of food to meet all household members' nutritional requirements for productive lives. Among the 15 category food groupings it is expected that each member of the hh consumes at least five of the foods in at least three out of the 7-day week. From the interviewed farmers, 100% consume Large Grain Cereals which are the staple food in the Country.

After the staple crop, the second highest food group consumed were vegetables. 99% of the farmers indicated having consumed Vegetables on three plus days in a week. Large grains and Vegetables highly correlate since the traditional staple me is most cases in two parts. The same applies to oils/fat which most farmers 89% also consumed, Oils/Fat are usually applied in vegetables in standard meal preparation. Sugar Products were fourth ranked with over 85% of the farmers indicating that they consumed sugar products in three plus days during a week. The last food component to have a score above half was fish (51%). This averages at 87% of the interviewed farmers consuming at least five of the fifteen food groups in a week

Only 36% of the famers indicated consumption of fruit during a week.

The remaining food groups, (small grain cereals, roots and tubers. legumes, meat, poultry, dairy products, corn soya blend, edible insects and game meat) were consumed by less than a fifth of the interviewed farmers during a week.

Table 40: Dietary Diversity Scores

	Gutu			Mutasa			Average		
No. of Days/Week	0	1 - 2	3 Plus	0	1 - 2	3 Plus	0	1 - 2	3 Plus
Large Grain Cereals	0	1%	99%	0	1%	99%			100%
Small Grains Cereals	87%	11%	2%	61%	30%	9%	74%	21%	6%
Roots and Tubers	93%	6%	2%	26%	55%	19%	60%	30%	10%
Sugar Products	10%	7%	83%	4%	3%	93%	7%	5%	88%
Legumes	82%	15%	3%	12%	55%	33%	47%	36%	18%
Vegetables	1%	0%	99%	1%	1%	99%	1%	0%	99%
Fruits	49%	19%	32%	33%	28%	39%	41%	24%	36%
Meat	67%	28%	4%	40%	47%	13%	53%	38%	9%
Poultry	66%	31%	3%	18%	61%	21%	42%	46%	12%
Fish	90%	9%	2%	56%	4%	9%	73%	22%	51%
Oils/Fat	17%	5%	78%	0%	1%	99%	8%	3%	89%
Dairy Products	87%	2.21	11.05	57%	19%	54%	72%	10%	18%
Corn Soya Blend	100%	-	-	99%	1%	-	99%	1%	0%
Edible Insects	47%	28%	25%	79%	13%	8%	63%	20%	17%
Game Meat	100%	-	-	93%	4%	2%	97%	2%	1%

Conservation Agriculture Training Received

CA training received: All respondents reported having received CA training. Most of the training (84%) was provided by DAPP and GoZ while 11% was DAPP only and 4% GoZ only. Above half of

the training was rendered through demonstration plots (54%), while 43% was through FC lessons and 1% through field visits. FGDS with farmers confirmed that DAPP project staff worked closely with Agritex extension workers such that they had joint training sessions for the farmers most of the time. Even when they came at different times they often consulted complemented each other.

Table 41: Training in CA

Did you ever receive training in CA	Gutu	Mutasa	Grand Total
No	0.55%	0.00%	0.28%
Yes	99.45%	100.00%	99.72%
Grand Total	**100.00%**	**100.00%**	**100.00%**

Table 42: CA Training Provider

Training Provider	Gutu	Mutasa	Grand Total
DAPP-UNEP	20.81%	1.66%	11.02%
GoZ-DAPP	75.14%	92.82%	84.18%
GoZ only	2.89%	5.52%	4.24%
Other	1.16%	0.00%	0.56%
Grand Total	**100.00%**	**100.00%**	**100.00%**

Table 43: Training Methodology

Training Methodology	Gutu	Mutasa	Grand Total
At Workshop	0.56%	0.00%	0.28%
During field days	1.11%	1.65%	1.38%
Farmers clubs	25.00%	61.54%	43.37%
Through demonstration plots	73.33%	36.81%	54.97%
Grand Total	**100.00%**	**100.00%**	**100.00%**

Most respondents (79%) reported that they practiced CSA and the remainder 21% did not. Those who reported practice, the applied technics were given in table below. The most popular was pothole planting (69%), followed by crop rotation (67%), intercropping with legumes (44%), crop diversification (39%) and use of inorganic manure (36%).

Table 44: CSA techniques practiced

If, YES above which CSA techniques do you practice	Gutu	Mutasa	Grand Total
Using inorganic manure	7%	65%	36%
Pothole planting	55%	83%	69%
Mulching	4%	64%	34%
Inter cropping with legumes_	21%	66%	44%
Crop rotation	52%	81%	67%

Use of ripper tine/subsoilers	1%	16%	8%
reducing soil erosion	4%	60%	32%
Crop diversification	10%	67%	39%
Use of dibble stick/jab planter	0%	2%	1%
Using Maize stover for mulch	1%	43%	22%

Disaster Risk Reduction (DRR)

Most interviewed farmers (61%) were not aware of DRR structures in their communities. They might have interacted with civil protection committees and extension workers unaware that they are responsible for disaster management.

Table 45: DRR Structures in the Community

DRR structures in your community set up or strengthened by DAPP-UNEP?	Gutu	Mutasa	Grand Total
No	56.91%	67.03%	61.98%
Yes	43.09%	32.97%	38.02%

Table 46:Extent households were involved in the formulation or strengthening of the early warning system

Extent households were involved in the formulation or strengthening of the early warning system/mechanisms by DAPP-UNEP?	Gutu	Mutasa	Grand Total
don't know	9.60%	14.29%	11.93%
not involved	43.50%	24.00%	33.81%
somewhat involved	16.38%	22.86%	19.60%
Very great extent	30.51%	38.86%	34.66%

Over 50% of the interviewed farmers acknowledged that hhs were involved in the formulation or strengthening of the early warning system/mechanisms by DAPP-UNEP. However, for those that acknowledged involvement, 35% indicated that they had been involved to a very great extent and 20% noted that they had somewhat been involved in this process. More than a third of the respondents indicated that they had not been involved in the formulation of the warning systems and about 10% professed total ignorance about the matter.

On frequency of early warning messages (EWMs) received, over a third (37%) of the farmers indicated that they had not received any warning messages through the DAPP-UNEP Project in the last 12 months. 41% of the interviewed respondents received more than five early warning messages in the last 12 months. Slightly less than a fifth received less than five EWMs in the same period.

Most (82%) of the EWMs received were for veld fires. Less than 10% of the messages received were for droughts, cholera, cattle dieses and floods.

In comparison to the number of EWMs received before the Project, the interviewed a third of the acknowledged that the frequency of the messages was now higher. Conversely almost half of the

remaining farmers revealed that there had been no difference whilst others noted a decline in the EWMs in the same period. 17% of the respondents did not know if there were any changes in the EWMs.

Table 47: Number of messages

How does this number compare to number of messages you used to receive before the project?	Gutu	Gutu	Grand Total
Do not know	4.96%	26.32%	16.85%
Frequency is now Higher	57.02%	19.74%	36.26%
Frequency is now lower	0.00%	36.18%	20.15%
No Difference	38.02%	17.76%	26.74%
Grand Total	**100.00%**	**100.00%**	**100.00%**

Perceptions on Agricultural Risk and Disaster Risk Reduction

Reality of Climate change: Most interviewed farmers (66%) knew Climate change was not a myth. 25% did not have sufficient knowledge while 10% thought it was not real.

Climate change only affects people in developed countries: Above half all farmers interviewed (55%) believed that climate change only affected people in developed countries; only 23% did have this belief while 21% were not sure.

Climate change causes floods and droughts in Zimbabwe: Most farmers interviewed (93%) knew that climate change was responsible for weather extremes in Zimbabwe. Only 5% were not quite sure while only 1% were not affirmative.

Climate change is caused by greenhouse gas emissions: Majority of the interviewed farmer (71%) knew that GHG were responsible for climate change. About a quarter did not have sufficient knowledge while only 2% did not agree.

Tilling the land causes environmental damage and must be reduced: Most of the interviewed farmers (82%) were affirmative that environmental damage must be minimized; 11% did not agree while and 5% were not sure.

People with disabilities, were involved and consulted in community decisions about location and building of climate change: Most of the farmers interviewed (82%) felt it was important to involve vulnerable groups in decisions that affect them; 13 % did not agree mostly Gutu. Only 5% did not have sufficient knowledge.

Youths were involved and consulted in community decisions about location and building of climate change: Majority of the farmers (80%) reported that youths were involved in the project; 14% did not agree while 6% were not sure, only 1%

Women were involved and consulted in community decisions about location and building of climate change: Majority of the farmers interviewed (82%), agreed that women were involved in the project only 13% did not agree. The dominants of women through registers as well participation of women in FGDs was clear.

Communities can reduce climate change impact through conservation farming: Most of the interviewed farmers (92%) believed that CA can reduce the impact of climate change, 15% did not have sufficient knowledge only 2% did not agree.

Women play an important role in reducing the effects of climate change: Majority of the interviewed q (80%) farmers believed women have key role in climate change action; 14% however did not agree while 5% were not sure.

In this community, people with disabilities are normally given equal access to livelihoods opportunities: Most farmers interviewed (78%) agreed that people with disabilities were given access to livelihood opportunities while 14% were not sure and only 7% didn't agree.

In this community, youths are normally given equal access to livelihoods opportunities: Majority of the respondents (92%) agreed that youths were given access to livelihoods opportunities, 15% disagreed while 6% were not sure. Researchers met youths working in gardens and field with parents. One interviewed young lady from Mutasa Ward 11, said she did want to be a farmer but she was doing it because she wanted money to pursue her dream career.

Animal manure and synthetic fertilizers had side effects on the environment and should be used sparingly: Most of the interviewed farmers (63%) were aware while a quart of the respondents disagreed and 11% were not certain.

I am satisfied with the training and support provided by EMA and Agritex: Above half of the respondents (60%) were happy with extension services from Agritex and EMA while a significant 38% were not and 3% disagreed.

Farmers' clubs are good in that, they allow farmers to work together, share knowledge and resources to increase agricultural production: All the respondents agreed that farmers clubs were beneficial.

Use of chemical pesticides causes harm to the ecosystem and must be practiced minimally: Most of the respondents (78%) believed in minimal use of pesticides, only 4% disagreed while 16% did not have sufficient knowledge.

Intercropping is good because it is a drought mitigation strategy: Most of the interviewed farmers (95%) believed in intercropping, 4% were not sure while only 1% disagreed.

Summary of farmers' perceptions on Agriculture Risk and Disaster Risk Reduction

CC knowledge was above average among interviewed farmers as some did not have sufficient knowledge of its reality, causes and effects.
Famers felt that vulnerable members of the communities were involved in resilience building projects.

Most of the farmers were aware that CA reduces the impact of climate change.

Most of the farmers were aware of the side effects of fertilizers and agriculture chemicals on the environment and the need for minimal usage while a small number was not aware.

Farmers were all in agreement that FCs had benefits to farmers which included pooling resources together.

Most interviewed farmers were aware that intercropping was helpful in mitigating against climate change impacts.

Evaluation of the DAPP-UNEP Project

Relevance

1. *Small grain crops are preferable in low rainfall areas:* Majority of the interviewed farmers (75%) had knowledge of the utility of small grains to mitigate droughts while 7% did not have the knowledge and another 7% were not sure.

2. *As farmers we joined the DAPP-UNEP farmers' clubs voluntarily*: Almost all the respondents agreed that they chose to join the project on their own, 3% were not sure.

3. *In the DAPP-UNEP project, people with disabilities were normally involved:* Majority of the interviewed farmers (77%) agreed that people with disabilities benefited from the project, 12% were not sure.

4. *In the DAPP-UNEP project, youths were normally given equal access to livelihoods opportunities:* Majority of the respondents agreed that youths benefited from the project, 4% did not agree while another 4% were not sure. Only 1% disagreed.

5. *In the DAPP-UNEP project, women were given more access to livelihoods opportunities:* Most of the respondents agreed that women benefited from the project, 35 were not sure while only 1% disagreed.

6. *The DAPP-UNEP project met our farming skills needs:* Most of the respondents (92%) confirmed that the project met their farming training needs; 8% were not sure.

7. *I am satisfied with the training and support provided by DAPP-UNEP project:* Almost all the farmers (98%) were satisfied by the support they received from DAPP.

8. *DAPP-UNEP farmers' clubs helped us as farmers to work together, share knowledge and resources to increase agric production:* Almost all respondents (98%) agreed that FCs helped them achieve goal as farmers.

9. *In the DAPP-UNEP project our complaints were listened to and addressed by DAPP project staff:* Most of the farmers interviewed (93%) confirmed that DAPP listened to their concerns an addressed them. 7% were not affirmative.

Effectiveness

10. *DAPP-UNEP project staff always provided stakeholders with accurate information on the project:* Most of the respondents agreed that project staff provided accurate information while 16% were not sure.

11. *DAPP organised regular community stakeholder meetings*: Most of the farmers interviewed agreed that DAPP organised regular stakeholder meetings, while 19% were not affirmative.

Efficiency

12. *In this project worked well with government extension officers and other local stakeholders for the benefit of the farmers:* Most of the respondents agreed that DAPP worked closely with GoZ extension staff, the remainder 13% were not sure.

13. *DAPP-UNEP project used resources well for the benefit of farmers:* Most of the farmers ((92%) believed that DAPP utilised resources for their benefit as farmers, 7% were not sure.

Sustainability

14. *DAPP-UNEP project was able to mobilize local resources:* Most of the respondents agreed that DAPP was able to mobilise local resources to enhance project results. 8% were not affirmative.

15. *DAPP-UNEP project has prepared us as farmers that we can continue without external help*: Most of the farmers Interviewed (93%) were confident to continue without external assistance. The remainder were not sure.

16. *DAPP-UNEP project lessons must be taught to farmers elsewhere:* Almost all the farmers (98%) agreed that DAPP lessons must be popularised in other places.

Impact

17. *As farmers will be able to maintain equipment and facilities built by the project on our own:* Most of the farmers (97%) were confident of their skills to maintain equipment supplied by DAPP without help, 4% were not sure.

18. *Our farmers' clubs will continue beyond DAPP-UNEP support:* Most of the respondents (95%) thought their skills will be sustained without external support.

19. *As farmer we are better off after the DAPP-UNEP project:* Most of the farmers (95%) felt the project left them better off.

20. *DAPP-UNEP project supported farmers who would not get support from other programmes:* Majority of the interviewed farmers (78%) agreed that the project assisted farmers who were left out by other project. 15% were not affirmative while 6% disagreed.

OUTPUT D: PROJECT LESSONS PROJECT GOALS, LESSONS LEARNED, RESULTS DISSEMINATED WIDELY.

The theory of change for the project entailed providing skills to farmers and stakeholders; practical application of the skills and sharing the knowledge and results from application. Information was passed to farmer though lessons, demonstrations plots and gardens. According to KII with project staff and stakeholder monthly reports of activities were generated, and shared with DAPP head office, some district stakeholders (RDCs and DAs). DAPP head office shared project reports with UNEP. Community information, gathering and dissemination sessions and stakeholder conferences were held in each of the two districts every year.

Community conferences were confirmed by district stakeholders. However KIIs with some relevant district stakeholders indicated that engagement was not very effective to such an extent that some key officers were not aware that the project was being implemented, particularly in Gutu District.

According to some of the reports reviewed by the evaluators, projects lessons were documented and results were shared through various media platforms including publications in local and international newspapers and plat forms which include: Manica Post, The Herald, DAPP Zimbabwe Website, Humana Website[23] etc. The End of project report has been generated, shared with the consultants and was reviewed during this evaluation.

Some of the issues which co sharing of project lessons.

Some of the GoZ officers where reports were submitted did not read the project report submitted like the RDC CEO for Gutu. The DA was still new but she was well versed, her schedule was too busy for her to make regular visits. District Nutrition Department, District Social Welfare Officer EMA officers reported that they had no knowledge of the DAPP project under review. District Agritex Office which core chairs the Food and Nutrition Security Committee did not get written project reports from DAPP.

However, in Mutasa District Officers were better informed about the project save for the RDC Officers who had vague memories. The only knowledge the RDC has was through student attachés who had attended the community stakeholder conferences on behalf of the RDC.

Project awareness raising among local government leader RDCs and ministry departments at district level need to be enhanced in order for them to appreciate its contribution and influence local policies.

[23] DAPP Final UNEP Report December 2018, page 21

INDICATOR TABLE

Table 48: Indicator Table

Objectives & Results	Baseline	Target	Achieved
Specific objective			
5. % of small holders farmers adopting agro-ecology farming practices – to include applying organic fertilizer to their crops, number of farmers having compost in their fields, and farmers involved in crop rotation - and eating healthy foods – including organic produced vegetables, fruits, and pulses such as sugar beans and peas.	25%	50%	80%[24]
6. % of small holder farmers engaged in vulnerability reduction and climate risk management activities	20%	50%	35%[25]
7. # of farmers' clubs established and active	0	8	8[26]
8. % reduction in greenhouse gas emission	-4,633 tCO2eq	5,455 tCO2eq.	7.3 tCO2eq[27]
Result A			
5. # of improved climate smart techniques covering production, water conservation and soil protection adopted by 50% of the farmers measured by climate smart farming techniques' adoption.	5	6	6[28]

[24] Indicator: $\frac{1}{n}\sum_{i=1}^{n} a_i = \frac{1}{n}(a_1 + a_2 \ldots + a_n)$ where, a_1 = Farmers that use organic fertilizer (53%), a_2 = Farmers with Composts in the fields (50%), a_3= Crop Rotation (67%), a_4=Vegetables and Fruits (67.5), a_5=Pulses (23%)= 52%. While there was wide adoption of agro-ecological farming practices 80% (DAPP Final Project Report), most of the farmers had limited resources for implementing the adopted practises (52%)

[25] CSA Techniques Practiced ((Ctrl Click to view table); Average of CA Techniques applied

[26] DAPP Final Project Report

[27] Source: DAPP Carbon Report: Data used for calculation was not sufficient, in our view, to determine credible estimations for the project as required by IPCC standards for NDCs. However, DAPP must be commended for taking the initiative in the absence of comprehensive national guidelines on GHG estimations.

[28] All Farmers acknowledged having received training and adopted the various Climate Smart Agricultural techniques. However, implementation, particularly Gutu District, was very limited. CSA Techniques practiced (Ctrl Click to view table); in terms of regular application only two of the CA techniques were practised by more than 50% of the farmers.

Objectives & Results	Baseline	Target	Achieved
6. % average yield increase for cereal production.	634kg/yr	710kg/yr	874kg/yr
7. % average yield increase for horticulture production.	206kg/yr	240kg/yr	440kg[29]
8. # hours of training completed by 2,000 farmers. Baseline : 48 hours, target: 982 hours	48hrs	982hrs	982 hours
Result B			
5. % average increase on family income from cereal sales for the 2000 targeted farmers. Baseline $66, target 10% or $72.60	$66	$72.60	$71[30]
6. % average increase on family income from horticultural sales for the 2,000 targeted farmers. Baseline $32.50, target 20% or $39	$32.50	$39	$81[31]
7. % average increase for family income from agro-processing for 2,000 targeted farmers.	$40	$48	Data available insignificant to make a calculation
8. % average increase for family savings for 2,000 targeted farmers. Baseline $175, target 10% or $192.5	$175	$192.5	25%[32]
Result C			
3. % of target households consume at least an average of 3 meals per day containing at least 5 of the 8 food categories derived from FAO Food Consumption Table for Africa. Baseline 56%, target 60%	56%	60%	85.4%[33]
4. Safe hygiene practices adopted by % of targeted 2,000 households. Baseline , target	23%	35%	21[34]%

[29] DAPP Field and Garden Crop Database
[30] Average yield sold * average price) – 196kg*0.36(average price of cereals)
[31] Average Yield sold * Average Price sold = (34% of 440) 149.6kg*0.54=81
[32] (HH Average Income - HH Average Expenditure) = $4 - $3: Savings =$1/day or 25% of income
[33] Dietary Diversity Scores (Ctrl Click) Count of Foods over 50% Consumed for 3 plus days
[34]

Objectives & Results	Baseline	Target	Achieved
Result D			
4. # attendees at 3 conferences held for community members and stakeholders (Goal: 120)	0	120	127[35]
5. # project end of term reports created (Goal: 1)	1	1	1
6. # copies of project report distributed to key national & international stakeholders (Goal: 80)	0	80	80[36]

[35] DAPP's Final Project Report
[36] Source DAPP's Final Project Report

Conclusions

The project successfully mainstream gender and reached more women than men had approximate direct beneficiaries of 12 000.

Output A: The project was demand led and resourced in line with GoZ approaches. CSA was widely adopted by target farmers but implementation was on part of the production land. Lack of draught power and rugged terrain in Mutasa, encouraged farmers to embrace CSA.

Output B: Major constrains still remained in inputs for farmers to escape the poverty trap as most farmers did not produce enough to sell. The realized income from agriculture production was insignificant and many still found it hard to purchase quality inputs which affected their yields.

Output C: Target farmers managed to improve their dietary diversity through crop, horticultural production and achieved hh food and nutrition security production. Dietary diversity was improved for target households. Their general health was improved in all wards.

Output D: Project Lessons Project goals, lessons learned, results were disseminated widely. However, some of the District stakeholders in both districts were not well sensitized in the project goals. This was most reported in Gutu. Rural farmers widely embraced the farmer education approach and felt it was empowering though a number of farmers still needed capacity to fully implement CA and realize it benefits as promoted under the project.

The relevancy of the Ex-Act Tool for the project: The Ex Act tool is suitable for project level GHG data collection and estimations though in Zimbabwe it was new, very few GoZ officers in the Climate Change Department were familiar with it, and those who knew it had not practically applied it. At the time of the evaluation, Zimbabwe was still defining its methodology on GHGs Inventory.

Overal the project design and theory of change: The project design was very relevant and well aligned with GoZ's national SDG goals as well as rural farmers' needs. The project period was rather too short to have achieved some of the intention outcomes like full adoption of CA where GoZ works with periods of 3 to 4 years; agroforestry and forestry carbon sinks need more time for trees to grow. Some of the target farmers had started growing trees as result of the education received, but they still faced challenges with some of the introduced varieties and needed support over time. The carbon calculation was a good initiative by DAPP, but at the time the project started GoZ still had not fully determined national guidelines line with IPCC guidelines for NDC GHGs inventories as such some of the aspects that require national determination of GHG emission estimates were not defined. Field data collected at project level on GHG must be guided by national parameters. GoZ and its technical team on GHGs received capacity building on GHGs Inventory for NC4 from IPCC in January 2019 which will lead to recalculations of its earlier estimations. The Ex Act tool will become very handy if project staff are fully capacitated in its use and collect quality data at project level to feed into the national inventory.

Summary of Farmers' Evaluation and Recommendations

Evaluation Category	Assessment	Recommendations
Relevance: - extent to which the objectives of project were consistent with the beneficiaries' needs and requirements, Zimbabwe Government's Agriculture Sector Goals, UNEP global priorities and partners' priorities, project stakeholders, etc.	Promotion of small grains was suitable for climate requirements of the target communities.	DAPP to consider scaling up the Project and lessons learnt to be promoted widely to other needy farmers.
	Farmers voluntarily joined the FCs clubs due to the felt relevance of the project theory change.	Include solar powered small irrigation schemes in the project intervention.
	Farmers confirmed that the project did well on social inclusion of vulnerable social groups. Farmers felt the project met their farming skills needs and were satisfied with the farming skills provided.	There is need to further capacitate farmers with accountability systems as there existed some unresolved issues with regards to use of FC resources by FC leaders.
	FC clubs allowed farmers to pool resources together and enhance their adaptive capacities climate change.	
	Project had accountability mechanisms that provided mechanisms for feedback and remedy for complaints,	Strengthen accountability and transparency mechanism to reduce conflict.
Effectiveness: Assessing Degree to which project outcomes have been achieved as a result of project activities including unexpected outcomes.	Farmers felt the DAPP staff always provided them with accurate information on the project and regular community stakeholder meetings were held. Farmers felt that the project achieved most of its objectives as promised at inception.	Continue with the new approach which is demand driven and resourced as it empowers farmers to take responsibility and ownership of their development as opposed to traditional donor dependency.
	Most of the project results were achieved using mostly local resources.	There was a general call for DAPP to expand the project to other wards in the same district

Efficiency (sound management and value for money):-	The project was managed well in line with DAPP administration policies for finance and procurement. Quality inputs were purchased were procured from reputable suppliers.	Model fields to increase ideally, each Rural wards were too wide spatially, each FC should have had its own demonstration plot to reduce the travelling burden on women as well as loss of productive time.
	The project worked well with local stakeholders at community level who included traditional, political and community leaders for the benefit of farmers.	Provide adequate resources at FC level.
	Ripper tines supplied were too few for the 2000 farmers as some would not have access or would lose on timing while waiting to use them	
Sustainability of results (likely continuation of achieved results	The project was able mobilize to mobilize local resources to enhance project result like inputs form seed houses and land from traditional leaders and farmers.	Community structures set under the project still needed DAPP to continue with technical support to beneficially farmers.
	Farmers felt that the project prepared them enough to continue without external assistance. They also felt the project lessons should be taught widely to other needy farmers.	There was need to improve drafted FC constitutions as well compliance with the same to enhance mutual accountability and reduce conflicts. DAPP should consider group maturity index (GMI) tools for developing these community structures.
	There was improved social organization of farmers with the structures set under the project. FC committees had constitutions.	
Project Impact Assessment (achievement of wider effects):	Farmers reported that they would be able to maintain equipment supplied by the project on their own. Most farmers felt the acquired skills will be sustained without external support.	The decline in the area under CA, shown a natural trend in the impact of rural projects. Rural farmers need sustained capacity building in CA for minimum of 3 years in line with GoZ strategies.
	The project supported	Target local leaders with project goals

	farmers who were mostly left out of other development projects. The FCs club were able to equip the whole family as any capable family member was free to participate in the activities.	and lessons to influence policy change.

Recommendations

- DAPP to consider scaling up the Project and lessons learnt to be promoted widely to other needy farmers. The project period was rather too short to have sustainably transformed traditional farming practices.
- Project design should include installation of solar-powered small irrigation schemes in the project intervention to avoid disruptions of practical demonstration as a result of water shortages.

- There is need to further capacitate farmers in record-keeping at hh level for resource effiency and accountability systems at FC levels to reduce conflicts issues with regards to use of FC resources by FC leaders.

- Strengthen accountability and transparency mechanism to reduce conflict among farmers.
- DAPP should continue with the new approach which is demand driven and resourced as it empowers farmers to take responsibility and ownership of their development as opposed to traditional donor dependency.

- There was a general call for DAPP to expand the project to other wards in the same district
- Demonstration fields to increase ideally, each FC should have its own demonstration field or garden to reduce the burden of travel and loss of productive time on women and the elderly.

- Provide adequate resources at FC level in order fully demonstrate CA.
- Community structures set under the project still needed DAPP to continue with technical backstopping as Agritex is still underfunded.

- There was need to improve drafted FC constitutions as well compliance with the same to enhance mutual accountability and reduce conflicts.

- DAPP should consider group maturity index (GMI) tools for developing these community structures.

- The decline in the area under CA, shown a natural trend in the impact of rural projects.

Rural farmers need sustained capacity building in CA for minimum of 3 years in line with GoZ strategies.
Target local leaders with project goals and lessons to influence policy change

- Specifically targeting local, government, traditional and religious leadership with climate change awareness raising as recommended at endline need to be need to be factored-in when implementing similar future projects for sustainability of outcomes and impacts.

- In future the such opportunities, as the one in Mutasa of penned livestock due to land shortages of pastures must be fully capitalized for managing GHG emissions

- Kukwanisa Model Farm is a strategic community asset which needs improved management for the community to realize its full benefits of diversified skills for livelihoods projects. Some farmers in Gutu Ward 8 who knew the model farm recommended that DAPP would establish a similar model in their ward. The Chief and Counsellor were prepared to provide the land for the same.

- DAPP should consider further capacity building on climate change and the use of FAO's Carbon Ex-Act Tool to enhance quality data collection which can feed into the national GHG inventory.

ANNEXURES

Table 49: Annexures

Annex No	Document (Double Click to open)
01	TERMS OF REFERENCE FOR EN
02	Perceptions.docx
03	Evaluation.docx
04	DAPP HH TOOL-ENDLINE DAR
05	KII -Government Stakeholders.docx
06	KII - Project Staff.docx
07	Video Link https://goo.gl/JKZc2Q
08	Data Sets DAPP_Project_Evaluation - all versions -