

MUSHANDIKE ORGANIC FARMING PROJECT PRELIMINARY STUDY REPORT

*A comprehensive report on the preliminary research on organic farming in the
Mushandike area conducted by The Advivia Zimbabwe Community Development
Trust*

Executive Summary

This report documents the findings of the preliminary study on organic farming in Masvingo Province's Mushandike area which was conducted in March 2022 in order to guideline Advivia's proposed organic farming project in the Mushandike area. The preliminary study aimed to achieve a greater understanding on the farming activities, structures and conditions in the Mushandike area including all the factors affecting the farmers in the area in order to identify the risks and the opportunities which are likely to affect the intended project of organic farming. The study will also assist in mapping our next steps in the conducting of the proposed project; hence it was a critical step for planning purposes as well.

Introduction

The adoption of advanced farming techniques across the globe has resulted in significant increases in yields and played a very huge and transformative role in addressing food shortages. However, this has also resulted in a fair share of challenges which have apparently become more threatening to the human population as the destruction of ecosystems have reduced yields with the environment no longer able to sustain the capacity it used to produce and chemical compositions of the genetically modified organisms (GMOs) has become a health concern thus prompting the need for alternative solutions in ensuring sustainability in the agricultural sector, which is a backbone of every society across the world.

Food production is one of the key economic drivers in Zimbabwe and plays a very critical role in the livelihoods especially in the rural communities like Mushandike. The adversities of the economic hardships, coupled with those of the modern day farming practices have proved to be a prevailing challenge in most rural communities in Zimbabwe including Mushandike. The organic farming program initiative therefore seeks to provide a sustainable and holistic approach to farming in the rural communities of Zimbabwe as a way of improving the rural livelihoods through creating linkages between the farmers who shall be carrying out organic farming in Mushandike and the surrounding markets in Masvingo. This program will also ensure income circulation in the communities whilst also promoting good health to the vulnerable members of the society through encouraging them to grow and consume healthy

foods. The Advivia Zimbabwe Community Trust already has a number of projects underway in the Chidzikwe and Mushandike areas of Masvingo Province in Zimbabwe; we decided to take the organic farming venture as a way of continuing with our aim of transforming livelihoods through providing opportunities for the vulnerable in reaching their capacity for self-sustainability.

Background

Mushandike is located in the Masvingo District of Masvingo Province about 30kilometres from Masvingo City via Beitbridge road. Mushandike Dam was constructed in 1939 by the then Rhodesian government but was later established as a small-holder irrigation scheme by the Zimbabwean by the Zimbabwean government in the mid-1980s (Zvokuomba & Batisai, 2022). Mushandike is also located in the agro-ecological region IV and V meaning the area is characterized by low annual rainfall and high average temperatures. The area is also characterized by very limited grazing areas which makes it a limited place for cattle ranching. The area is also divided into dry land area, where farming practices are only carried out during the rainy season and the irrigation area, where the areas have access to irrigation canals. According to (Zvokuomba & Batisai, 2022), the area has been frequently faced with water challenges due to poor rainfall distribution, poor water management practices and poor water retaining infrastructure resulting in farming challenges due to lack of water. (Zvokuomba & Batisai, 2022), Also noted that the area has low access to grazing and is prone to livestock related diseases.

Research Approach

The study adopted a combined approach in order to obtain both qualitative and quantitative data from the field of study. The research therefore used structured and semi-structured interviews, focus group discussions and questionnaires for the smallholder farmers. Some of the data was also retrieved from available literature as we tried to ensure the highest credibility of the information generated by the study. The research adopted an exploratory design based on obtaining information directly from the sources whilst also making assessments on the ground in order to qualify the information obtained as well as to get more details on data which may easily be omitted by the informants. The interviews and

focus group discussions were held on ground and the Advivia team had a direct interaction with the informants and all the participants.

Population and Sampling

A field visit was conducted with 14 local farmers from ward 9 and 10, the councillor, the village head, the headman and the AGRITEX extension officer in Mushandike. Key informants such as the Masvingo District Development Coordinator and two council officials from Masvingo Rural District Council were also part of the study. Whilst the farmers were the primary target for the research, other mentioned participants played a crucial role in providing us with more detailed information of the area as they are either officials or local leaders with much broader knowledge, not only of the area but in farming as well as the AGRITEX extension officer is an expert farmers trainer and an agricultural consultant assigned to every ward in Zimbabwe to assist the farmers and the local communities with improved farming techniques.

Gender Profile

Below is the gender profile of the 20 participants involved:

Sex	Number of participants
Male	13
Female	7

This profile however, only consisted of the interviewed participants and may not be officially used as the correct reference of the gender profile in the area. Due to limited availability to data, we were unable to retrieve official data on the gender profile for the Mushandike area for use on our research.

Age Profile

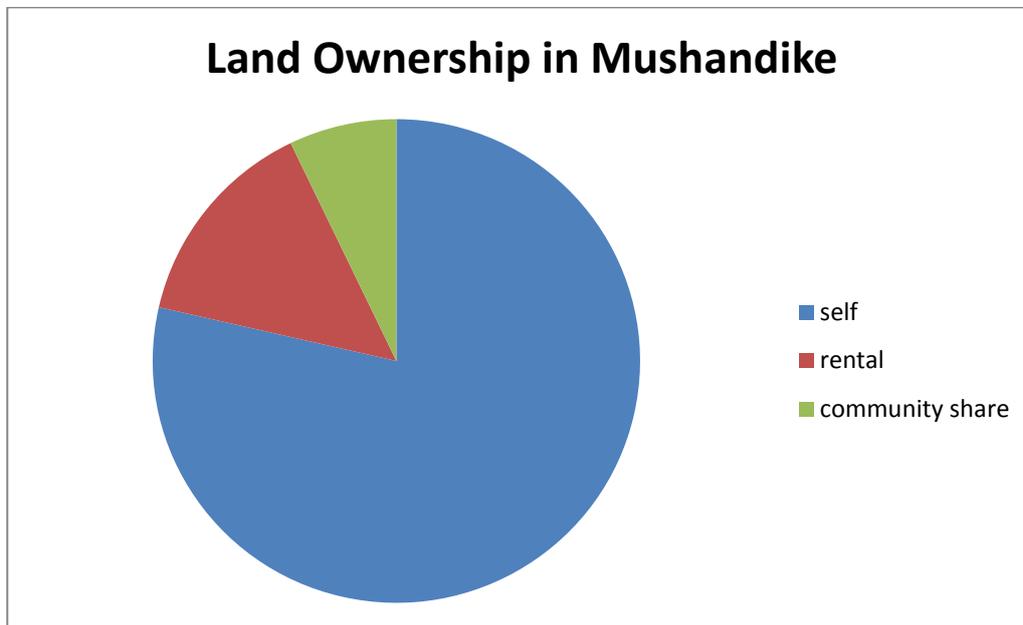
Below is the average ages of the participants involved

Age group	Number of participants
Youth (18yrs – 34yrs)	3
Adults (35yrs – 64yrs)	10

Data Presentation and analysis

Ownership and average plot size

Farmers indicated that their plots were below 5 hectares with the AGRITEX extension officer indicating that all plots were of equal size at 1.5 hectares per plot. Basing on our study, ownership of the land is mainly dominated by self-ownership even though community share and renting of land was also identified as presented below:

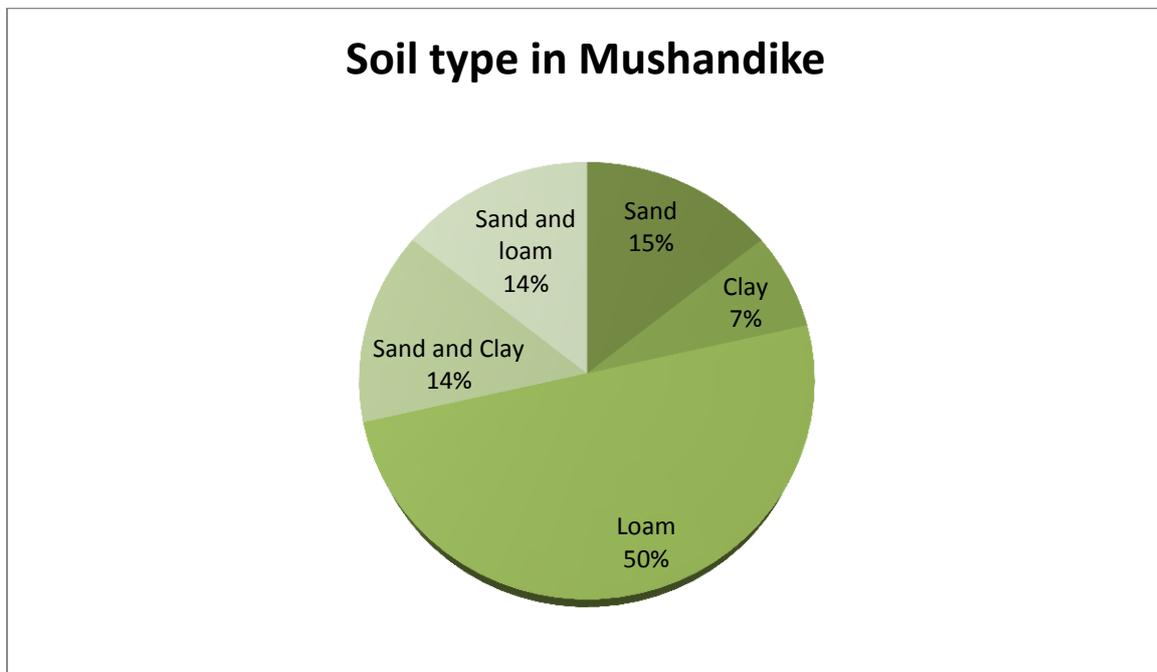


The study showed that men dominated land ownership with female landowners being widows whose land has been left to them by their late husbands, it was also noted that the youth were renting land and did not actually own land except in cases where land was passed on to them from their families. One of the youths who was our interviewee highlighted that *“Minda tinotobhadhara pamwedzi wega wega kuti tirime, tikarega hapana yekutamba”* Meaning “We pay monthly rentals for the plots so that we can grow crops, if we don’t we will not have any other income earning activity”. During the interviews, one elderly lady also said *“Ini ndakasiirwa munda wangu nemurume paakashaya, sezvamunongoziva mutsika dzedu kuti vana baba ndivo varidzi vemusha nemuno maMushandike ndizvo zvazvingori”* “My husband left me ownership of the plot when he passed away, as you are aware in our culture,

men are the head of the families and they are the owners of the land, even here in Mushandike that's how it goes" This suggests that land ownership is primarily dominated by men but that's strictly on a cultural basis which considers males as the heads of the family and that the youth have limited access to land as a means of production, thus they are forced to find other income earning activities which explains their poor involvement in farming as evidenced by their poor representation as participants to this study.

Soil structure and profile

Of the interviewed farmers in the Mushandike area, all were able to identify the soil type on their plots. The study inquired the soil type on the plots of the farmers in Mushandike, out of the total of 14 farmers interviewed and, the following information was obtained:



From the findings of the study presented, the plots in Mushandike are dominated by loam soil (50%) with sand (15%) and clay (7%) being the other primary soil type in the area. The area also has a mixture of sand and clay (14%) as well as sand and loam (14%). Loam soils are of average permeability and average drainage whist clay soils have a relatively poorer permeability with sand soils being highly permeable and of high drainage as well. The primary observation from this study is that the soil types in Mushandike are of average quality. However, there is need to carry out a more detailed soil analysis on plot level in order to determine the soil structure and quality in order to make the necessary recommendations.

Source of water

The survey also sought to explore the main sources of water used for farming activities in Mushandike and also to investigate the type of infrastructure being used in water management by the smallholder farmers in the Mushandike area. The study noted that there were two separate groups in Mushandike with one group of smallholder farmers having access to irrigation water as they are physically located in the irrigation area as well as farmers physically located outside the irrigation area. Thus the area is divided into irrigation and dry land agricultural areas. The study found out the information below:

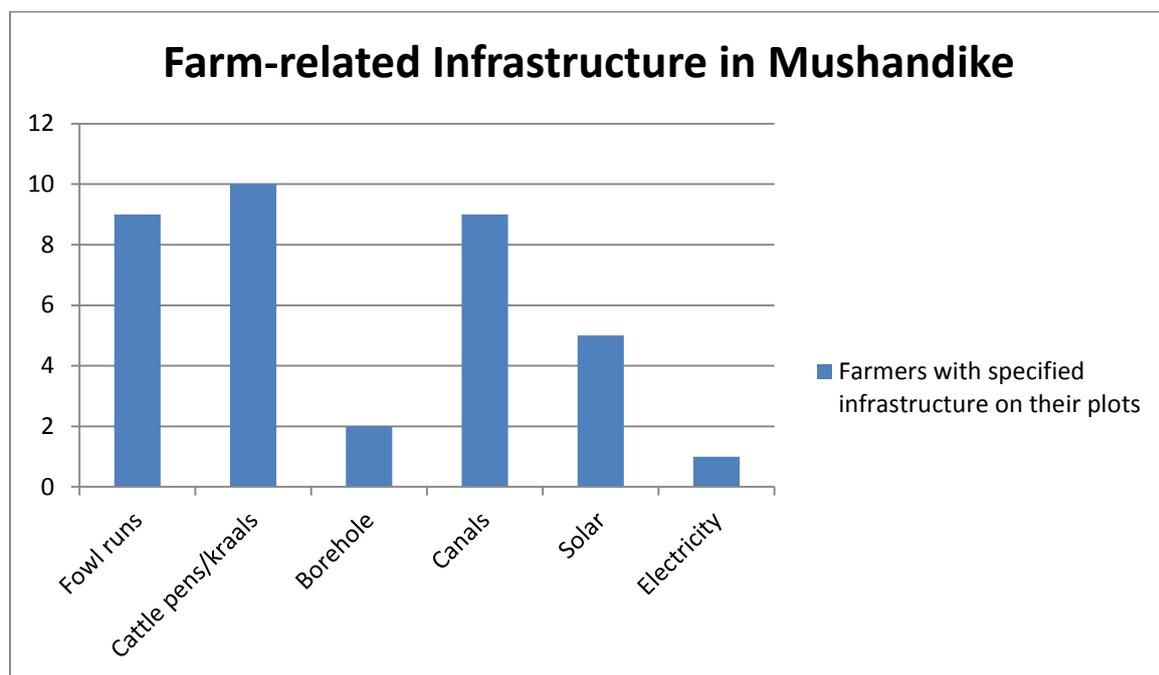
Water source/ harvesting infrastructure	Number of interviewed farmers
Mushandike Dam / Irrigation canals	9
Rain	5
Well	0
River	0
Reservoir/tank	0
Borehole	2

The preliminary study noted that all of the farmers in the dry land area relied only on rainfall and had no other source of water or related infrastructure for water harvesting to be used for farming activities. Similarly, all of the farmers in the irrigation area relied only on irrigation canals as their main source of water for farming purposes with only two farmers having boreholes as backup. During the interviews with the farmers, we observed that the current rainy season had already affected most of the farmers who rely only on rain especially in the dry land as they were expecting lower yields due to the dry spells experienced in the area. *“Zvinhu zvakatsva, hatina kana tarisiro yekuti pane chinobuda. Mvura haina kunaya zvakanaka”* “the crops have wilted, we have no hope for a good harvest. The rains were poor and it affected our crops” were the remarks of one of the farmers from the dry land area. Even some of the farmers in the irrigation area were also affected as one farmer also highlighted that *“mari irikudiwa kutenga mvura yekudiridza yakawanda, tange tichitarisira kuti denga richatibatsirawo asi zvaramba”* “The irrigation water fee is high, we were hoping the sky would aid us but we are unfortunate”. From the information presented above, water

supply is a serious challenge to farming activities in Mushandike as the area receives very low amounts of rainfall which are poorly distributed and erratic during the rainy season. The state of irrigation infrastructure is also in a poor condition as witnessed by some broken or blocked canals witnessed during the area assessment by the Advivia team.

Farm Infrastructure

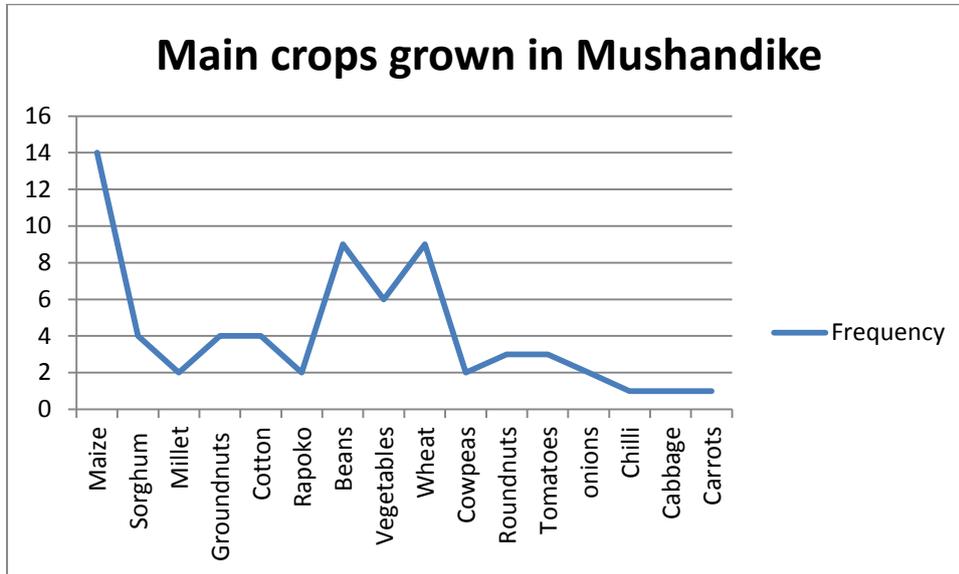
We asked the participants to highlight the infrastructure they had available on our questionnaire and the following data was retrieved:



64% of the interviewed farmers indicated that irrigation canals run through their plots and the canals are the main source of water used for agricultural purposes whilst 36% of the farmers are in the dry land area and only 14% of the interviewed farmers had boreholes, this figure is however not a true depiction of the number of boreholes in the area as the AGRITEX extension officers cited during the interview that water availability is a challenge with very few boreholes in the area, too much reliance is placed on the Mushandike Dam which supplies irrigation water but is also stressed due to climatic conditions and overuse. 36% of the respondents have access to electricity supplied by the national grid by the Zimbabwe Electricity Transmission and Distribution Company (ZETDC) whilst 7% of the respondents use solar power. Interviews also indicated that the farmers have no storage facilities for perishable products and they have to rely on marketing their products quickly before they

get bad, farmers also reviewed that they access transport through hiring and hiking to get access to external markets.

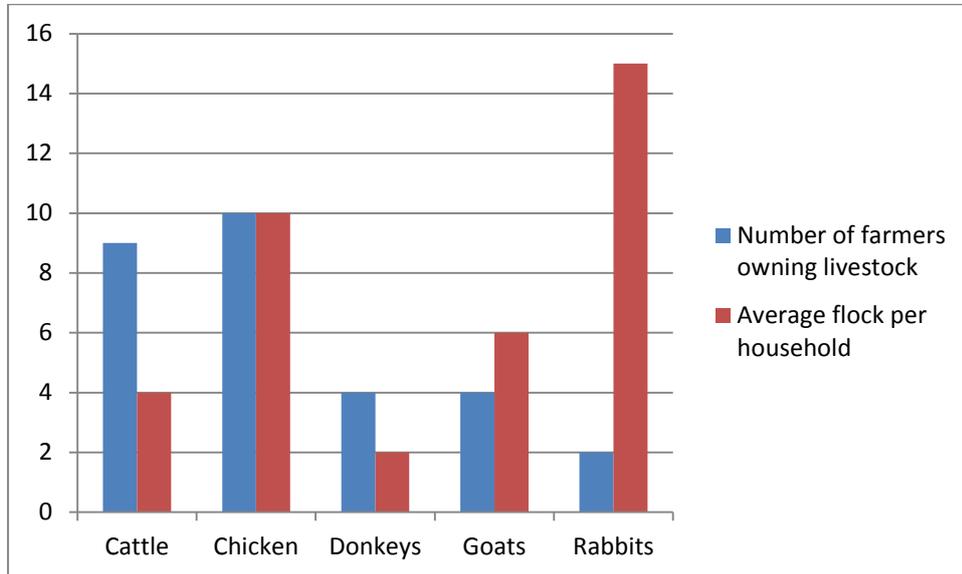
Main crops



The graphic above shows the main crops produced by farmers in Mushandike, the survey asked the farmers to highlight the main crops they grow and the graph above indicates the total number of farmers who listed the indicated crop out of the total of 14 respondents. Maize dominates the majority of the crops produced in Mushandike, whilst beans and wheat is also grown by a large number of farmers. Small grain varieties such as millet, rapoko and sorghum are also grown even though at a smaller scale than maize, beans and wheat. Vegetable varieties are also popular in the areas with most farmers indicating that they grow a different variety of vegetables on their plots. The farmers in Mushandike indicated that different factors come into play when selecting the type of crop to produce. The main reason for crop production is for consumption and the surplus is for sale, which explains why maize dominated the list. However, some crops such as cotton, wheat, beans and sorghum are also grown more for commercial purposes even though the surplus is kept for consumption for some of the products like beans. The farmers also cited seasonality as a deciding factor in crop production, during the rainy season the farmers grow maize, cotton, beans and other small grains and during winter they produce wheat whilst vegetables are mainly grown in summer. Due to the lack of water, the scale of production during the dry season is limited

hence most farmers reduce their scale of production or are not producing at all. Overall, there is quite a dynamic range of crops which are produced in the area.

Livestock and poultry



Livestock keeping and poultry is common in Mushandike, of the total sample, 86% of the interviewees showed that they were either keeping livestock or poultry. The most common animal kept in Mushandike is cattle with a number of farmers also owning donkeys and goats, whilst indigenous chicken breeds dominate poultry. Some of the farmers are getting into rabbit keeping as well and the two respondents who indicated keeping rabbits, highlighted that it is a startup project still in its infancy. Most farmers in Mushandike keep relatively small amounts of livestock and this is mainly due to the limitations of space, which is not favorable for large herds. Most farmers also indicated during interviews that there was a drastic reduction in the average herd size of cattle per household owing to a ravaging cattle disease called Theileriosis (January disease), a disease affecting cattle that is transmitted by ticks which resulted in a significant reduction in the number of cattle per farm with some farmers losing all of their cattle.

Organic Farming

The survey sought to see whether the farmers in Mushandike had prior knowledge to the concept of organic farming, 64% of the interviewees showed prior knowledge on organic farming whilst 36% showed that they were hearing about organic farming for the first time.

However, an in-depth analysis showed that most farmers employ traditional methods of farming, including certain organic farming practices. Organic farming practices currently being employed include the use of manure from livestock and poultry as well as organic matter and crop residue composts for fertilizers. Mulching, crop rotation and intercropping is also practiced in Mushandike. However, the farmers have limited knowledge and limited resources to fully engage into organic farming. Some of the challenges noted during the study included farmers expecting high returns prompting farmers to use chemicals as they guarantee higher returns. Farmers also had limited knowledge on advanced organic farming practices as well as resources limitation.

Common pests and diseases

Farmers in Mushandike grow a dynamic range of crops and keep a dynamic range of livestock and poultry. As such, there is also a wide range of pests and diseases which affect the area. Common pests include armyworm, aphids, ticks, quelea birds, maize stalk-borer, red-spider, mice, leafminers and cutworms. Common diseases include Theiliriosis, Coccidiosis and Newcastle, rust, mildew, blight and stem-rot. We noted that cattle were dying from a ravaging cattle disease known as Theiliriosis or January disease and from the investigations, the disease had become resistant to all known control methods.

Control

The farmers in Mushandike use pesticides and herbicides to control the plant pests and diseases as well as dosages, dipping and spraying for livestock. The farmers also indicated that they use indigenous herbs to control diseases such as Newcastle and Coccidiosis.

Income and expenditure

71% of the interviewed farmers indicated that they financed their farming activities with the income they earned from the farm output whilst 29% indicated that they had other sources of income. The farmers indicated that they mostly spend on buying inputs as well as on paying labor, some of the farmers also indicated that they use the same profits for other livelihood activities such as paying for school fees and buying groceries. This shows that the farmers in Mushandike rely heavily on the output for the support of their livelihoods, thus farming is the backbone of the socio-economic structure in the area.

Budget

There were a lot of variations on the budgets presented by the farmers in the area with most farmers highlighting that they spend mostly between US\$250-US\$350 per season. However a mock list below presents the most listed activities on the budgets presented the farmers and the average cost per limited item.

Activity	Cost (average/US\$)
Land Preparation	\$50
Seed (Maize)	\$45 per 25 kilograms
Seed (Cotton)	\$40 per 25 kilograms
Seed (Sorghum)	Retain seed
Seed (Groundnuts)	\$10 per 5 kilograms
Cowpeas	\$10 per 5 kilograms
Pesticides	\$20
Herbicides	\$50
Harvesting (Labor)	\$50
Compound D fertilizer	\$25 per 50 kilograms
Ammonium Nitrate Fertilizer	\$22 per 50 kilograms

Market Analysis

The farmers in Mushandike demonstrated lack of knowledge on market standards and requirements as they mostly trade informally amongst the members of the community and with the informal traders from Masvingo town. The farmers also showed that they had limited knowledge on demand and supply trends on their products, in a market study conducted by the ADVIVIA team, most of the informal traders in the Masvingo town vegetable market indicated that there is not enough supply of farm produce and they had to get produce from as far as Harare and Mutare, showing that there is a gap and a potential market available for the Mushandike farmers to supply. The market structure analysis indicated that 49% of the interviewed farmers had access to markets from outside

Mushandike and within Mushandike. 21% accessed markets outside Mushandike, 21% within the Mushandike community and 7% from Masvingo town.

Nutrition

Focus group discussions with the women in Mushandike revealed that there is limited access to food supplies in the area with some of the families starving due to poverty and poor climatic conditions discouraging the production of enough food in the area. The study also revealed that there is limited knowledge on nutrition by breastfeeding mothers with the breastfeeding mothers and infants lacking access to a balanced diet. The discussions also revealed that there is some resistance on the adoption of small grains as alternatives to maize.

Recommendations

1. The Mushandike community must adopt soil fertility management and improvement systems in order to preserve their farming activities including conducting soil tests and analysis
2. The Adoption of water management practices and water harvesting techniques in order to address water challenges dominating the area.
3. Encourage the participation of the youth and women in farming activities
4. More researches should be on crop and livestock managements in order to improve the quality of the output in production as the area is ridden by pests and diseases affecting both crops and livestock in the area.
5. The adoption of holistic approaches to pest and disease control in the area.
6. Training on sustainable agricultural practices such as organic farming
7. Training on planning activities from pre-season to post-harvest including budgets, crop selection, crop management, marketing and re-investment into the production cycle.
8. More awareness on market standards and requirements and creating more reliable market linkages, a fair pricing system and quality control.
9. Training on nutrition, malnutrition and balanced diet.