Local food plants for nutrition

IMPROVING DIETS AND REDUCING FOOD SCARCITY WITH THE HELP OF LOCAL FOOD PLANTS IN MASHONALAND CENTRAL, MASHONALAND EAST, MASVINGO, MATABELELAND NORTH PROVINCES IN ZIMBABWE

SD=HS Sowing Diversity = Harvesting Security

Community Technology Development Trust

OXFAM Novib

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Acronyms

ASOCUCH	Asociación de Organizaciones de los Cuchumatanes
CTDT	Community Technology Development Trust
CSI	Cognitive Salience Index
DSR	Dietary Species Richness
ESAFF	Eastern and Southern Africa Small Scale Farmers' Forum
FFS	Farmer Field School
FOVIDA	Fomento de la Vida
FVS	Food Variety Score
HDDS	Household Dietary Diversity Score
HFIAS	Household Food Insecurity Access Scale
HHS	Household Hunger Scale
Li Bird	Local Initiatives for Biodiversity, Research and Development
MAHFP	Months of Adequate Household Food Provisioning
MsHDDS	Micronutrient Sensitive Household Dietary Diversity Score
NAFRI	National Agricultural and Forestry Research Institute
NUS	Neglected and Underutilized Species
PELUM	Participatory Ecological Land Use Management
SD=HS	Sowing Diversity = Harvesting Security
ZAAB	Zambia Alliance for Agroecology and Biodiversity

Foreword

This document presents the main household-level findings of the baseline survey conducted between 2019-2021, during the second phase of the *Sowing Diversity = Harvesting Security (SD=HS)* programme (2019-2023). The results of the baseline are complemented with the main findings of the diagnostic exercises conducted by SD=HS' Farmer Field Schools (FFS). Both activities are part of SD=HS' work on Local Food Plants for Nutrition. SD=HS is a global program, and our work on local food plants is currently implemented by Oxfam Country Offices and partner organizations in seven countries. These partners are the *National Agricultural and Forestry Research Institute (NAFRI)* and the *Agricultural Research Center (ARC)* in Laos, the *Local Initiatives for Biodiversity, Research and Development* (Li Bird) in Nepal, the *Asociación de Organizaciones de los Cuchumatanes (ASOCUCH)* in Guatemala, the *Participatory Ecological Land Use Management (PELUM)* and the *Eastern and Southern Africa Small Scale Farmers' Forum (ESAFF)* in Uganda, the *Zambia Alliance for Agroecology and Biodiversity (ZAAB)* in Zambia, the *Community Technology Development Trust (CTDT)* in Zambia and Zimbabwe, and the *Fomento de la Vida (FOVIDA)* in Peru. SD=HS is coordinated by Oxfam Novib.

The use of the baseline data and FFS diagnosis conducted by farmers allowed us to establish the local and regional nutritional and agro-ecological conditions in the communities where the Farmer Field Schools (FFS) on Nutrition and Local Food Plants were implemented. The baseline data served to advise and guide the development of a country-specific FFS curriculum and the implementation of FFS activities, by informing FFS participants, collaborators, and other stakeholders about the potential role of local food plants in improving local diets and reducing the food scarcity period.

This Briefing Note is part of a series of briefing notes summarizing the program's findings on nutrition. The comparison of the baseline and FFS diagnosis results across the seven program countries will be consolidated in global SD=HS publications.

We are grateful for the funding support from the Swedish International Development Cooperation Agency (Sida).

We hope this document, which provides new and detailed data, contributes to increased attention on the role of local food plants for healthy and affordable diets, and improved nutrition of indigenous peoples and smallholder farmers.

1 Introduction

1.1 Malnutrition

Malnutrition remains one of the greatest global health challenges, and women and children are its most visible and vulnerable victims. People are malnourished when: (a) their diet does not provide adequate calories or nutrients for their body growth and normal function, (b) they are unable to fully utilize the food they eat due to illness, or (c) they take in too much energy, saturated or trans-fat, salt, and sugar (overnutrition). In all cases, malnutrition is closely linked to disease as it affects the function and recovery of every organ system. Poverty exacerbates the likelihood and effects of malnutrition. Furthermore, malnutrition contributes to higher healthcare expenses, decreased productivity, and hindered economic growth, fostering an ongoing cycle of poverty and ill-health[1].

In Zimbabwe, poverty plays a pivotal role in driving malnutrition. Impoverished individuals often struggle to access an adequate supply of food, clean water, and sanitation facilities, heightening the risk of malnutrition and related health issues. In 2019, approximately 6.6 million people in Zimbabwe were estimated to live in extreme poverty, an increase from 4.5 million in 2018[2].

As reported in the 2022 Zimbabwe Vulnerability Assessment (ZimVAC), there has been a rise in wasting (acute malnutrition) since the onset of the COVID-19 pandemic. Each year, approximately 15,000 children require treatment for severe wasting. Despite some improvements over the past decade, nearly one in four Zimbabwean children (about 23.5% or more than half a million) still experience stunting, which is caused by chronic malnutrition, hindering their full growth and development[3].

Several factors influence the nutritional status in Zimbabwe, particularly the poor quality of children's diets, limited access to safe water and basic sanitation services, and other challenges stemming from climate change and failing food imports. These factors affect household purchasing power and food choices, posing a substantial threat to the progress made in reducing stunting[3]. One of the primary drivers of malnutrition in the country is the lack of diversity in diets. Many Zimbabweans cannot afford to include a variety of foods in their daily meals, often relying on a limited number of staple foods like maize and beans. This dietary limitation can lead to deficiencies in crucial vitamins and minerals, with serious health implications.

In rural Zimbabwe, dietary patterns are largely determined by what farming families can grow, with white maize being a predominant staple. Unfortunately, white maize is high in starch and lacks sufficient nutritional value[4]. In terms of micronutrient deficiencies, nearly one in five children under the age of five in the country are deficient in vitamin A, a condition often referred to as hidden hunger. This deficiency is a consequence of a daily diet primarily composed of starchy staples.

1.2 Food scarcity

For many people, the availability of food is driven by seasonal cycles, and availability of food is least in the pre-harvest months. During food scarcity periods, household food stocks from the last harvest have dwindled. This may coincide with food shortages in the local market, meaning that food that is still available is sold at inflated prices. In this period of the year, the nutrition security of the family is most at stake. Rural households may be forced to resort to various coping strategies to deal with food scarcity, such as reducing the diversity and quantity of their meals, which has an effect on macro- and micronutrient deficiencies of household members.

Other strategies to which farmers resort when food scarcity really hits them, such as mortgaging or selling the land, livestock, and other household assets, may result in further spiralling into poverty. The challenges experienced during the scarcity period can be increasingly aggravated by the consequences of climate change. The psychological effects of food scarcity challenges are profound, and all family members may experience high levels of anxiety and stress during this period. Women are especially affected, as their responsibilities often comprise both food production, income-generating activities, and care for other household members (including food preparation). The effects of food scarcity periods tend to be overlooked by policy makers, or may only get attention when these result from natural or human-made calamities.

According to the Global Hunger Index (GHI), Zimbabwe falls into the 'serious' food insecurity category with a score of 28.8. Food insecurity in the country is a complex result of poverty, insufficient investment in agriculture, and the inflexibility of the food production sector, exacerbated by the adverse impacts of extreme weather events and climate change[5]. Droughts, which have exerted significant pressure on communal water resources, have been notably increasing in frequency and intensity over the past 30 years in the country[6].

In Zimbabwe, recent trends indicate growing food insecurity, and widening maize stock deficits[5]. To address the climate change-related challenges in agriculture, diversification toward local food plants capable of withstanding prolonged dry spells can improve nutrition security and should therefore be promoted. This approach serves both as an adaptation strategy to combat food shortages, improve nutrition, and enhance resilience[5].

1.3 Objectives

The objective of SD=HS work on Local Food Plants for Nutrition is twofold: 1. To enhance dietary diversitya and food security; 2. To reduce the duration and severity of climate-related food scarcity seasons. This is achieved through promoting the access to and consumption of diverse and nutritious local food plants while safeguarding local biodiversity and optimizing the management of these crucial plant resources. By achieving these goals, the initiative aims to improve overall nutrition security and resilience to climate challenges.

In order to improve the nutrition status of smallholder farmers and indigenous peoples, the following questions were addressed:

- What are, according to farmers, the local causes and consequences of malnutrition?
- What characterizes the food scarcity period and which strategies do farmers implement to cope with it?
- What is the role of local food plants in improving the diversity of the diet during the food scarcity and sufficiency periods?
- What is the role of the agroecosystems and local environments in the provision of local food plants?
- Are households that consume more local food plants less prone to suffer from food insecurity, food scarcity, and lower dietary diversity and quality?
- How can we best measure this? What are the implications of local food plant consumption for the most vulnerable households?

a Diverse diets include a variety of foods from different food groups, including cereals; white roots and tubers; vitamin A-rich vegetables and tubers; dark green leafy vegetables; other vegetables; vitamin A-rich fruits; other fruits; organ meat; flesh meat; eggs; fish and seafood; legumes, nuts and seeds; milk and milk products; oils and fats; sweets; spices, herbs, and beverages. A diverse diet is important to ensure the intake of a wide variety of nutrients, which is needed for a healthy life.

- What are the local food plants on which knowledge is shared by men and/or women in the communities?
- Which are the local food plants that are consumed during the food scarcity period?
- Who are the most powerful household members in terms of access to food?
- What are the roles of women and men in the acquisition of local food plants?
- Does gender affect the knowledge of local food plants?

This Briefing Note is an attempt to answer these questions, by comparing the consumption of local food plants in food scarcity and sufficiency periods, and its effects on achieving dietary diversity and quality throughout the year. It further addresses the role of local food plants in strengthening communities' coping strategies, in view of their demographic and socio-economic profiles. It also reflects the intention to raise awareness, stimulate discussions, and trigger feedback from a wider audience of stakeholders on the role that local food plants may play in improving nutrition and ensuring healthy and affordable diets. Finally, it provides information to support policies and legislation that promote diverse and healthy diets through the improved and sustainable use of biodiversity available in the environment.

2 Methodology

2.1 Household survey

The household survey took place from 2019 to 2021 at two different periods (scarcity season and sufficiency season) [Table 1]. Data was collected by local enumerators who speak the local language. They were trained by the Community Technology Development Trust (CTDT) whose staff pilot-tested the questionnaire before collecting the data. The household survey was conducted in a representative sample of communities, representing each agroecosystem and ethnic group in the project region. In each selected community, a random household sampling equivalent to 30% of all households living in the community took place to ensure statistical representativeness. For villages with 30 to 100 households, a sample of 30 households was used; for villages with 30 or fewer households, all households were interviewed. Households that had been living for less than one year in the community or households that had not been engaged in farming were excluded from the sample. All informants participated freely and with prior informed consent.

Table 1. *Data collection periods during scarcity and sufficiency seasons*

Scarcity season (round 1)	Sufficiency season (round 2)
November – December 2019	July 2021

This Briefing Note presents the results of the following survey modules: (1) demographic and socio-economic characteristics, (2) severity of food insecurity, (3) dietary diversity, (4) local food plant acquisition, (5) free-listings of local food plants, (6) features of the food scarcity season, and (7) sources of information modules of the household surveyb. The demographic and socio-economic module includes collected data that allowed the calculation of variables related to gender and household vulnerability, and that gave a general indication of the main productive activities of the household, among others. All interviews (except for the demographic and socio-economic module) were conducted in both food scarcity and sufficiency periods.

b The detailed explanation of each module, including the survey questionnaire, is accessible in the Baseline Tool document (http://bit.ly/2WSHfTf). The tool was revised and agreed upon with all partner organizations.

Food insecurity was measured using the Household Food Insecurity Access Scale (HFIAS) and the Household Hunger Scale (HHS)[7] [Table 2]. According to the HFIAS indicator guide[8], a food secure household experiences no food insecurity conditions, or it might rarely experience concerns on sufficient access to food. A mildly food insecure household often worries about not having enough food, it might be unable to eat preferred foods and have a more monotonous diet than desired, or it can even consume some foods considered undesirable. A moderately food insecure household often sacrifices quality more frequently, by eating a monotonous diet or undesirable foods and can start to cut back on quantity by reducing the size of meals or number of meals. Finally, a severely food insecure household has resorted to cutting back on meal size or number of meals and its members can still run out of food, go to bed hungry, or go a whole day without eating[8].

Table 2. *Food insecurity indicators and their definitions*

Food Insecurity Indicators	Abbreviation	Definition
Household Food Insecurity Access Scale	HFIAS	It measures the severity of household food insecurity during the past four weeks (30 days). It ranges from 0 to 27, indicating the degree of insecure food access. Households are categorized as food secure, mildly food insecure, moderately food insecure, or severely food insecure[7].
Household Hunger Scale	HHS	It is derived directly from the HFIAS and it includes only three hunger-related aspects of insecure food access: "little to no hunger in the household", "moderate hunger in the household", or "severe hunger in the household"[7].

A 24-hour dietary recall-based interview was also conducted to capture detailed information about all foods and beverages consumed by the respondent in the past 24 hours[9]. Based on the results of the 24-hour recall, the Household Dietary Diversity Score (HDDS), Micronutrient Sensitive HDDS (MsHDDS), the Food Variety Score (FVS) and Dietary Species Richness (DSR), were all calculated [Table 3].

Table 3. *Dietary diversity indicators calculated based on the 24-hour recalls, and their definitions*

Dietary Diversity Indicators	Abbreviation	Definition
Household Dietary Diversity Score	HDDS	It assesses a household's economic access to food (i.e. its ability to produce, purchase or otherwise secure food for consumption by all household members). The potential score range is 0-12[10].
Micronutrient Sensitive HDDS	MsHDDS	It disaggregates and reorganizes the HDDS food groups into 16 micronutrient based groups[11].
Food Variety Score	FVS	It measures the number of different food items consumed from all possible items eaten (individual foods, food mixtures, food categories, or a combination of these)[12].
Dietary Species Richness	DSR	It measures the number of different species consumed per day, assessing both nutritional adequacy and food biodiversity[13].

Local food plant acquisition events, based on a recall period of seven days, also captured the multiple environments from which local food plants were acquired, and gender roles related to their harvesting or gathering. A detailed explanation of how each index was calculated, alongside the rationale of each survey module, and the survey questionnaire itself are accessible upon request. The tools were revised and agreed upon by all partner organizations.

Each partner could adapt, test the tools, and include specific sections relevant to their own context.

The free listings of the food plants aim to provide an overview of local knowledge and were used for the development of a list of species based on the knowledge that is shared by community members. Given that knowledge is intrinsically related to gender, free listings were requested from the head of household and his/her spouse separately. The results of the free listings were analysed by using the cognitive salience index (CSI). The CSI combines frequency and order of mention across men's and women's lists for each plant species and reflects the knowledge of a specific plant (the higher the CSI, the higher the knowledge of that specific plant[14]. In addition, the species that are more widely used among households during the food scarcity season were identified using the traffic light exercise[15]. For that, the enumerator asked men and women to give a colour to each plant species in relation to the period when it is consumed, as follows:

- Green light: local food plant species is consumed during the sufficiency period, or when food may not be plentiful but generally available to the community in adequate quantities and qualities.
- Amber light: local food plant species is consumed during a period in which food reserves are alarmingly low.
- Red light: local food plant species is consumed during a situation in which the food supply is depleted, which condition requires emergency measures.

The food scarcity module not only assessed the months in which households have reduced access to food[16] but also captured the variety of local food plants consumed in times of food scarcity. The sources of information module captured the current and preferred sources of information for the community households on health, sanitation, and nutrition issues, to help design strategies to communicate with farmers by using preferred channels.

The data was analysed with descriptive and non-parametric statistics. Spearman rank correlations were calculated between ordinal or continuous variables. Kruskal-Wallis ranked tests estimated correlations between one nominal variable that has two or more categories and a continuous variable. Mann-Whitney tests estimated correlations between one nominal variable that has two categories and a continuous variable. Finally, Chi-Square tests were calculated between two nominal variables.

2.2 FFS diagnostic exercises

The FFS diagnosis took place in 2021 for 12 FFS established during that year in the Mashonaland Central, Mashonaland East, Masvingo, and Matabeleland North provinces of Zimbabwe. Data was collected by FFS facilitators who speak the local language. They were trained on the FFS approach for the work on nutrition and local food plants, including the conduction of diagnostic exercises and FFS activities, by the Community Technology Development Trust (CTDT) as part of the training of trainers. All FFS members participated freely and with prior informed consent.

This Briefing Note presents the results of the malnutrition problem tree, decision-making with respect to intra-household food distribution, and timeline analysis of local food plants and nutrition exercises from 19 FFS for which we had complete and good-quality data. The analysis of the data was mainly a descriptive exercise, showing patterns, frequencies, and means, where applicable. The FFS diagnostic exercises are detailed in the illustrated module 'Diagnostic Phase' of the FFS Field Guide, which also includes the forms by which results were reported. More information on the FFS work on Nutrition and Local Food Plants is provided in the SD=HS website and is summarized in the Online Course, accessible through the SD=HS website.

2.3 Household and FFS locations

In total, data were collected from 522 households for the baseline survey and 12 FFS for the Diagnostic exercise. Table 4 presents the distribution of the households and FFS surveyed across five districts of the Mashonaland Central, Mashonaland East, Masvingo, and Matabeleland North provinces of Zimbabwe. Most FFS surveyed were in Rushinga district, while no data for the FFS diagnostic exercise was collected from Chiredzi.

Table 4. *Distribution of sampled households and FFS across the four districts, involved in the activities indicated*

	FFS diagnostic exercise		Baseline survey	
Districts	Number of FFS	Percentage of total number of FFS	Number of households	Percentage of total number of households
Chiredzi	0	0%	111	21%
Mudzi	3	25%	97	19%
Rushinga	5	42%	101	19%
Tsholotsho	1	8%	103	20%
UMP	3	25%	110	21%
Total	**12**	**100%**	**522**	**100%**

Figures 1, 2, 3, and 4 below show the locations of the surveyed households and FFS within the different provinces of Zimbabwe. The map figures were prepared by Matteo Petitti.

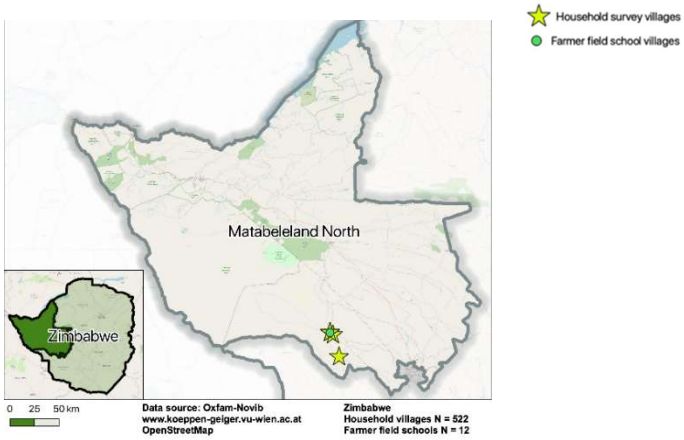

Figure 1. *Map indicating the location of households and FFS in Mashonaland Central province*

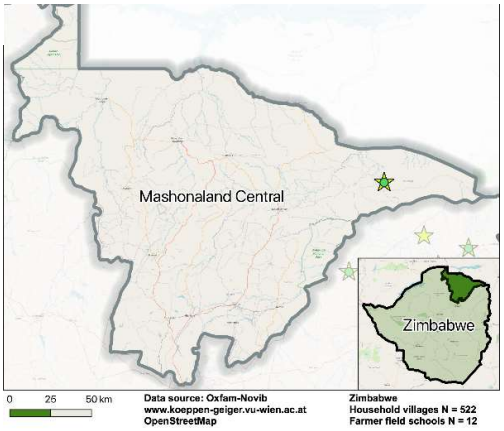

Figure 2. *Map indicating the location of households and FFS in Mashonaland Central province*

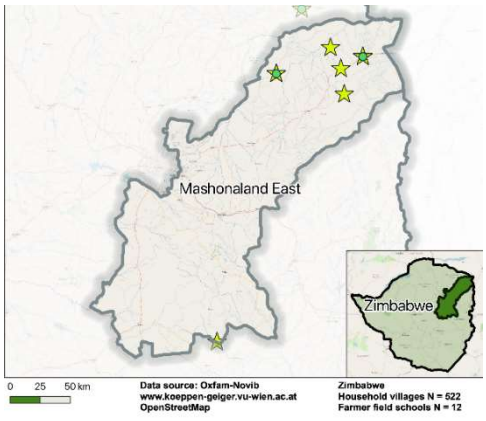

Figure 3. *Map indicating the location of households and FFS in Mashonaland East province*

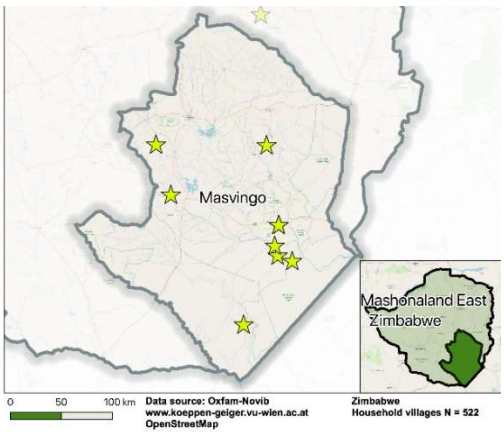

Figure 4. *Map indicating the location of households and FFS in Masvingo province*

3 Results

3.1 Indigenous peoples and smallholder farmers in Zimbabwe

Agroecological conditions determine largely which crops can be successfully grown and which farming conditions need to be fulfilled, e.g., irrigation, maximum time to maturity, dependence on fertilizers. Recently, climate change has caused the agroecosystems included in this study to become drier and rainfall patterns to become more irregular. Such changes bear heavily on crop production and food security.

Smallholder farmers surveyed in Zimbabwe live in agroecological regions 3, 4 and 5, which are characterized by a moderate climate with annual rainfall ranging from 500 to 650 millimeters[17]. Agroecological region 3 has an altitude ranging between 500 and 1,000 meters above sea level and receives an annual rainfall of 500 to 650 millimetres with average temperature of 18 to 25 degrees Celsius. In region 4, the altitude ranges between 300 and 500 meters above sea level, while the annual rainfall is between 450 and 550 millimetres and the temperature from 18 to 25 degrees Celsius. Region 5 is located at an altitude of 0 to 300 meters above sea level, with an annual rainfall of only 350 to 450 millimetres and temperatures ranging from 20 to 28 degrees Celsius.

According to the Holdridge Life Zone classification [18,19], 42% of the communities involved in this study are situated in the subtropical dry forests zone, while the locations of 37% of the rest areas are classified in the tropical dry forests zone. The remaining 21% is classified in the subtropical thorn steppe zone. Köppen Climate classification[20] indicates that the majority (81%) of the implementing areas have a climate of arid steppe/hot arid, while the remaining communities reside in a warm temperate/ winter dry/ hot summer climate (19%).

These regions are important for agriculture in Zimbabwe. They provide a variety of crops and they are home to a large number of people. The main ethnic groups in these regions are the Shona, the Ndebele, and the Kalanga. These populations rely on maize farming, groundnut and sorghum to sustain their livelihoods and they cultivate more than 90% of these crops for consumption. Hence, they are vulnerable to increasing droughts and other climate change impacts, which threaten food security and therefore require the development of more sustainable agricultural practices, including the adjustment of cropping systems.

Table 5 presents the socio-demographic characteristics of the participating communities. The households investigated had an average size of five household members and the majority of them (40%) belonged to the province Mashonaland East. The heads of the household were males in more than 70% of the households interviewed, indicating that female-headed households formed a sizable minority. The educational level and literacy rates of the surveyed households showed that 87% of household heads had completed at least primary education, while 13% do not know how to read or write. Agroecological conditions determine largely which crops can be successfully grown and which farming conditions need to be fulfilled, e.g., irrigation, time to crop maturity, fertilizers.

Table 5. *Results from socio-demographic module of baseline survey*

Socio-demographic variables	N	%	Mean	St. D.
Province				
Mashonaland Central	101	19%		
Mashonaland East	211	40%		
Masvingo	107	21%		
Matabeleland North	103	20%		
Household size			5.3	1.9
Sex of household head				
Man	373	75%		
Woman	125	25%		
Main occupation of household head				
On farm	351	71%		
Outside farm	33	7%		
Both	110	22%		
Age of household head			51.2	14.9
Literacy of household head				
Only read	6	1%		
Only write	16	3%		
Both	412	83%		
None	63	13%		
Education of household head				
Never attended formal education	63	13%		
Primary	174	35%		
Secondary	247	50%		
Highest education	12	2%		
Number of migrants per household			0.2	0.5
Number of children (incl. orphans) per household			2.7	1.7
Number of chronically ill people per household			0.3	1.1
Number of women in child-bearing age per household			1.2	0.9
Total land area (ha) per household			2.7	1.7
Main productive activities per household				
Agriculture	495	62%		
Livestock farming	233	29%		
Fishing	9	1%		
Hunting	2	0%		
Gathering	18	2%		
Other	45	6%		
Farm ownership				
Owned	316	63%		
Rented	4	1%		
Borrowed from family or friends	14	3%		
Communal land	165	33%		
Other	1	0%		
Number of crops grown in the past 12 months, and for what use			3.4	1.3
Sales			0.8	1.2
Consumption in the household			3.1	1.3
Barter			0.1	0.3
Market orientation (proportion of harvest for sale)			0.2	0.3
Presence of income from non-agricultural activities	183	37%		
Presence of home garden	286	57%		

- The results are based on the baseline household survey, in which 522 households participated. Provinces: N=522 (missing values=0); Household size: N=501 (missing value=21) ; Sex of household head: N=498 (missing value=24); Main occupation of household head: N=494 (missing values=28); Age of household head: N=496 (missing values=26); Literacy of household head: N=497 (missing values=25); Education of household head: N=496 (missing values=26); Number of migrants: N=501 (missing values=21); Number of children: N=501 (missing values=21); Number of chronically ill people: N=501 (missing values=21); Number of women in child-bearing age: N=501 (missing values=21); Total land area: N=499 (missing values=23); Main productive activities: N=500 (missing value=22); Farm ownership: N=500 (missing values=22); Number of crops grown on the past 12 months: N=497 (missing value=25); Market orientation: N=500 (missing value=22); Presence of income from non-agricultural activities: N=501 (missing values=21); Presence of home garden: N=500 (missing values=22). The percentages are calculated over the valid number of responses for each variable, excluding missing values.

In terms of their productive activities, more than 60% of the households interviewed work in agriculture, almost 30% of them in livestock farming and more than 60% own the farm on which

they live and work. An average total of three crops were grown by the households in the past 12 months and the average sale proportion from their harvest is 20%, while the rest was mostly consumed in the household. Interestingly, almost 40% of the households had an income from non-farming activities and 57% of them operated a home garden.

3.2 Local causes and consequences of malnutrition

The diagnostic exercises addressed the causes and consequences of malnutrition using the Malnutrition Tree as a tool. An important cause of malnutrition mentioned by the FFS participants was the lack of knowledge on the management and ways of preparation of local food plants (NUS) [Table 6]. Access to food and food shortage were mentioned 8 times over the total number of 12 FFS, indicating the important role of climate and socioeconomic level on nutrition. Indeed, poverty (15%), environmental challenges (9%), and cropping system limitations (7%) were also mentioned multiple times by the FFS participants. Responses like "imbalanced diet" and "poor diet", that do not reveal the root causes of malnutrition, were reported 13 times (in total) by the FFS participants. In conclusion, lack of knowledge, regarding both the management and ways to prepare food from LFPs, is the major argument listed.

Table 6. *Causes of malnutrition as reported by FFS participants*

Malnutrition cause	Number of answers	Percentage of answers	Details and examples
Knowledge lacks or gap	9	20%	Including poor cooking skills, lack of knowledge on what type of food to consume
Access to food	8	17%	Failing to harvest enough food for the whole season, food shortages, lack of food, unequal food distribution
Imbalanced diet	7	15%	Not eating balanced diet, limited dietary diversity, eating the same type of food
Poverty	7	15%	Including poor health and social problems
Poor diet	6	13%	Feeding solid food to a baby before the recommended 6 months, eating improperly cooked food, eating refined foods
Environmental challenges	4	9%	Natural disasters, drought
Cropping system limitations	3	7%	Low yields, crop failures
Cultural attitude/stigma	2	4%	Religious beliefs
Total	**46**	**100%**	

- The details and examples are taken directly from the FFS diagnostic reports. The way the question was asked allowed FFS to give more than one open responses. During data analysis, the responses were then grouped into categories. The percentages are calculated over the total number of answers (N=46) collected from the 12 FFS.

The most important consequences of malnutrition reported, 10 out of 48 times by the FFS participants were illnesses, social challenges, (e.g. crime, domestic violence, etc.) and weight loss or stunted growth [Table 7]. Overall weakness and low productivity also scored as very important malnutrition consequences which was mentioned eight times by the participants of the 12 FFS. Similarly important consequences seemed to be the resulting poor life expectancy or even death which were mentioned seven times within the FFS. Obesity and non-communicable diseases were reported three times by the participants and such effects might result from the consumption of cheap, calorie-rich but vitamin-poor food items, which are consumed by lack of better-quality food and regular proper meals.

Table 7. *Consequences of malnutrition as reported by FFS participants.*

Malnutrition consequence	Number of answers	Percentage of answers	Details and examples
Illnesses	10	21%	Blindness, poor development, poliomyelitis, rickettsia
Social and household challenges	10	21%	Crime, domestic violence, teenage pregnancies
Weight loss or stunted growth	10	21%	Including kwashiorkor and marasmus
Overall weakness, lethargy and low productivity	8	17%	Poor performance in schools and dropouts, adults unable to work in the fields, body too weak to fight disease
Poor life expectancy or death	7	15%	Disability, deformities, death, miscarriages
Obesity and non-communicable diseases	3	6%	Overweight people, risk of non-communicable diseases
Total	**48**	**100%**	

- The details and examples are taken directly from the FFS diagnostic reports. The way the question was asked allowed FFS to give more than one open responses. During data analysis, the responses were then grouped into categories. The percentages are calculated over the total number of answers (N=48) collected from the 12 FFS.

The vast majority of the FFS (83%) reported that their nutrition status had worsened in their village over the last 30 years [Table 8], whereas only two FFS reported that nutrition had improved over the same period. These overall negative results may be related to an increased share of staple crops leading to a less diverse diet, and a decreased access to additional minor crops, including local food plants.

Table 8. *Nutrition changes in the village in the last 30 years*

Changes in nutrition	Number of FFS	Percentage of FFS
Worsened	10	83%
Improved	2	17%
Total	**12**	**100%**

- The details and examples are taken directly from the FFS diagnostic reports. The question asked was "Has the nutrition in the village changed in the last 30 years?". Percentages are calculated over the total number of the 12 FFS that participated.

Lack of knowledge regarding local food plants and lack of associated policy support (32%) seemed to be the main factors that affected the nutritional status of the household [Table 9]. Globalization and Westernized eating habits (18%), low consumption of local foods (18%), and general food shortage (18%) were each mentioned four times in the 12 FFS. Finally, the lack of seeds and the lack of updated agronomic methods were reported three times by the FFS participants. These causal factors are likely interrelated, as already pointed out above.

Table 9. *Major factors that affected the nutritional status of the households*

Factors influencing the change	Number of answers	Percentage of answers	Details and examples
Lack of knowledge and policy support	7	32%	Lack of knowledge towards consumption of local food plants, lack of knowledge on the importance of the nutritional value of the local food plants, poor information dissemination, policies which do not recognise NUS nutritional value
Globalization and change in habits	4	18%	Relying on modern foods that are less nutritious and are refined, more consumption of junk food
Low consumption of local food	4	18%	Lack of NUS consumption
Food shortage	4	18%	Food shortage, food unavailability
Lack of local crops/seeds and proper agronomic methods	3	14%	Reduced productivity, monocultures
Total	**22**	**100%**	

- The details and examples are taken directly from the FFS diagnostic reports. The way the question was asked ("What were the major factors that affected the nutritional status of the households?") allowed FFS to give more than one open responses. During data analysis, the responses were then grouped into categories. The percentages are calculated over the total number of answers (N=22) collected from the 12 FFS.

3.3 Understanding local diets

The baseline survey showed that household dietary diversity was significantly higher in the sufficiency season than in the scarcity season [Table 10]. This could be attributed to the higher food availability during the sufficiency season that allows household members to source a greater variety of foods. It is important to note here that both the HDDS and MsHDDS indicators simply group food plants in categories such as cereals, tubers, vegetables, fruits, and legumes and only measure to which extent the household diet contains crops from these groups. Unfortunately, these indicators cannot capture the diversity of food plants consumed within each food group, e.g. diversity of vegetables, fruits, etc. FVS and DSR[12,13] indicators have helped us to capture this level of information although the data collected on them are not fully sufficient.

Table 10. *Dietary diversity (HDDS, MsHDDS, FVS and DSR) differences between scarcity and sufficiency seasons*

Dietary diversity	Scarcity season (mean ± sd)	Sufficiency season (mean ± sd)
HDDS (0-12)**	4.3 ± 1.7	4.9 ± 1.9
MsHDDS (0-16)**	4.7 ± 1.9	5.6 ± 2.4

- The results come out the baseline household survey, in which 522 households participated. During the first survey round (scarcity season) 27 values were missing (N=495), while during the second survey round (sufficiency season), 25 values were missing (N=497). Data collection errors did not allow for the analysis of the FVS and DSR indicators. One star (*) indicates a p-value < 0.05. Two stars (**) indicate a p-value < 0.01.

Regarding the dietary diversity in terms of specific food groups, we noted that cereals and vegetables are the most consumed food groups during both the scarcity and sufficiency seasons [Table 11]. While food availability is generally lower during scarcity periods, cereals, fruits, sweets, and spices appeared to be consumed significantly more frequently during the scarcity periods compared to the sufficiency periods. In contrast, tubers, eggs, legumes, dairy, and oils are consumed significantly more during the sufficiency season. No statistically significant difference was found in the consumption of fruits, meat, and fish between the two seasons. These results suggest that improving the role of local food plants (which belong to

various food groups) in local diets might be important throughout the year regardless of the nature of the season.

Table 11. *Main food groups consumed during the scarcity and sufficiency seasons*

Food Group	Scarcity season		Sufficiency season	
	N	% HHS	N	% HHS
Cereals**	497	23.1%	470	19.2%
White tubers and roots**	14	0.7%	152	6.2%
Vegetables*	411	19.1%	432	17.7%
Fruits	200	9.3%	170	7.0%
Meat	82	3.8%	85	3.5%
Eggs**	31	1.4%	59	2.4%
Fish and other seafood	37	1.7%	31	1.3%
Legumes, nuts, and seeds**	106	4.9%	254	10.4%
Milk and milk products**	19	0.9%	103	4.2%
Oils and fats**	270	12.6%	440	18.0%
Sweets**	202	9.4%	61	2.5%
Spices, condiments and beverages**	279	13.0%	188	7.7%
Total	2148	100.0%	2445	100.0%

- The results are deduced from the baseline household survey, in which 522 households participated. During the first survey round (scarcity season) 21 households were missing (N=501), while during the second survey round (sufficiency season), 30 households were missing (N=492). One star (*) indicates a p-value < 0.05. Two stars (**) indicate a p-value < 0.01.

3.4 Local food plants diversifying the diet

Table 12 presents the food groups in which some important local food plants in Mashonaland Central, Mashonaland East, Masvingo, and Matabeleland North provinces of Zimbabwe are represented. These plants have been selected for their importance in food scarcity season and/or due to their high nutritional value.

Table 12. *Important local food plants and food groups*

Scientific name	English name	Local name	Food group
Cleome gynandra L.	spider flower	nyevhe	vegetables
Abelmoschus esculentus (L.) Moench	okra	derere	vegetables
Amaranthus thunbergii Moq.	pig weed	mowa	vegetables
Vigna unguiculata (L) Walp.	cowpeas	cowpea	legumes
Sorghum bicolor (L.) Moench	sorghum	mapfunde	cereals
Adansonia digitata L.	baobab fruit	mauyu	fruits
Adansonia digitata L.	baobab leaves	okra kawuyu	vegetables
Eleusine coracana Gaertn.	finger millet	rukweza	cereals

It is important to note that out of the 105 local food plants identified in the 12 FFS, 63 of them were mentioned because of their nutritional importance [Table 13]. Forty-four percent of these plants were mentioned because of their medicinal value, while less than 1% of the local food plants were reported due to their availability in scarcity periods and due to their versatility in preparations. It shows that local food plants can play a major role in combatting food and nutrition insecurity in particular during the scarcity period when they are mostly needed.

Table 13. *Perceived importance of local food plants used in times of food scarcity*

Perceived importance	Number of plants	Percentage of plants
Nutritional value	63	60%
Medicinal value	46	44%
Available in times of scarcity	1	1%
Versatile preparations	1	1%

- The results come out the FFS diagnostic exercise, for which data was collected out of 12 FFS. In total, 105 local food plants were identified. Percentages reflect the number of plants divided by the total number of plants identified in this exercise (N=105). For some plants, no perceived importance was assigned.

3.5 Measuring the severity of food insecurity

The baseline survey showed that household food insecurity was significantly higher during the scarcity season compared to the sufficiency season [Table 14]. This could be explained by the decreased food availability that appears during the scarcity season. This demonstrates the crucial negative impact that lean periods have on household food security.

Table 14. *Food insecurity (HFIAS, HHS) differences between scarcity and sufficiency seasons*

Food Insecurity	Scarcity season (mean ± sd)	Sufficiency season (mean ± sd)
HFIAS (0-27)**	14.0 ± 7.9	7.9 ± 8.0
HHS (0-6)**	1.7 ± 2.0	0.8 ± 1.7

- The results come out the baseline household survey, in which 522 household participated. During the first survey round (scarcity season) 21 values were missing (N=501), while during the second survey round (sufficiency season) 25 values were missing (N=497). One star (*) indicates a p-value < 0.05. Two stars (**) indicate a p-value < 0.01.

The HHS index, which measures hunger, is derived directly from the HFIAS, but it only assesses the most severe experiences of food insecurity. Table 15 shows that during the scarcity season, more than 45% of the interviewed households were experiencing moderate or severe hunger, which is significantly higher than during the sufficiency season. Almost 9% of the households experienced severe hunger during the sufficiency season, with only 6.5% of the households experiencing moderate hunger. Again, this demonstrates the crucial impact that lean periods have on the lack of household food security.

Table 15. *Percentage of households that suffer from food scarcity throughout the year*

Household Hunger Scale (HHS)	Scarcity season		Sufficiency season	
	N	% Hhs	N	% Hhs
Little to no hunger (% total Hhs)**	275	54.9%	417	79.9%
Moderate hunger (% total Hhs)**	145	28.9%	34	6.5%
Severe hunger (% total Hhs)**	81	16.2%	46	8.8%

- The results are calculated based on the data from the baseline household survey, in which 522 households participated. During the first survey round (scarcity season) 21 values were missing (N=501), while during the second survey round (sufficiency season) 22 values were missing (N=500). One star (*) indicates a p-value < 0.05. Two stars (**) indicate a p-value < 0.01.

3.6 The food scarcity period

Given the direct relation between food scarcity and food insecurity, it was important to look into the current length of the scarcity period within the investigated areas in Zimbabwe. Table 16 presents the percentage of households in Mashonaland Central, Mashonaland East, Masvingo, and Matabeleland North provinces that suffer from food scarcity throughout the year. Although October and November seem to be the months showing the largest shortages, with more than 50% of households experiencing food scarcity, high food shortages are reported over a longer period ranging from August to February. This highlights the severity of the scarcity period as it concerns households over a major part of the year.

Table 16. *Percentage of households that suffer from* **food scarcity indicated per calendar month**

Months	Percentage of households
January	39%
February	29%
March	17%
April	11%
May	11%
June	14%
July	18%
August	26%
September	41%
October	57%
November	63%
December	42%

- The results come out the first round of the baseline household survey, in which 501 household participated and 2 values (Hhs) were missing (N=499).

The most important characteristic of the food scarcity season, mentioned by nine of the 27 responses within the 12 FFS, was the reduced overall food consumption [Table 17]. Consumption of local or wild food plants and poor access to food were reported seven times as important characteristics of the scarcity season within the FFS. Four of the responses mentioned that the food scarcity season is characterized by casual labour and migration which may be considered financial coping measures.

Table 17. *Characteristics and definition of the scarcity season as mentioned by the FFS participants*

Characteristics of the scarcity season	Number of answers	Percentage of answers	Details and examples
Reduced food intake	9	33%	Reduced number of meals and meal size; eating only once a day; consumption of less preferred food
Consumption of local/wild plants	7	26%	Gathering of wild fruits
Poor access to food	7	26%	Lack of food especially staples; food shortages; high dependence on food handouts
Casual labour or migration	4	15%	Forced temporary migration; gold panning
Total	**27**	**100%**	

- The details and examples are taken directly from the FFS diagnostic reports. The way the question was asked allowed FFS to give more than one open responses. During data analysis, the responses were then grouped into categories. The percentages are calculated over the total number of answers (N=27) collected from the 12 FFS.

3.7Food plants during the food scarcity season

The average number of food plant species used during the period of food scarcity per household was 1.8 (± 1.5). Table 18 presents the most frequently consumed food plants in times of scarcity. Wild yam, sorghum, okra, and cat's whiskers were the plants mentioned with the highest frequencies (>10% of the households). Although sorghum is considered to be a major staple food, rather than a local food plant, it appears to play an important role during food scarcity, perhaps in reduced volumes.

Table 18. *Key food plant species used during food scarcity period*

Food plants used in food scarcity	Scientific Name	Number of households	Percentage of households
wild yam	*Dioscorea steriscus*	79	18%
sorghum	*Sorghum bicolor*	72	16%
okra	*Corchorus olitorius*	53	12%
cat's whiskers	*Cleome gynandra*	50	11%

cowpea	*Vigna unguiculata*	27	6%
monkey orange	*Strychnos spinosa*	23	5%
jujube	*Ziziphus mauritiana*	12	3%
water berry	*Lannea eduli*	8	2%

- The results come out the baseline household survey, in which 522 households participated. In total, 21 values were missing (N=501).

3.8 Multiple environments can support diverse diets: Local food plant acquisition

Sourcing of local food plants

In the scarcity period, a significant number of households (37%) reported having purchased at least one of the local food plants they mentioned as part of their diet. An almost equal number said they sourced the local food plants they mentioned either through gathering (24%) or harvesting from their own fields or home gardens (22%). During the sufficiency period, the majority of the households (51%) gather at least one of the local food plants they mentioned, while many harvest (33%), and only a few of them purchase (11%). This may indicate that despite the important role of gathering and harvesting local food plants in periods of food scarcity, availability or yields might be lower during scarcity, perhaps due to lack of water and other inputs, leading households to food purchases.

During the scarcity period, a significantly greater variety of species (39) was reported to be gathered compared to the sufficiency season (28). Similar differences between the seasons were also reported for plants that were purchased (32 during scarcity compared to 16 in the sufficiency season) or harvested (49 in scarcity compared to 30 in the sufficiency season). This demonstrates that during food scarcity periods, households are forced to source a greater variety of local food plants as sufficient availability of major crops is not guaranteed.

Sites where the local food plants originate from

The majority of the local food plants listed are collected from the agricultural field or the forest in both scarcity and sufficiency periods [Table 19]. While in scarcity season a greater variety of species were acquired from the agricultural field and the market, during sufficiency season, a greater variety of plants were collected from the home garden, the forests, and other public spaces. This might mean that despite the important role of home gardens, forests, and public spaces in food provision during the scarcity season, their availability or yields might be lower, perhaps due to lack of water and other inputs.

Table 19. *Number of plant species and sites where they originate from*

Place of origin	Scarcity season		Sufficiency season	
	Number of species	Percentage of species	Number of species	Percentage of species
Agricultural field	45	50.6%	16	31.4%
Home garden	27	30.3%	20	39.2%
Forest	37	41.6%	24	47.1%
Public spaces	21	23.6%	17	33.3%
Roadside	19	21.3%	9	17.6%
Lake	0	0.0%	1	2.0%
Riverside	2	2.2%	7	13.7%
Market	28	31.5%	13	25.5%
Other	19	21.3%	9	17.6%

- The results come out the baseline household survey, in which 522 households participated. In total, 146 households were missing in the scarcity period (N=376), and 218 during the sufficiency period (N=304). Percentages reflect the number of species brought from each different place, divided by the total number of different species mentioned. During the first survey round (scarcity season), 89 plant species were mentioned, while during the second survey round (sufficiency season) 51 species were mentioned. One star (*) indicates a p-value < 0.05. Two stars (**) indicate a p-value < 0.01. - Public spaces are a grouped category and consist of the combination of roadsides, lakes and riversides.

3.9 Women's and men's roles in local food plant acquisition

Household members that acquire local food plants for the household

Baseline survey data showed that women bring home the majority of species during both the scarcity (90%) and sufficiency (77%) seasons, compared to other family members [Table 20]. Men and children also bring quite a variety of local food plants to their households, without major variations during the two seasons. Whereas the species provided by women and men show considerable overlap, the total number provided by women is substantially larger. This demonstrates the important role women have in sourcing local food plants and nourishing the family.

Table 20. *Number of plant species that are acquired by various family members*

Family member	Scarcity season		Sufficiency season	
	Number of species	Percentage of species	Number of species	Percentage of species
Man	49	55%	24	47%
Woman	80	90%	39	77%
Both genders	9	10%	9	18%
Children	0	0%	18	35%
Others	12	14%	3	6%

- The results are based on the baseline household surveys, in which 522 households participated. In total, 146 households were missing in the scarcity period (N=376), and 219 during the sufficiency period (N=303). Percentages reflect the number of species brought from each different place, divided by the total number of different species mentioned per season. During the first survey round (scarcity season) 89 different plant species were mentioned, while during the second survey round (sufficiency season), 51 different species were mentioned. One star (*) indicates a p-value < 0.05. Two stars (**) indicate a p-value < 0.01.

3.10 Women's and men's knowledge on local food plants (Free listings)

Individual men (5.9 ± 4.2) listed a slightly higher number of plants they knew than individual women (5.4 ± 3.4), indicating that men and women have more or less equal knowledge of local food plants. In addition, men reported a higher variety of plant species per person (161 different species/ 277 men), compared to women (206 different species /448 women), though women as a group reported a higher total number of different species in total. Almost all plant species were listed by the two genders with similar frequencies. Interestingly, the Sutrop CSI indicator[14] which also takes into account the order in which the plants are mentioned, indicated that women and men have only slightly different knowledge of the plant species concerned, meaning that they would list the same plant in slightly different frequencies or orders. For example, men indicated a higher knowledge of plants like sorghum and wild yam, while women indicated more knowledge of plants like cat whiskers and okra. Annex 1 presents the full list of plants and the frequencies in which species were mentioned by men and women, including the Sutrop CSI index[14].

3.11 Relationships with dietary diversity and food insecurity indicators

A significantly negative relationship was found between the number of crops grown in the past 12 months for consumption and the household food insecurity indicator *HFIAS* ($p<0.001$) during both food scarcity and sufficiency seasons. This suggests that the more food-insecure households grow a lower number of crops for household consumption throughout the year. This relationship could be attributed to the households' financial limitations or lack of assets that make them more vulnerable to food insecurity.

Similarly, a significantly negative relationship was found between the number of local food plants that were acquired by households and associated food insecurity levels (HFIAS) ($p<0.01$) during both seasons, meaning that the more food insecure households bring a smaller number of local food plants to their homes. This might suggest that, regardless of the time of the year,

the consumption of local food plants could improve food security for the households in the implementing communities, and that their promotion is very important.

No significant relationship was found between the number of local food plants that were brought home and households' dietary diversity (HDDS or MsHDDS). However, a significantly positive relationship was found between the number of crops grown in the past 12 months for consumption and household dietary diversity as expressed in the HDDS indicator, but only during the food scarcity period ($p<0.001$). This means that households that grow a wider variety of crops do have access to diets with wider diversity during the scarcity period. Likewise, a significantly positive relationship was found between the number of crops grown in the past 12 months for consumption and the micronutrient-sensitive household dietary diversity (MsHDDS) ($p<0.001$), again only during scarcity season, meaning that the households that grow a larger number of crops for consumption have more diverse diets and take in a bigger variety of nutrients.

3.12 Intra-household decision making

Worldwide, women play a key role in safeguarding the nutrition of their families through their wide knowledge of local food plants, which allows diversification of diets and higher nutrient intake. Empowering them can contribute to their own food and nutrition security and that of their families[21]. However, in many cultures, there are major gender inequalities in relation to access to and control over resources, including food, with major consequences for the nutrition of women and children. Land is traditionally passed on to male family members as they reach adulthood, as according to local culture female family members will not need it after their marriage. In addition, men are usually in charge of the staple crops that are produced for both consumption and sale, such as maize. Women, on the other hand, tend to take responsibility for smaller crops like legumes that are mostly grown for household consumption (e.g. cowpea and Bambara nut). Women are also the ones who usually decide what to cook as they will know better what is available in the household.

Indeed, all FFS indicated that mothers are the ones who decide what to eat in the household, while eight out of the 12 FFS reported that fathers have also an input in such decisions [Table 21].

Table 21. *Decision making member regarding what to eat in the household*

Decision making member	Number of FFS	Percentage of FFS
Mother	12	60%
Father	8	40%

- The details and examples are taken directly from the FFS diagnostic reports. The way the question was asked ("Who decides what to eat in the household?") allowed FFS to give more than one response: 1= Father, 2= Mother, 3= Children, 99= Other, please specify [multiple options allowed]. During data analysis, the responses were then grouped into categories. The percentages are calculated over the 12 FFS analysed.

All FFS reported that both fathers and mothers were the most powerful household members in providing access to food, including from other sources than the owned farm, whereas a small number (11%) recognized the role of sons in the decision-making [Table 22].

Table 22. *Most powerful household members in terms of access to food*

Most powerful member	Number of FFS	Percentage of FFS
Father	12	44%
Mother	12	44%
Son	3	11%

- The details and examples are taken directly from the FFS diagnostic reports. The way the question was asked ("Who are the most powerful household members in terms of access to food?") allowed FFS to give more than one response: 1= Father, 2= Mother, 3=

Children, 99= Other, please specify [multiple options allowed]. During data analysis, the responses were then grouped into categories. The percentages are calculated over the 12 FFS analysed.

Eight out of the 12 FFS (40%) reported that female in-laws and step-children are the least powerful household members in terms of access to food, while three FFS reported that children are the least powerful household members [Table 23]. One FFS also reported that the elderly has the least power in terms of access to food.

Table 23. *Who are the least powerful household members in terms of access to food?*

Weakest members	Number of FFS	Percentage of FFS
female in-laws	8	40%
step-children	8	40%
children	3	15%
elderly	1	5%

- The details and examples are taken directly from the FFS diagnostic reports. The way the question was asked ("Who are the least powerful household members in terms of access to food?") allowed FFS to give more than one response: 1= Father, 2= Mother, 3= Children, 99= Other, please specify [multiple options allowed]. During data analysis, the responses were then grouped into categories. The percentages are calculated over the 12 FFS analysed.

Overall, Tables 21, 22, and 23 indicate that although women are most important in the intra-household food distribution, that is they decide what to do with the food that is already available, the two genders have similar power in accessing food from any source and providing it to their household.

Interestingly, a relationship is suggested between the gender of the household member that decides about the income from the main farming activities and the number of plants listed by that gender, indicating that farming activities enhance the general knowledge of the crops and wild plants occurring in the agroecosystem. More specifically, the length of the men's list of plants was significantly higher (more plants mentioned) in the households where men decided what to do with the income from farming activities ($p<0.05$). No significant relationship was found between the length of women's list of plants and women's decision-making. However, a link could be assumed between decision-making power and local knowledge, meaning that if women have more decision-making power, their knowledge of local food plants will be more profound (and vice versa).

3.13 Evaluation of coping strategies and possible solutions

The main coping strategies to fight food insecurity are casual labour, migration, and buying food on credit, as they were reported 19 out of 64 times throughout the 12 FFS [Table 24]. Relying on neighbours and family was reported 15 times, while consumption of local food plants was mentioned 10 times by the FFS participants. This could mean that many participants are unaware of the nutritional benefits of local food plants, and therefore do not use them as much as they could. Selling or renting out assets was reported 9 times while reducing the quality of the diet (e.g. reducing portions, skipping meals) was mentioned 6 times within the 12 FFS. Management changes in the household and other sourcing strategies (e.g. hunting and fishing) were reported by less than 5% of the answers in the FFS. It is important to note that agriculture-related coping strategies are mentioned less frequently than non-agriculture-related ones. This might be an artefact of the way the question was asked to the FFS participants.

Table 24. *Main strategies used to cope with the scarcity season and their severity as reported by the FFS participants*

Coping strategies	Number of answers	Percentage of total answers	Details and examples
Casual labour, migration or (over)spending for food	19	30%	Gold panning; migration to find work; selling thatch grass; bartering work for food; buying on credit
Relying on neighbours and family for food/money	15	23%	Eating from neighbours' homes; borrowing food; receiving remittances
Consumption of local/wild plants (sometimes stigmatised)	10	16%	Gathering wild fruits; harvesting immature crops; consuming seed stocks
Renting or selling farm and HH assets	9	14%	Selling small stocks; selling productive assets
Worsening of diet and nutrition	6	9%	Reducing portion size; skipping meals
Changes to household management/relations	3	5%	Feeding young and elderly; child marriages; divorces
Hunting/fishing	2	3%	-
Total	**64**	**100%**	

- The details and examples are taken directly from the FFS diagnostic reports. The way the question was asked allowed FFS to give more than one open responses. During data analysis, the responses were then grouped into categories. The percentages are calculated over the total number of responses (N=64) collected from the 12 participating FFS.

Malnutrition is often associated with food scarcity and is one of the specific consequences of the latter. The most popular counter strategies to combat malnutrition reported 38 out of 147 times by the FFS participants were better food preparation and cooking demonstrations [Table 25]. Sowing local food plants also scored high, as it was reported 32 times within the 12 FFS, while harvesting of local food plants was reported an additional nine times. Discussions in seed fairs and food fairs were also reported as gateways of possible solutions to malnutrition by 15% of the participants' answers. Other proposed solutions like better food preservation, seed storage, seed germination and the creation of school gardens were mentioned by less than 10% of the answers in the FFS. In general, practical demonstrations of applicable knowledge (including growing or managing food plants, processing, and cooking) were often reported as a desired contribution to better nutrition, indicating their significance in knowledge-sharing efforts.

Table 25. *Possible solutions to malnutrition by farmers*

Solutions	Number of answers	Percentage of answers	Related research objective
Food preparation and cooking demonstrations	38	26%	To use cooking demonstrations to come out with the most favoured recipe; to find new ways of preparing
Sowing local food plants	32	22%	To multiply seed; to increase production and conservation
Seed fairs and food fairs	22	15%	To discuss the benefits and nutrition value of foods
Food preservation	14	10%	Solar drying of vegetables
Seed storage	13	9%	To increase seed stock
Seed germination and breaking seed dormancy	13	9%	To experiment germination rates using different seed treatments
Harvesting wild food plants	9	6%	To identify edible types for consumption; to collect wild food plants for processing
Creating school gardens	6	4%	
Total	**147**	**100%**	

- The details and examples are taken directly from the FFS diagnostic reports. The way the question was asked allowed FFS to give more than one open responses. During data analysis, the responses were then grouped into categories. The percentages are calculated over the total number of responses (N=147) collected from the 12 participating FFS.

3.14 Preferred ways to promote the use of local food plants by local communities

Health facilities and community health services are the channels by which most households obtain information on the benefits of local food plants, and these are also most preferred [Table 26]. Radio is the next source of information that is being used and acknowledged by 30% and 19% of the responding households, respectively. It is important to notice that no reference is made to extension services and that agriculture-related information sources are only preferred by 14% of the interviewed households. This suggests that support to cope with food scarcity and dietary needs is better received when obtained from health providers.

Table 26. *Current and preferred sources of information*

Sources of information	Current sources		Preferred sources	
	N	% Hhs	N	% Hhs
Neighbours	35	8%	25	5%
Health facilities	222	49%	172	35%
Community health services	356	78%	315	64%
Support group, farmer group, FFS	92	20%	71	14%
NGOs	34	7%	16	3%
Radio	137	30%	91	19%
School children	83	18%	54	11%
TV	4	1%	1	0%
Pamphlet	22	5%	1	0%
Cell phone	110	24%	70	14%
Other	42	9%s	34	7%

- The results come out the first round of baseline household survey, in which 501 household participated and 45 values (current sources, N=456) and 11 values (preferred sources, N=490) are missing. The questions were asked in a way that allowed households to provide multiple responses. Percentages reflect the number of households that mentioned the source of information, divided by the number of households that responded the question.

4 Conclusions

In summary, this report emphasizes the pivotal role of reintroducing local food plants into community diets to bolster both food and nutrition security. Farmer Field School (FFS) interviews shed light on the cultivation practices in the studied communities, with households growing an average of three crops in the past year. However, a concerning aspect is the low proportion of harvests sold (20%), highlighting a heavy reliance on household consumption. FFS participants stress the lack of knowledge on managing and preparing local food plants, echoing the need for broader education and awareness programs on their nutritional value and culinary methods.

Disturbing trends in nutrition status, reported by the majority of FFS participants, reveal an 83% consensus on a worsening situation in their villages over the last 30 years. This negative trajectory may be linked to an increased dependence on staple crops, leading to a less diverse diet and reduced access to minor crops, including local food plants. The baseline survey indicates higher household dietary diversity during sufficiency seasons due to increased food availability. Yet, consumption patterns during scarcity periods highlight a reliance on cereals, underscoring the necessity of elevating the role of local food plants in year-round diets.

During scarcity periods, households exhibit resilience by sourcing a greater variety of local food plants, with women playing a pivotal role in enhancing dietary diversity. The stark contrast in food security between scarcity and sufficiency seasons, where over 45% of households experience moderate or severe food insecurity during scarcity, underscores the urgency for effective counter strategies. Popular suggestions include improved food preparation demonstrations, increased cultivation of local food plants, and active participation in discussions at seed and food fairs.

To address food and nutrition security challenges, it is recommended to formulate policies incentivizing the cultivation and consumption of indigenous foods. Providing subsidies to farmers cultivating these foods can promote broader adoption and sustainable farming practices, enhancing community-level food security. Investing in research and offering grants or subsidies for transitioning to indigenous crop cultivation can contribute to the long-term resilience of local food systems. Maximizing access for vulnerable populations involves improving the accessibility and market presence of indigenous food crops, creating markets, and providing tax breaks to businesses involved in their production. In summary, integrating indigenous food crops into policy frameworks, research initiatives, and market dynamics holds significant promise for addressing food and nutrition security challenges effectively.

This report strongly suggests that local food plants can play a pivotal role in addressing food and nutrition security challenges, regardless of the season. Enhancing the capacity of communities to grow, collect, process, and prepare food from these species is essential for building resilience and improving overall well-being. As we move forward, targeted interventions, education programs, and community engagement initiatives should focus on promoting the sustainable integration of local food plants into the daily diets of these communities, thereby contributing to long-term food and nutrition security.

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6 ANNEX 1. KNOWLEDGE OF LOCAL FOOD PLANTS

			Freelistings											Food Scarcity		
Food plant	English name	Scientific name	Total number (men + women)	Number of men	Number of women	Sutrop CSI men	Sutrop CSI women	% of men that indicated traffic light:			% of women that indicated traffic light:			% of hh that indicated traffic light:		
								green	amber	red	green	amber	red	green	amber	red
abhizha			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	0%	0%			
amajodo														0%	100%	0%
amalamba														0%	100%	0%
amanda fruits			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
amaqebelengwana			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%	0%	50%	50%
amaranthus	amaranthus		23%	20%	26%	0.06	0.07	15%	47%	38%	9%	47%	43%	11%	34%	54%
amarata														0%	100%	0%
amarula			1%	1%	1%	0.00	0.00	0%	33%	67%	50%	25%	25%	0%	100%	0%
apple	apple		1%	0%	1%	0.00	0.00	0%	100%	0%	0%	100%	0%			
babari			2%	2%	2%	0.01	0.00	0%	80%	20%	0%	71%	29%			
bambara nut	bambara nut		9%	13%	7%	0.03	0.01	14%	47%	39%	6%	53%	41%			
banana	banana		4%	5%	4%	0.01	0.00	0%	100%	0%	6%	94%	0%	33%	33%	33%
bean	bean		4%	4%	3%	0.01	0.01	8%	42%	50%	13%	40%	47%	0%	0%	100%
bhobola														0%	100%	0%
bhondasi														100%	0%	0%
black jack	black jack		17%	9%	22%	0.03	0.06	8%	42%	50%	7%	45%	47%	3%	50%	38%
bupwe			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	0%	0%			
bwerere			0%	1%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%			
cabbage	cabbage		6%	8%	5%	0.01	0.01	5%	91%	5%	0%	92%	8%	0%	60%	40%
carrot	carrot		2%	4%	1%	0.00	0.00	0%	90%	10%	0%	100%	0%			
cassava	cassava		1%	1%	1%	0.00	0.00	0%	25%	75%	0%	100%	0%	0%	100%	0%
chibonji			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%	0%	100%	0%
chigogode														100%	0%	0%
chihleka			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%			
chihlohlani			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	0%	0%	0%	0%	100%

			Freelistings												Food Scarcity		
Food plant	English name	Scientific name	Total number (men + women)	Number of men	Number of women	Sutrop CSI men	Sutrop CSI women	% of men that indicated traffic light:			% of women that indicated traffic light:				% of hh that indicated traffic light:		
								green	amber	red	green	amber	red		green	amber	red
chiriri															0%	50%	50%
chitichi			0%	1%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%		0%	0%	100%
chobve			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	50%	50%				
choumollier			1%	1%	1%	0.00	0.01	50%	50%	0%	100%	0%	0%				
covo			5%	6%	4%	0.01	0.01	11%	83%	6%	17%	78%	6%				
cowpea	cowpea		22%	23%	21%	0.06	0.06	17%	54%	29%	21%	55%	24%		19%	52%	30%
damba			0%	1%	0%	0.01	0.00	0%	50%	50%	0%	100%	0%		0%	0%	100%
danhatsoko			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	100%	0%				
dora			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%				
duwanhuwa			1%	1%	1%	0.00	0.00	0%	67%	33%	0%	0%	100%				
evherine			2%	2%	2%	0.00	0.00	0%	67%	33%	0%	29%	71%				
figtree			0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%				
finger millet	finger millet		2%	3%	1%	0.01	0.01	0%	44%	56%	0%	17%	83%				
fototo			1%	0%	2%	0.00	0.01	0%	0%	0%	0%	86%	14%				
garlic	garlic		0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%				
gayakaya			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%		0%	100%	0%
gezi			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%				
granadilla			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%				
grapes	grapes		0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%				
green pepper	green pepper		0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%				
groundnut	groundnut		12%	16%	10%	0.04	0.02	16%	45%	41%	7%	35%	58%		0%	67%	0%
guava	guava		3%	3%	3%	0.00	0.00	0%	57%	43%	8%	50%	42%		20%	0%	80%
hacha															0%	100%	0%
hakwa	Monkey Orange	Strychnos spinosa	6%	10%	4%	0.02	0.01	11%	78%	11%	11%	74%	16%		10%	90%	0%
hararu			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	0%	0%				
hikong king			1%	1%	1%	0.01	0.01	0%	33%	67%	0%	40%	60%				
howa			1%	0%	1%	0.00	0.00	0%	0%	100%	0%	33%	67%				
humanya			1%	1%	0%	0.00	0.00	0%	25%	50%	0%	0%	100%				

			Freelistings											Food Scarcity		
Food plant	English name	Scientific name	Total number (men + women)	Number of men	Number of women	Sutrop CSI men	Sutrop CSI women	% of men that indicated traffic light:			% of women that indicated traffic light:			% of hh that indicated traffic light:		
								green	amber	red	green	amber	red	green	amber	red
humbamuparara			0%	1%	0%	0.00	0.00	0%	50%	50%	0%	0%	0%			
hute	Waterberry	Syzygium cordatum	5%	6%	3%	0.01	0.01	0%	83%	17%	7%	93%	0%	0%	100%	0%
ibhizha			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
ibhobola			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%	0%	100%	0%
idobi			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
inkobe			1%	1%	1%	0.00	0.01	33%	67%	0%	0%	100%	0%	0%	100%	0%
inopi			0%	0%	0%	0.00	0.00	100%	0%	0%	100%	0%	0%			
ipwa			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
isimoni			1%	1%	1%	0.00	0.01	67%	33%	0%	0%	100%	0%			
kaboora poto			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%			
kahuyu			0%	0%	0%	0.00	0.00	100%	0%	0%	0%	0%	100%			
kanjamu	Mexican turnip	Pachyrhizus erosus	5%	5%	6%	0.01	0.02	0%	29%	71%	0%	40%	60%	0%	50%	50%
kanyu			1%	1%	1%	0.00	0.01	67%	0%	33%	25%	25%	50%	14%	86%	0%
kanzota			1%	0%	2%	0.00	0.01	0%	0%	0%	0%	50%	50%	0%	0%	100%
karuburo			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	50%	50%	0%	100%	0%
katumbatumba			0%	1%	0%	0.00	0.00	0%	100%	0%	0%	0%	0%			
kaura kembudzi			0%	0%	0%	0.00	0.00	0%	0%	0%	50%	50%	0%	0%	100%	0%
kwangwara			0%	0%	0%	0.00	0.00	100%	0%	0%	100%	0%	0%			
leaves and fruits	leaves and fruits		0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
lemon	lemon		2%	2%	1%	0.00	0.00	0%	100%	0%	0%	83%	17%	0%	50%	50%
mabhondasi			1%	1%	1%	0.00	0.00	0%	0%	100%	0%	0%	100%	0%	100%	0%
mabumbe			1%	1%	0%	0.00	0.00	0%	25%	75%	0%	100%	0%			
machichi			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
madaura			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
madzungwa			2%	4%	0%	0.01	0.00	0%	18%	82%	0%	0%	0%			
magaka eminzwa			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
magidhu			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			

			Freelistings												Food Scarcity		
Food plant	English name	Scientific name	Total number (men + women)	Number of men	Number of women	Sutrop CSI men	Sutrop CSI women	% of men that indicated traffic light:			% of women that indicated traffic light:				% of hh that indicated traffic light:		
								green	amber	red	green	amber	red		green	amber	red
magoma			3%	5%	1%	0.01	0.00	0%	36%	64%	0%	60%	40%		0%	40%	60%
maheha			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%				
mahimbi			2%	1%	2%	0.00	0.00	50%	25%	25%	88%	13%	0%		100%	0%	0%
maize	maize		15%	18%	13%	0.06	0.05	8%	73%	20%	7%	70%	23%		0%	40%	60%
majakatya			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%				
majuru			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%				
makiriwani															0%	100%	0%
makudzumburi			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%				
makuyu	Baobab	Adansonia digitata	3%	5%	2%	0.01	0.00	0%	73%	27%	0%	100%	0%		0%	100%	0%
makwangware			1%	0%	1%	0.00	0.00	100%	0%	0%	100%	0%	0%				
mandamarera			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%				
mango	mango		13%	15%	12%	0.02	0.02	57%	43%	0%	66%	30%	4%		93%	3%	3%
manhanga			1%	0%	1%	0.00	0.00	0%	0%	100%	0%	25%	75%		0%	0%	100%
manhuchu															50%	50%	0%
manwiwa			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%				
manyanya	Wild yam	Dioscorea steriscus	20%	23%	18%	0.07	0.05	6%	20%	72%	9%	33%	57%		16%	38%	46%
manzviri	Velvet Wild medlar	Vangueria infausta	3%	4%	3%	0.01	0.01	0%	27%	73%	0%	42%	58%		25%	0%	75%
mapfura	Amarula	Sclerocarya birrea	3%	2%	4%	0.01	0.01	0%	80%	20%	0%	47%	53%				
mapudzi			0%	0%	0%	0.00	0.00	100%	0%	0%	0%	0%	0%				
marihanga			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%				
maroro			2%	4%	1%	0.00	0.00	9%	9%	82%	25%	25%	50%				
maruni			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	50%	50%		0%	0%	100%
masamba sango			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%		0%	0%	100%
masau	Jujube	Ziziphus mauritiana	7%	8%	7%	0.01	0.01	0%	5%	95%	3%	0%	97%		0%	8%	92%
mashamba			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%		0%	33%	67%
mashonja			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%				

			Freelistings												Food Scarcity		
Food plant	English name	Scientific name	Total number (men + women)	Number of men	Number of women	Sutrop CSI men	Sutrop CSI women	% of men that indicated traffic light:			% of women that indicated traffic light:				% of hh that indicated traffic light:		
								green	amber	red	green	amber	red		green	amber	red
mashuku			1%	1%	0%	0.01	0.00	0%	67%	33%	0%	50%	50%		0%	0%	100%
matamba	Monkey Orange	Strychnos spinosa	13%	15%	12%	0.03	0.03	24%	52%	24%	35%	49%	16%		9%	65%	26%
matondo			2%	3%	2%	0.00	0.00	100%	0%	0%	78%	11%	11%		50%	50%	0%
matowe			2%	2%	2%	0.00	0.00	0%	0%	100%	0%	0%	100%		0%	0%	100%
matsungwa			2%	1%	3%	0.00	0.01	25%	50%	25%	38%	46%	15%		50%	25%	25%
matufu	False wild medlar	Annanon senegalensis	11%	11%	11%	0.03	0.02	77%	23%	0%	63%	33%	2%		86%	14%	0%
maturi			1%	0%	1%	0.00	0.00	100%	0%	0%	100%	0%	0%		100%	0%	0%
mauyu	Baobab	Adansonia digitata	10%	12%	8%	0.02	0.02	3%	15%	82%	0%	3%	97%		0%	22%	78%
mavonde			0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%				
mazhanje	Wild Loquat	Uapaca kirkiana	5%	6%	4%	0.01	0.01	29%	12%	59%	26%	0%	74%		14%	0%	86%
mberete			0%	0%	1%	0.00	0.00	0%	0%	0%	33%	33%	33%				
mbumbu			1%	0%	1%	0.00	0.00	100%	0%	0%	67%	0%	33%				
mbumi			2%	4%	1%	0.01	0.00	10%	10%	80%	75%	0%	25%				
melon	melon		0%	0%	0%	0.00	0.00	100%	0%	0%	0%	50%	50%				
mhandamarera			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%		100%	0%	0%
mhesva															0%	0%	100%
mhodzi dzemanhanga															0%	100%	0%
mhunga			1%	2%	0%	0.01	0.00	0%	17%	83%	0%	0%	100%		10%	30%	60%
mhuvuyu			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%				
millet	millet		3%	3%	2%	0.01	0.00	0%	11%	89%	0%	0%	100%		0%	50%	50%
misodzi red			1%	0%	1%	0.00	0.00	0%	100%	0%	0%	100%	0%				
mkhemeswane			0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%				
moringa			0%	0%	1%	0.00	0.00	0%	0%	0%	0%	67%	33%		0%	0%	100%
mowa			4%	3%	6%	0.00	0.01	14%	71%	14%	8%	60%	32%		50%	25%	25%
mowodhongi			1%	0%	1%	0.00	0.00	0%	100%	0%	0%	67%	33%				
muchacha	Amaranthus	Amaranthus spp	4%	4%	4%	0.02	0.01	10%	80%	10%	6%	71%	24%		0%	75%	25%

			Freelistings												Food Scarcity		
Food plant	English name	Scientific name	Total number (men + women)	Number of men	Number of women	Sutrop CSI men	Sutrop CSI women	% of men that indicated traffic light:			% of women that indicated traffic light:			% of hh that indicated traffic light:		
								green	amber	red	green	amber	red	green	amber	red
muferefere	Chicken cucumber	cucumisanguria	6%	8%	6%	0.02	0.01	19%	43%	38%	38%	42%	19%	25%	25%	50%
mufushwa			2%	1%	3%	0.00	0.00	67%	33%	0%	0%	85%	15%	0%	83%	17%
muhape			2%	3%	1%	0.00	0.00	0%	29%	71%	0%	50%	50%			
mukute			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	0%	100%	0%	0%	100%
mukwahle			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%			
munhope			0%	0%	0%	0.00	0.00	0%	100%	0%	100%	0%	0%			
munyemba	Cowpea leaves	Vigna Unguiculata	4%	3%	5%	0.01	0.01	0%	44%	56%	0%	19%	81%	0%	75%	25%
muperera														100%	0%	0%
mupombera			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%			
murudhe			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%			
musau			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%			
mushamba			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
mushinji			1%	0%	1%	0.00	0.00	0%	0%	100%	0%	0%	100%	0%	0%	100%
musodza														0%	100%	0%
musongo			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
muswewebhiza			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	0%	0%			
musweyetsoko			0%	1%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%			
muteka			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
mutohwe			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%			
mutsongwe			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
mutsotso														0%	100%	0%
muzhanje			0%	0%	1%	0.00	0.00	0%	0%	0%	100%	0%	0%			
mwamuzamani			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
n'ando			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%	0%	100%	0%
natal common			0%	1%	0%	0.00	0.00	50%	0%	50%	0%	0%	0%			
ngangaringa			0%	1%	0%	0.00	0.00	0%	50%	50%	0%	100%	0%			
nharara			0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%			
nhazha			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			

			Freelistings												Food Scarcity		
Food plant	English name	Scientific name	Total number (men + women)	Number of men	Number of women	Sutrop CSI men	Sutrop CSI women	% of men that indicated traffic light:			% of women that indicated traffic light:			% of hh that indicated traffic light:		
								green	amber	red	green	amber	red	green	amber	red
nheme	Neem	Azadirachta indica	10%	10%	9%	0.02	0.02	71%	25%	4%	88%	10%	2%	67%	33%	0%
nhengeni	Large sour plum	Ximenia caffra	9%	9%	10%	0.02	0.02	75%	21%	4%	75%	14%	11%	0%	100%	0%
nhenzva			0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%			
nhkongoro			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
nhopotopo			1%	1%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%			
nhunguru	Batoka plum	Flacourtia indica	6%	5%	6%	0.01	0.01	0%	23%	77%	4%	11%	85%	0%	0%	100%
ntsomo			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
nurtjies			2%	2%	2%	0.00	0.00	0%	20%	80%	11%	44%	44%	100%	0%	0%
nyadawa			1%	0%	2%	0.00	0.01	0%	0%	0%	0%	86%	14%			
nyamugogwa			2%	3%	2%	0.01	0.01	57%	43%	0%	43%	57%	0%			
nyando			2%	3%	1%	0.00	0.00	0%	25%	75%	0%	25%	75%	0%	100%	0%
nyapape			1%	1%	1%	0.00	0.01	0%	100%	0%	0%	50%	50%	0%	0%	100%
nyevhe	Cat whiskers/ Spider plant	Cleome Gynandra	29%	26%	31%	0.06	0.08	14%	64%	22%	27%	52%	21%	8%	82%	10%
nyii			3%	3%	3%	0.01	0.01	0%	38%	63%	0%	27%	73%	0%	0%	100%
nzvinda			1%	0%	1%	0.00	0.00	0%	0%	100%	0%	0%	100%			
nzviru			0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%			
okra	okra		25%	19%	28%	0.06	0.09	23%	57%	21%	18%	56%	26%	6%	66%	28%
okra baobab			1%	0%	1%	0.00	0.00	0%	0%	100%	67%	0%	33%	50%	50%	0%
okra kawuyu	Baobab leaves	Adansonia digitata	7%	6%	8%	0.02	0.03	13%	69%	19%	45%	24%	32%	73%	23%	0%
okra mubvapasi			1%	0%	1%	0.00	0.00	0%	0%	0%	0%	50%	50%	25%	75%	0%
okra wild	Okra	Corchorus olitorius	4%	1%	5%	0.00	0.01	0%	75%	25%	8%	38%	54%	14%	57%	29%
onion	onion		7%	8%	6%	0.01	0.01	22%	78%	0%	50%	50%	0%			
orange	orange		5%	6%	4%	0.01	0.01	0%	100%	0%	0%	94%	6%			
paprika	paprika		1%	1%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%			
pawpaw	pawpaw		3%	4%	2%	0.00	0.00	10%	90%	0%	18%	82%	0%	0%	67%	33%
pearl millet	pearl millet		7%	9%	6%	0.03	0.02	8%	71%	21%	8%	85%	8%	0%	20%	80%
peas	peas		1%	0%	1%	0.00	0.00	0%	0%	100%	33%	0%	67%	0%	0%	100%

			Freelistings											Food Scarcity		
Food plant	English name	Scientific name	Total number (men + women)	Number of men	Number of women	Sutrop CSI men	Sutrop CSI women	% of men that indicated traffic light:			% of women that indicated traffic light:			% of hh that indicated traffic light:		
								green	amber	red	green	amber	red	green	amber	red
potato	potato		1%	2%	1%	0.00	0.00	0%	80%	20%	0%	100%	0%			
pumpkin	pumpkin		22%	16%	25%	0.03	0.06	23%	55%	25%	28%	52%	20%	27%	36%	36%
rambanyama			0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%			
rape	rape		8%	10%	7%	0.02	0.01	21%	75%	4%	27%	73%	0%	0%	60%	40%
rapoko			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
renenje			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
rice	rice		0%	0%	0%	0.00	0.00	0%	0%	100%	50%	50%	0%	0%	100%	0%
runisango			1%	0%	1%	0.00	0.00	0%	0%	0%	0%	40%	60%			
rupiza			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%	0%	100%	0%
samp			1%	1%	1%	0.01	0.00	25%	75%	0%	20%	60%	20%	0%	100%	0%
sesame	sesame		0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
shambahuro			0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%			
shangaume			0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%			
shenje	Waterberry	Syzygium cordatum	7%	10%	5%	0.02	0.01	0%	33%	67%	0%	26%	74%	38%	50%	13%
shesheni			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	0%	0%			
shinga			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
shirinje			1%	1%	1%	0.00	0.00	0%	0%	100%	0%	0%	100%	0%	0%	100%
shomhwe														0%	80%	20%
showani			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	100%	0%			
shuma			1%	1%	1%	0.00	0.00	0%	100%	0%	0%	67%	33%	0%	100%	0%
sihani			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%			
songo			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
sorghum	sorghum		19%	23%	16%	0.08	0.06	11%	57%	33%	10%	62%	29%	3%	64%	33%
spinach	spinach		1%	1%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%			
squash	squash		0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%			
sugar loaf	sugar loaf		0%	0%	0%	0.00	0.00	100%	0%	0%	0%	0%	0%			
sugarcane	sugarcane		1%	0%	1%	0.00	0.00	0%	0%	0%	0%	50%	50%	0%	100%	0%
sunflower	sunflower		1%	2%	1%	0.00	0.00	0%	0%	100%	0%	0%	100%			
sweet potato	sweet potato		9%	9%	8%	0.02	0.02	8%	48%	44%	8%	43%	46%	20%	60%	20%

			Freelistings												Food Scarcity		
Food plant	English name	Scientific name	Total number (men + women)	Number of men	Number of women	Sutrop CSI men	Sutrop CSI women	% of men that indicated traffic light:			% of women that indicated traffic light:			% of hh that indicated traffic light:		
								green	amber	red	green	amber	red	green	amber	red
teka			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
tibababa			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
tichechenyi			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
tinyawa			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
tishowani			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
tisvatima			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	0%	100%			
titoma			0%	1%	0%	0.00	0.00	0%	50%	50%	0%	0%	0%			
titsele			0%	0%	0%	0.00	0.00	0%	100%	0%	50%	50%	0%			
tomato	tomato		9%	10%	9%	0.02	0.02	28%	69%	3%	41%	56%	3%			
tsambatsi			1%	3%	0%	0.00	0.00	14%	43%	43%	50%	0%	50%			
tsamvi			1%	2%	0%	0.00	0.00	0%	40%	60%	0%	100%	0%	0%	100%	0%
tsatsa			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	0%	100%			
tsenza			1%	1%	0%	0.00	0.00	0%	0%	100%	0%	0%	100%			
tsine			1%	1%	1%	0.00	0.00	0%	100%	0%	0%	67%	33%			
tsombori			2%	4%	0%	0.01	0.00	0%	20%	80%	0%	0%	100%			
tsongora	Wild grape	Lannea eduli	11%	11%	12%	0.04	0.05	27%	40%	33%	21%	38%	40%	25%	50%	25%
tsubvu	Smelly berry	Vitez mombassae	6%	7%	6%	0.01	0.01	10%	0%	90%	0%	4%	96%	100%	0%	0%
tsunga			1%	1%	1%	0.00	0.00	0%	100%	0%	0%	100%	0%			
tsvanzva			1%	2%	1%	0.00	0.00	40%	20%	40%	20%	40%	40%			
tsvitsvirondo			1%	2%	1%	0.00	0.00	0%	60%	40%	0%	20%	80%	33%	0%	67%
tumbe			0%	0%	0%	0.00	0.00	100%	0%	0%	0%	100%	0%			
uhagezi			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
umcaba			0%	0%	0%	0.00	0.00	100%	0%	0%	0%	100%	0%			
umkhemeswane			1%	0%	1%	0.00	0.00	0%	100%	0%	67%	33%	0%	0%	100%	0%
umpholokoqo			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	0%	100%			
umtshubi			0%	0%	0%	0.00	0.00	0%	0%	100%	0%	0%	0%			
umviyo			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	100%	0%	0%	100%	0%
umxanxa														0%	100%	0%

			Freelistings												Food Scarcity		
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								green	amber	red	green	amber	red	green	amber	red
usika														0%	100%	0%
vegetables	vegetables		2%	3%	2%	0.01	0.01	22%	56%	22%	33%	44%	22%	14%	71%	14%
watermelon	watermelon		2%	2%	2%	0.00	0.00	60%	40%	0%	57%	14%	29%	100%	0%	0%
wild fruits	wild fruits		0%	0%	0%	0.00	0.00	0%	0%	0%	100%	0%	0%			
xakuxaku			0%	0%	0%	0.00	0.00	0%	0%	0%	0%	100%	0%			
zadzangoro			0%	0%	0%	0.00	0.00	0%	100%	0%	0%	0%	0%			

-The table presents the results of the 'free listing' module, and the 'plants in food scarcity' module of the baseline analysis; In total, 277 men and 448 women out of 522 participating households, responded to the 'free listing' module and listed 161 (men) and 206 (women) species; Regarding the 'plants in food scarcity' module, out of the 522 households, 63 were missing and 438 did actually participate and listed a total of 114 species; Sutrop CSI reflects the knowledge of a specific plant (the higher the CSI, the more representative is the plant of the knowledge shared by community members); Color visualization: Green= used in affluent period, Amber= used in moderate food scarcity period, Red= used during severe food scarcity period.