

National Food and Nutrition Security Survey

LIMPOPO PROVINCE REPORT



National Food and Nutrition Security Survey Limpopo Report

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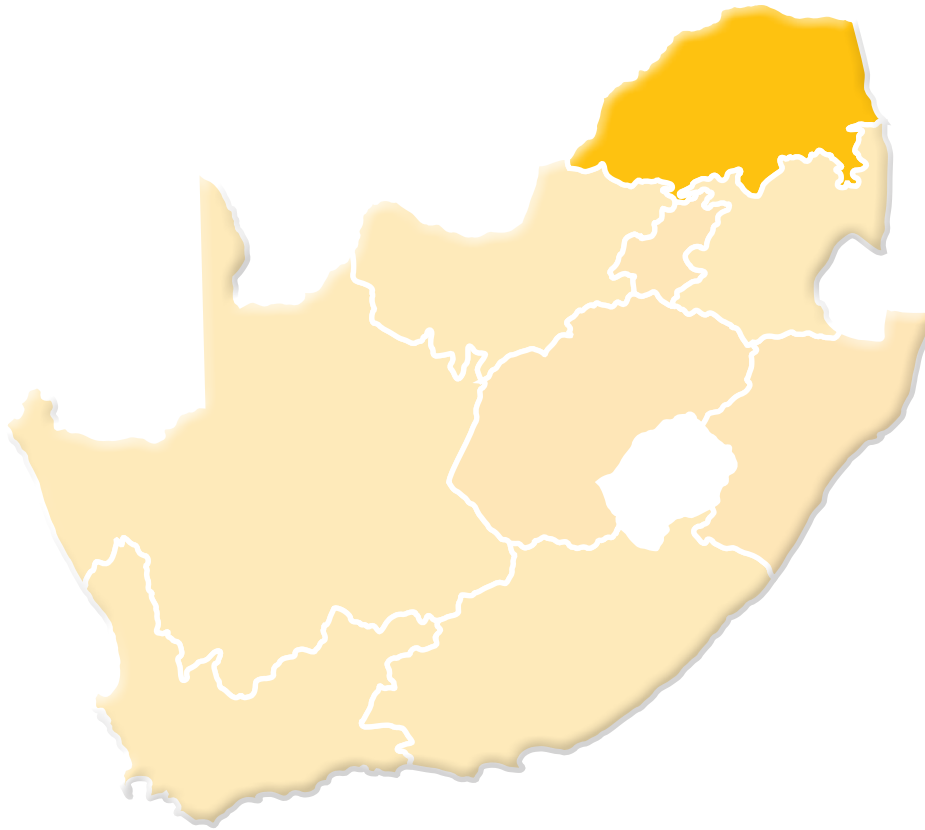
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List of Abbreviations

BMI	Body Mass Index
CAPI	Computer Assisted Personal Interviewing
CI	Confidence Interval
CSI	Coping Strategy Index
GBV	Gender-Based Violence
GDP	Gross Domestic Product
DAFF	Department of Agriculture, Forestry and Fisheries
DALRRD	Department of Agriculture, Land Reform and Rural Development
DDS	Dietary Diversity Score
DOH	Department of Health
DSD	Department of Social Development
FCS	Food Consumption Score
FGDs	Focus Group Discussions
FNS	Food and Nutrition Security
GAM	Global Acute Malnutrition
GHS	General Household Survey
HDDS	Household Dietary Diversity Score
HEA	Household Economy Approach
HFIAP	Household Food Insecurity Access Prevalence
HFIAS	Household Food Insecurity Access Scale
HHS	Household Hunger Scale
HSRC	Human Sciences Research Council
IFSNP	Integrated Food Security and Nutrition Programme
JMP	Joint Monitoring Programme
Kg/Ha	Kilogram Per Hectare
LHZ	Livelihood Zones
MAHFP	Months of Adequate Household Food Provisioning
NFERP	National Food Emergency Relief Programme
NFNSS	National Food and Nutrition Security Survey
NIDS	National Income Dynamic Survey
NISIS	Nation Integrated Social Information System
RDP	Reconstruction and Development Programme
RVAA	Regional Vulnerability Assessment and Analysis
SADC	Southern African Development Community

SAL	Small Area Layers
SAS	Statistical Analyses Systems
SALDRU	Southern Africa Labour Development Research Unit
SANHANES	South African National Health and Nutrition Examination Survey
SAVAC	South Africa Vulnerability Assessment Committee
SOP	Standard Operation Procedure
Stats SA	Statistics South Africa
TLU	Tropical Livestock Units
UNICEF	United Nations International Children's Emergency Fund
VIP	Ventilated Improved Pit
WASH	Water, Sanitation and Hygiene
WFP	World Food Programme
WHO	World Health Organization
WHR	Waist-to-Hip Ratio
ZALOC	Lowveld Open Access Cattle and other Income
ZALOF	North Eastern Limpopo Open Access Farming
ZALOI	Lowveld Open Access Irrigated Cropping Livelihood Zone
ZANOC	Northern Open Access Cattle and Dryland Crops Livelihood Zone



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Disclaimer

This report is based on the empirical evidence collected from selected Small Area Layers (SALs) within the five districts of the Limpopo Province. SAL is the smallest geographical unit usually allocated to a single enumerator during census enumeration. In other words, it constitutes a small piece of land for an enumerator to cover to administer a questionnaire during a census or study (Statistics South Africa). Each of the SALs in this survey had 20 visiting points (households). The results were intended to provide a baseline assessment of the status quo of food and nutrition security in the province. However the data was collected within the first three weeks of the COVID-19 lockdown. This greatly influenced and changed the picture from what would ordinarily obtain under a normal situation. Results presented thus should be interpreted with caution. Whilst this research project has benefited from the valuable insights and input of a Technical Advisory Group (TAG) that provided comments and reviewed the final research report, the ultimate responsibility for the contents therein (including but not limited to unintentional errors, inaccuracies, or omissions) rests with the authors and researchers involved. Users of this research should exercise their judgment and discretion when interpreting the findings and recommendations presented herein.

Executive Summary

Food and nutrition security is one of the fundamental strategic imperatives of the government of South Africa. The right to access sufficient food is firmly entrenched in the Constitution of the Republic of South Africa (Sections 27, 28, and 35). Many policies, programmes, and intervention measures such as social grant systems (which include child support, school feeding schemes, farmer support programmes) have been developed and implemented to help improve the food and nutrition security situation at household level in the country. These programmes are reflected in the National Policy on Food and Nutrition Security in 2014 and, subsequently, the National Food and Nutrition Security Policy Implementation Plan (2018-2023). Despite these efforts, food insecurity is still a reality and a major concern for several millions of people in South Africa. Strong evidence exists that there are households in South Africa that go to bed on empty stomachs, and others that only eat once or twice a day. In addition, South Africa is reported to be going through a nutrition transition characterised by the double burden of malnutrition (manifesting through stunting and wasting) and overweight due to the consumption of a nutrient poor diet. This is in sharp contrast to the fact that South Africa is food secure at a national level. The concentration and distribution of these households across the various districts within the province need to be established as this has been a cause for concern for the Department of Agriculture, Land Reform, and Rural Development (DALRRD) as well as the membership of the South African Vulnerability Assessment Committee (SAVAC) which is comprised of various sectors.

To develop intervention measures that are well targeted and address the root causes of household food and nutrition insecurity, current data at lower geographic levels and contextually relevant scientific evidence are crucial. Accordingly, the DALRRD commissioned a National Food and Nutrition Security Survey (NFNSS) aimed at providing baseline data on the state of food and nutrition security across districts and livelihood zones in South Africa. Further, the survey sought to investigate the link between food security and nutrition as well as assessing the impacts of COVID-19 on household FNS. National surveys on food and nutrition security are needed as they inform the government and policymakers about the actual status of food and nutrition insecurity in a country.

This provincial report provides the first ever full-scale baseline assessment of the Food and Nutrition Security Survey (NFNSS) conducted in all five districts of the Limpopo Province. The survey adopted the SAVAC-endorsed methodological framework for measuring food insecurity and assessing vulnerability. The framework combines qualitative and quantitative research dimensions to enhance methodological and data triangulation. Broadly, the framework adopts the food and nutrition security continuum, and the Household Economy Approach (HEA).

Out of the targeted 2 380 visiting points (VPs), 98.7% were valid. Out of these valid VPs, 85.8% were realised. A total of 2 043 people were interviewed in this province and when weighted, this total represents 3 321 928 South Africans 18 years and older living in Limpopo Province.

Several internationally accepted food security indicators, such as the Household Food Insecurity Access Score (HFIAS), Household Hunger Score (HHS), Food Consumption Score (FCS), and Household Dietary Diversity Score (DDS), were used to capture the different dimensions of food and nutrition security. The results indicated that many households were food insecure in the Limpopo Province. The HFIAS revealed that less than half (41.2%) of households were food secure, with the remaining 58.8% of the household's being food insecure. Of those who are food insecure, 10.5% of the households experienced severe levels of food insecurity. The HHS showed that 85% of households experienced little to no hunger, while 12.0% and 4.0% of households experienced moderate hunger and severe hunger, respectively. The FCS and HDDS showed that 38.0% and 83.4%, respectively, consumed an acceptable number of food groups across all the districts.

The FCS indicated that 35.9% of households consumed poor diets, while 26.1% consumed borderline diets. However, the households mostly consumed nutrient-poor food groups such as cereals, condiments, sugars, oils/fats; there was limited consumption of nutrient-rich food groups such as fruits, pulses, nuts, eggs, fish, and seafood.

The levels of food insecurity varied much across districts. Severe food insecurity was more prevalent in Waterberg District where 18% of the households were severely food insecure and above 9% experienced severe hunger as determined by HFIAS and HHS, respectively. Additionally, households from Waterberg District had poor diet (41%) and lowest dietary diversity (4%). Other districts, namely Mopani, Sekhukhune, and Capricorn ranged between 11% and 8%, while Vhembe District had the lowest proportion of households experiencing severe food insecurity (6%). Severe food insecurity was more prevalent among households headed by adults aged 45-60 years, and Waterberg District had the highest proportion in the severe food insecurity category.

Significant relationships were found between household food security status and some demographics and socio-economic factors such as gender, age of household heads/ acting head, access to irrigation, improved water source, sanitation, social grants, household size, markets, education level of household head/ acting head, and involvement in agricultural production. Overall, the results showed that social grants, education levels, and employment were positively correlated with better food security outcomes. As an example, the proportion of food-secure households increased significantly as education levels also increased; only 6.5% of households headed by people with no education were food secure, compared to 20.5% of households headed by people with tertiary qualifications. Farming activities played a significant role in food security, suggesting that dealing with food insecurity in rural province of Limpopo is dependent not only on the expansion of social protection measures (such as social grants) and creating employment opportunities, but promotion of household food production with the needed incentives.

Findings indicate that 83.5% of children under 2 years were breastfed at some point in their lives. The provincial prevalence of overall stunting, wasting, and underweight in children aged 0-5 years is 18.3%, 7.7%, and 11.5%, respectively, compared to 24.5%, 5.8% and 5.8% in 2012. These results indicate that the proportion of children experiencing acute undernutrition has increased slightly, while the prevalence of chronic undernutrition has reduced over the past 10 years. Over the same time period, the combined prevalence of overweight and obesity in both adult females and males have increased over the past 10 years from 56.6% to 62.0% and 27.8% to 34.2%, respectively. Across the districts, Waterberg has the highest prevalence of severe stunting (17.3%), while Mopani has the highest prevalence of severe wasting (10%) and severe underweight (13%). The nutrition indicators for children were generally not correlated with the food security status of households, suggesting that these nutrition challenges similarly affected members of both food secure and food insecure households. However, there were significant correlations between food security and nutrition indicators for adults. Table A shows the summary of food security and nutrition indicators.

The survey also showed that the COVID-19 pandemic, and the lockdown measures introduced to curb its spread, led to serious disruptions of food supply chains and production systems. The increase in food prices was the biggest shock experienced across all five districts of Limpopo Province. The highest shocks were experienced in Waterberg and Sekhukhune districts with 39%, and 38%, respectively. Sekhukhune District had the highest percentage (34.9%) of households who were sometimes worried about their food running out before they can get money to buy some more food. Waterberg and Mopani districts also had the highest percentage (29.7% and 27.6%, respectively) of households who reported that their food often runs out and they did not have money to buy more.

Several recommendations have been proposed, and these revolve around strategies to:

- increase incomes of households,
- create employment,
- ensure water security to adapt to the changing climate,
- enhance food safety,
- invest in post-harvest agro-processing and intrinsic land access,
- establish food banks,
- promote domestic food production,

- improve awareness of micro- and macro-nutrient consumption interventions, and
- implement full-scale nutrition-sensitive programmes.

Table A: Limpopo Food and Nutrition Security Situation based on selected Indicators

DISTRICTS	FOOD SECURITY INDICATORS (%)											
	Household Food Insecurity Access Scale (HFIAS)			Household Hunger Scale (HHS)			Household Dietary Diversity Score (HDDS)			Food Consumption Score (FCS)		
	Food Secure	Mild/ Moderate	Severe	Little/No	Moderate	Severe	Highest	Medium	Lowest	Acceptable	Borderline	Poor
Capricorn	43.0	49.0	8.0	86.0	13.0	2.0	81.0	15.0	4.0	43.0	22.0	35.0
Sekhukhune	54.0	38.0	9.0	89.0	9.0	2.0	87.0	10.0	3.0	41.0	23.0	36.0
Mopani	31.0	57.0	11.0	81.0	15.0	4.0	79.0	18.0	4.0	36.0	27.0	37.0
Vhembe	37.0	57.0	6.0	90.0	9.0	2.0	87.0	11.0	2.0	41.0	29.0	30.0
Waterberg	31.0	51.0	18.0	75.0	16.0	9.0	80.0	16.0	4.0	30.0	29.0	41.0
Province	41.2	48.3	10.5	85.0	12.0	4.0	83.4	13.3	3.3	38.0	26.1	35.9

DISTRICTS	NUTRITION INDICATORS (%)											
	STUNTING			WASTING			UNDERWEIGHT			BMI		
	All	Moderate	Severe	All	Moderate	Severe	All	Moderate	Severe	Underweight	Overweight	Obese
Capricorn	5.8	3.7	2.1	2.6	2.6	0.0	6.8	5.0	1.8	9.6	18.2	34.5
Greater Sekhukhune	24.6	15.3	9.4	3.1	0.7	2.4	8.1	5.7	2.4	11.3	15.9	38.5
Mopani	18.5	6.7	11.8	13.3	3.2	10.0	16.6	3.6	13.0	10.1	22.9	31.7
Vhembe	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.1	21.3	34.9
Waterberg	28.0	10.7	17.3	11.1	8.2	2.9	11.6	5.0	6.6	9.8	21.7	33.3
Province	18.3	8.4	10.0	7.7	3.5	4.3	11.5	5.2	6.3	9.4	19.8	34.8

Legend

Food Secure,			0.0 - 9.9%
Little/ No Hunger,	Severe/	Mild/	10.0 - 19.9%
Highest,	Poor	Moderate/	20.0 - 29.9%
Acceptable		Borderline	30.0 - 39.9%
			40.0 - 49.9%
			50.0% +

Food security which is widely defined as ‘a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life’ (FAO, 1996), is one of the strategic imperatives for South Africa. This is expressed in the Constitution, government policy documents, and development plans (e.g., the National Development Plan). The right to have access to sufficient food by all citizens is enshrined in the Constitution of the country. To translate this right into action, the government approved the National Policy on Food and Nutrition Security in 2014. Since then, the National Food Security plan has been developed but not fully implemented. However, despite solid legislative, constitutional, and policy framework for food and nutrition security imperatives, a significant proportion of South Africa’s population faces massive food and nutrition challenges. These challenges include hunger, micronutrient deficiencies, stunting, wasting and obesity. While there is sufficient food to feed everyone in South Africa through domestic food production and food imports, many families and individuals go to bed hungry (Stats SA, 2019). Recent estimates are that the number of individuals with inadequate or severely inadequate access to food rose from 13.7 million in 2020 to 14.4 million in 2021 (StatsSA, 2021).

Food security is a multi-dimensional concept¹, which needs to be addressed within the context of various issues in South Africa. These include land reform, employment, agricultural productivity, adequate responses to hazards and shocks, as well as the economic aspects of food security. This requires planning that is adequate, efficient, and effective in addressing the country’s vulnerability to food insecurity. Such planning needs to be supported by up-to-date data at lower geographic levels and scientific evidence that is contextually relevant to the realities facing various communities and households in the country. Large-scale surveys, such as the NFSS, can generate such data and evidence, that is representative at the district levels. The NFSS survey intends to address the following objectives:

1. To provide a baseline assessment of the food and nutrition security situation at household level in the respective livelihood zones in Limpopo Province, in terms of:
 - a. Availability: to determine food availability at household level.
 - b. Access: to determine food access at household level.
 - c. Food utilisation: to determine individual food consumption within the household and compile anthropometric measurements.
 - d. Food stabilisation: to assess household food stability with respect to the food supply, price changes, shocks, and coping mechanisms.
2. To analyse the link between food security and nutrition and explore reasons for people’s vulnerability.
3. To assess the impact of COVID-19 on food security and nutrition at household level in South Africa.
4. To make recommendations for planning and targeting of interventions for food and nutrition security.

¹ The four dimensions of food security that are commonly identified are food availability, food access, food utilisation, and stability. These dimensions are hierarchical, with availability necessary but not sufficient to ensure access, while access is, in turn, necessary but not sufficient for effective utilisation (Barrett, 2010).

The state of food and nutrition vulnerability in South Africa has been exacerbated by both the economic hardships, which are a result of the high rate of unemployment, and the outbreak of COVID 19 with the associated control measures implemented by the government to contain its spread. As an intervention, the Department of Agriculture Land Reform and Rural Development (DALRRD) has in the past developed and implemented various programmes that are intended to cushion communities from the vulnerability and devastating effects of hunger and poverty. There is, therefore, a need to systematically determine if these government programmes and interventions are having the desired impact of protecting households from exposure to food insecurity. To do this, the DALRRD commissioned a nationwide food security and nutrition survey. The survey sought to develop a deeper understanding of the state of food security and hunger at household level. Its ultimate objective is to develop targeted programmes and intervention measures that address prevalent problems and is, therefore, likely to yield impactful results.

The DALRRD provides the secretariat for, and chairs, the South African Vulnerability Assessment Committee (SAVAC). The committee exists as a multi-stakeholder forum for organising the development and maintenance of a well-coordinated information system for classifying, measuring, monitoring, and forecasting food insecurity and vulnerability levels in the country. Not long ago, SAVAC began a process of conducting baseline assessments to determine the *status quo* of livelihoods, food, and nutrition security in localised geographical areas for informed planning and targeting of interventions. The initial baseline assessments were conducted in 19 of the 119 Livelihood Zones of South Africa (Ngidi et al., 2016). However, for the information system to be fully functional, there was a realisation of the need to undertake a national baseline against which the national vulnerability forecasts and monitoring surveys can be conducted.

In this regard, SAVAC endorsed the need for a national food, nutrition, and security assessment that would enable the country to have a complete baseline data set of open access zones, exclusive access, and urban areas to provide a complete picture of the food and nutrition security situation at municipal, district and provincial levels. Such a national baseline is meant to guide planning, including the design of intervention strategies for the National Food and Nutrition Security Plan (NFNSP).

The national report will provide the first-ever full-scale baseline assessment of the National Food and Nutrition Security Survey (NFNSS) conducted in all the districts across the nine provinces of South Africa. This report contains the results from the Limpopo Province only. The survey seeks to provide the first step towards the development of a multi-dimensional index to assess countries' vulnerability to food insecurity across all the four food security dimensions. It supplements the South Africa Demographic and Health Survey (SADHS) by updating the provincial level data that it presented. A notable deviation of this report from the General Household Surveys (GHS) covering approximately 32 000 households annually since 2002, and it does not include nutrition indicators. It only focuses on the experience of hunger and access to food only. In most countries, food and nutritional security assessments provide estimates which are representative at administrative levels or areas (i.e., province, districts and sub-districts) by rural/ urban divide, or for both rural and urban as defined by the livelihood zones.

The survey adopted the SAVAC endorsed methodological framework for measuring food insecurity and vulnerability. The framework combines qualitative and quantitative research dimensions to enhance methodological and data triangulation. Broadly, the framework adopts the food security continuum and the Household Economy Approach (HEA).

3.1 Food Security Continuum

The food security continuum builds on the iterative understanding of food insecurity as a phenomenon. It brings convergence to the economic, social, environmental, and political aspects of food insecurity and, by focusing on both household and individual experience on food security. Figure 1 provides an overview of the food security continuum.

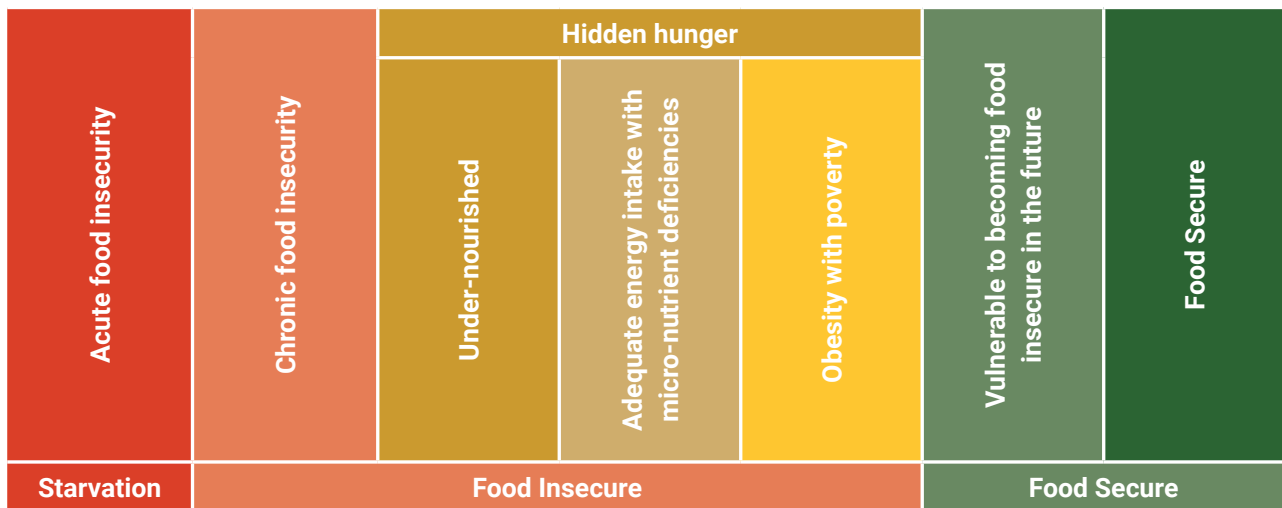


Figure 1: Food Security Continuum (Hendriks, 2016)

A set of indicators to monitor food security and nutrition were considered, including HFIAS, HHS, DDS, and anthropometric measurements to determine the number of households that are food insecure and using various categorisations in the Food Security Continuum.

3.2 Indicators of Food and Nutrition Security Measurement

The household food and nutrition security (FNS) levels were measured using different indicators. The multi-dimensional nature of FNS makes it difficult to adequately capture all its dimensions using only one indicator. There is currently no perfect single indicator of FNS and, instead, several complementary indicators - each focusing on one or more of the four dimensions of FNS (i.e., availability, access, utilization or nutrition, and stability) - exist (Hendriks et al., 2016). The food availability dimension refers to the availability of sufficient quantities of food of appropriate quality, supplied through domestic production, imports or donations. This report focuses on food production activities. Food access is about households or individuals having adequate resources to acquire, in a socially acceptable manner, appropriate foods for a nutritious diet. The food utilisation pillar relates to the ability of households to select, store, prepare, distribute, and eat food in ways that ensure adequate nutritional absorption for all members of a household. This dimension, therefore, focuses on how households use the food through adequate diets, clean water, sanitation, and health care to

reach a state of nutritional well-being where all members' physiological needs are met. The food stability pillar points to the fact that to be food secure, a population, household, or individual must have access to adequate food at all times. They should not risk losing access to food due to sudden shocks (e.g., an economic or climatic crisis) or cyclical events. Studies that have investigated the correlations among the different FNS indicators in South Africa and internationally have found that correlations among different FNS indicators vary from relatively weak across FNS dimensions (those are comparing indicators of the different FNS dimensions), to relatively strong within FNS dimensions (comparing indicators of the same dimension). It is, thus, important that a suite of FNS indicators be reported to adequately monitor the different dimensions of FNS. In acknowledging that there is no single perfect agreed global measure that captures all aspects of food insecurity, the framework proposed the use of standard and acceptable food and nutrition measurement indicators. Through the food security continuum, an array of indicator tools was used, and these were complemented with the HEA, as indicated in Table 1.

Table 1: Tools that were used for both quantitative and qualitative methods

	Baseline Assessment Indicators	Tools	Instrument: Section	
Food Security Continuum	Availability	<ul style="list-style-type: none"> • Production • Post-Harvest 	6	Household Economic Approach
	Access	<ul style="list-style-type: none"> • Hunger Scale (12months) • Hunger Scale (4Weeks) • HFIAS 	7 A, B, C, D 9	
	Stability	<ul style="list-style-type: none"> • Food expenditure • Key Informant Interviews • Shocks 	8, 11, 12	
	Utilisation	<ul style="list-style-type: none"> • HDD • Anthropometry Measurements 	Individual Nutrition Questionnaire	

**HEA: 1) Food Security Livelihood Zoning 2) Wealth Breakdowns 3) Livelihood Strategies 4) Problem Specification 5) Analysis of Coping Strategies 6) Projected Outcomes.

3.3 Household Economy Approach

The second approach has been the livelihoods-based vulnerability assessment system referred to as the Household Economy Approach (HEA), commonly used in many Southern African Developing Community (SADC) countries. This approach provides an understanding of how people make a living (livelihood systems), a forecast analysis for food security and livelihood outcomes in the context of a dynamic environment, is necessary for planning and targeting of interventions. Data captured in this approach is based on the use of rapid appraisal methods and semi-structured interviews to determine wealth breakdown and livelihood strategies in different areas. This is a qualitative dimension of the food security and nutrition assessment in which key informant interviews and focus group discussions were used in different livelihood zones.

4.1 Study Design and Sampling for the Household Survey

The study design was cross-sectional and sought to provide representative and precise information at the household level. The first stage of the two-stage cluster sampling design is the selection of SALs or clusters in each district using PPS (Probability Proportional to Size). In this province, we selected a total of 119 SALs. The second stage was a simple random selection of households within each selected SAL/Cluster, and for this study, we selected 20 households per SAL. Then in each household, we selected an average of 3 persons (household head, mother/caregiver, and child under 5 years old).

As for the HEA, qualitative information was gathered in the form of focus group discussions and key informant interviews in the selected open-access livelihood zones of Limpopo Province. A livelihood zone is an area within which people broadly share the same pattern of livelihood, including options for obtaining food and income and market opportunities.

4.2 Determination of the geographical area (strata) for household sample design

Often, food security and nutrition indicators per geographical area, for example, a district, is used as a basis for drawing the sample for the study. However, food and nutrition insecurity may vary across the country, given the heterogeneity across the livelihood zones (LHZ).

Administratively, Limpopo Province is divided into 5 districts (5 district municipalities), and 25 local municipalities (mixed urban and rural). In this study, the smallest geographic unit is the small area layer (SAL) composed of the 20 households sampled. Given the heterogeneity in livelihoods within regions, the province has 5 Open Access livelihood zones that have people living in them. The LHZ strata can cover several districts or cross over several provinces. This means a district will not necessarily have all the livelihood zones. A GIS function was used to overlay the administrative boundaries with the livelihood zones (as illustrated in Figure 2).

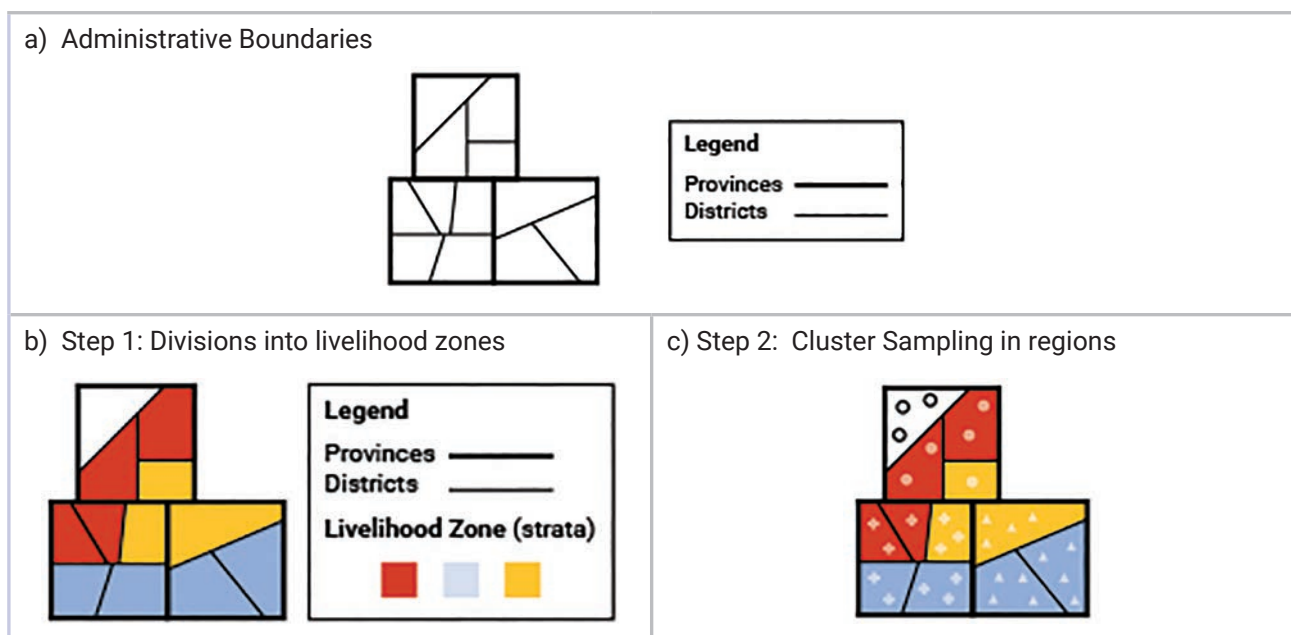


Figure 2: Schematic representation of the overlay of administrative boundaries and LHZ

Stratification by administrative boundary and livelihood zones serves two functions:

- i. First, administrative boundaries rarely correspond with household characteristics related to food insecurity; thus, estimates for administrative aggregations are likely to mask meaningful differences between sub-groups.
- ii. Second, defining sub-groups for stratification using criteria related to vulnerability or food insecurity improves the precision of both sub-group and overall food security estimates.

For district level estimates, the strata of investigation are the 5 districts, with clusters/ SALs distributed across livelihood zones within districts. In this study, given the resource and time constraints, the focus was on the district strata.

4.3 Eligibility

4.3.1 Participant inclusion criteria

- Randomly selected households within the defined geographic area of survey coverage.
- All children under 5 years of age at the time of data collection who live in selected households were eligible for the survey, on condition that their parents or caregivers gave consent for participation. Parents or caregivers provided individual dietary information related to the child, and children participated in anthropometry measurements.
- Mothers/ primary caregivers of the children in the household were eligible if they were included in the survey sample and gave consent for data collection.

4.3.2 Participant exclusion criteria

- Households not currently living in the defined geographic area, or consent for participation is denied by the adult household member approached by the survey team.
- Individuals in selected households were ineligible if consent for individual participation was denied.
- Children were ineligible for anthropometric measurement if they had a disability which prevents accurate weight or height measurements from being taken.
- Children above 5 years of age.
- Adults who are not the head of the household or those who are not responsible for food preparation or not the primary caregiver / biological mother of the children aged under 5 years.

4.4 Sample size estimation

The sample size estimate was aimed at informing the surveillance purpose of tracking important changes in the food and nutritional security in South Africa over time; that is, between rounds of food and nutritional security. In addition, this sample was not meant to produce precise estimates of malnutrition prevalence at district level. The primary goal of collecting the nutrition data and/or anthropometric measures data was to assess the levels of food security and nutrition, and analyse the link between food security and nutrition. The sample design was based on the estimated prevalence of food security outcome indicators described in Section 3.2. This was deemed sufficient to calculate the minimum sample size that allow the link between children's nutritional status and household level of food security.

In order to enhance precision in the estimation of the main outcome indicators, the Standardised Monitoring and Assessment of Relief and Transitions (SMART) methodology was adopted. Essentially, the sample size considered both nutrition and food security indicators through a stepwise process.

Two different samples, based on both food and nutritional security indicators, were calculated, using the following criterion:

- If there was a small difference in the nutrition sample size and food security derived sample sizes, the higher sample size was taken, and both food security and nutrition indicators were assessed in all sampled households.

To ensure that the appropriate sample size is covered, extra clusters per strata were added to substitute inaccessible areas, insecurity, or rejection of some original clusters. Likewise, households within each cluster were reserved to compensate for nonresponse or refusal. The inaccessible areas were replaced by the cluster with the same characteristics. This approach was adopted to ensure unbiased selection and to maintain the precision of the study outcomes.

4.4.1 Determining sample size for the food security survey

The sample size calculation sought to provide statistically representative and precise information on food security at the district level. The required sample size for each stratum (district) was determined using the formula presented below and food security indicators provided in Table 2, and recommended parameters listed in Appendix 5. Due to many different indicators that could be used to measure food security, a proportion of 50% to get the largest sample desired for analysis of multiple indicators of food security at district level was considered.

$$n = \frac{Z^2 p(1-p)}{E^2 \cdot Deff}$$

- 95% degree of confidence (Z Score=1.96);
- P is the prevalence of food insecurity measures for each province; if missing, we assume a P of 50%, which will yield the required sample size which is desired for analysis of multiple indicators of food security at varying prevalence (p);
- Deff: A design effect of 1.5 to adequately address effects of intra-cluster correlation.
- 7-10% minimum desired precision (MOE) or maximum tolerable error (from other studies in sub-Saharan Africa and budgetary constraints on sample size);
- 80% statistical power;
- Household response rate (SANHANES) 2013 varies across provinces.

Table 2: Food Security Indicators

Parameters for food security	Value	Value	Value
Estimated Prevalence of food insecurity (%)	50%	50%	50%
± Desired precision	5%	6.5%	7%
Design Effect (if applicable)	1.5	1.5	1.5
% Non-response Households	15%	15%	15%
% Confidence interval	95%	95%	95%
% Power	80%	80%	80%
Households per district (strata)	678	401	346
Total sample	35 256	20 852	17 992

A sample of 401 households per stratum (district), provide the required estimate of food insecurity of 50% (SANAHNAES 2013), with a 6.5% precision around the estimate assuming a 15% household non-response rate, and a design effect of 1.5 with 95% confidence level and 80% power. This was for the Limpopo Province, with an average of 480 households per district (Table 2). A lower precision e.g., 7%, recommended for lower geographies yielded 346 households per region. The 6.5 % precision was informed by budgetary constraints on sample size and the fact that the recommended precision range between 2-10% for higher geographies (e.g. province, district) and at least 20% for lower geographies (livelihoods).

4.4.2 Determining sample size for nutritional indicators survey

The sampling did not aim at providing an estimate of malnutrition in lower geographies. The goal was to establish the link between food security and nutrition. It was estimated that a sample of 106 children under five for each stratum (district) and converted into 366 households provides the required estimate of stunting of 21.5% (SANAHAES, 2013), with a 10% precision around the estimate assuming a 21% non-response rate, and a design effect of 1.5 with 95% confidence level and 80% power. (See the formula in Box 1 and parameters in Appendix 5 & 6.) The 10% precision was informed by budgetary constraints on sample size, and the fact that we were only interested in linkages between malnutrition and food security in the households. However, the malnutrition prevalence was relatively precise at national and provincial levels. The recommended precision ranged between 2-10% for higher geographies (e.g., province) and between 10-20% for lower geographies (municipalities).

Table 3: Parameters for nutritional indicators

Parameters for Anthropometry	Value*	Value
Estimated Prevalence of stunting (%)	21.5%	21.5%
± Desired precision (MOE)	9%	10%
Power	80%	80%
Confidence Interval	95%	95%
Design Effect (if applicable)	1.5	1.5
Children to be included	131	106
Average HH Size	3.7	3.7
% Children under-5	11%	11%
% Non-response Households	21%	21 %
Households to be included	452	366
Strata (Districts)	52	52
Total households for the study		
*SANHANES (Shisana et.al 2013) Appendix Table 1		

This survey was conducted in 119 SALs, across 5 districts in the province. Within each SAL, we identified a random sample of 20 visiting points. One household was to be selected at each visiting point. This yielded a total sample size of 2 380 households. Once a household was selected, specific household members were eligible to participate in the survey (as per the set inclusion and exclusion criteria set, refer to Section 4.3). These include the head of the household and/ or the person responsible for food procurement and food preparation, as well as the biological mother of any children under the age of 5 years and all children between the ages of 0-5 years. It was estimated that, on average, each household would yield 3 people. The total sample was thus 2 380. The survey managed to get 359 children in the province.

4.4.3 Sampling procedure: selecting clusters

The representativeness of the sample also depends on the sample structure, including the selection of clusters and households within clusters. Clusters or SALs within districts were selected using PPS (Probability Proportional to Size) which measures the size of households in each SAL. To ensure results could be reported at district or livelihood zones, the SALs were distributed across the livelihood zones within each district.

The study adopted the World Food Program (WFP) Technical Guideline, which defines a cluster based on SALs, cluster size, or the number of households survey teams can visit safely in one day and the number of clusters, with a number of households in each for each indicator. Usually, 20 to 30 clusters/EAs per stratum are typical for most settings (Technical Guideline, WFP). In Limpopo Province, 20 households per cluster or (SAL) were thus used.

4.4.3.1 Household response rate

Out of the targeted 2 380 visiting points (VPs), 99% were valid. Out of these valid VPs, 86% of them (2 043) were realised or successfully interviewed, while the refusals accounted for 2%. Absent or 'other' constituted 12%. 'Other' included those who were not eligible to participate, such as those who were living with disabilities, and those who were under-age. Vhembe recorded the highest realisation with rate of 92%, while Waterberg accounted for the least percentage with 76% (Table 4).

Table 4: Household response rate by district

District	Total VPs	Valid VPs		Interviewed		Refused		Absent/Other	
	n	n	%	n	%	n	%	n	%
Capricorn	480	470	97.9	382	79.6	22	4.7	76	15.8
Vhembe	460	457	99.3	425	92.4	12	2.6	23	5.0
Mopani	480	476	99.2	434	90.4	6	1.3	40	8.4
Sekhukhune	480	474	98.8	439	91.5	3	0.6	38	8.0
Waterberg	480	472	98.3	363	75.6	7	1.5	110	22.9
Total	2380	2349	98.7	2043	85.8	50	2.1	287	12.1

4.4.3.2 Delimitation of the Household Economic Approach (HEA)

Three open-access livelihood zones were selected for the qualitative analysis of the study. These zones lie across all districts in the province. These livelihoods are open access, and most households are involved in farming and use other sources of income such as casual labour, small business, grants, and salaried employment to complement their livelihood needs. Ten communities / villages were selected from each livelihood zone, and thirty-six focus group discussions were conducted in each livelihood zone. The discussions were based on determinants of wealth as stipulated by the key informants.

4.5 Field Data Collection

Data collection process in the field was preceded by training which followed an operational manual for field staff. The manual encapsulated processes and steps for household survey data collection, together with the HEA data collection in the selected livelihood zones. The primary purpose of the training was to outline the standard procedure for the fieldwork to ensure consistency and systematic enquiry across the data collection activities. In doing so, the protocol ensure that the fieldwork was consistent and rigorous and that it upholds the highest degree of ethical standards. Some of the broad undertakings enshrined in the training included the Standard Operational Guideline for data collection in the COVID-19 environment, ethics, and the broader governance structure and team structure.

4.5.1 COVID-19 safety procedures and protocols

The preliminary survey took place during the outbreak of the COVID-19 pandemic. As such, a COVID-19 Standard Operation Procedure (SOP) was designed to ensure compliance with a set of rules, regulations, principles, and guidelines imposed to mitigate the exposure and risks of infections to research participants and data collectors. Prior to the study, all enumerators were tested for COVID-19. Each research team, under the leadership of their team leader, was provided with COVID-19 apparatus such as thermometers and protection during the fieldwork. All COVID-19 prevention precautionary measures were strictly adhered to throughout the data collection exercise.

4.5.2 Survey data collection

Some of the salient steps articulated to field workers during the training included:

- Entering an SAL (community entry and stakeholder identification), identification of Visiting Points (VPs) (using maps and GPS coordinates), selection of household (using the Kish Grid), and obtaining verbal consent.

4.5.3 Structured household questionnaire administration

This component constituted the quantitative dimension of food and nutrition security. This approach employed a survey which involved structured household questionnaire administration in the five districts. A total of 119 Small Area Layer (SALs) with a total of 2 380 households in each visiting point were preselected for the survey using Geographic Information Systems with maps developed and used for identification of the selected households. A combined set of questionnaires with both food security and nutrition indicators was administered within a household.

In each household, the head of the household was targeted as a respondent on household food security status, whilst the care giver or the mother was targeted as a respondent for individual nutrition questions for adults and children within the household. The food utilisation dimension involved anthropometric measurements such as height, weight, etc. (see Table 1). Data collection was done using tablets that were linked to the central server, where data was deposited through real-time streaming that took place under strict supervision.

- Rigorous training was done on the data collection instruments i.e., household questionnaire, looking at all the dimensions of food security and the questions which related to the food security and nutrition indicators thereof.
- The nutrition section of the household questionnaire followed the SMART standard procedure. Some of the key indicators pertain to anthropometric measurements and MUAC, as well as the individual household set of questions.

4.5.4 HEA Data collection

Discussions were undertaken with community representatives (key informants) to develop wealth breakdown for the selected community or study area. A grouping of people based on local definitions of wealth and a quantification of assets within communities was the major focus. This process disaggregated the community population and households into common 'access' groups, which allowed key informants to isolate important differences in households' assets, capital, vulnerabilities to different shocks and to estimate numbers of people who will be affected by different changes. Key informants from each communities managed to identify participants for each wealth group based on the wealth characteristics which were established based on the local definition of wealth. Community leaders assisted with organising 4-6 people from each wealth group from different households. At least half of the participants or groups were women. The approach identified a typical household size of each wealth group and quantified available household food and income sources to caloric measurement (8800KJ/person/day) and income equivalent to meet household needs for the whole year. The 8800KJ/person/day is used as a survival threshold. Some of the salient HEA steps articulated to field workers during the training included:

- Broader understanding of livelihood strategies;
- Problem specification and understanding of the coping strategies.

4.6 HEA Sampled Livelihood Zones

4.6.1 Northern Open Access Cattle and Dryland Crops Livelihood Zone (ZANOC) of Waterberg and Capricorn districts

This ZANOC Zone is located on the lowveld and midlevel plains in the north-west of Limpopo Province, with two small areas south-west and north of the Soutpansberg in Vhembe District.

The rainfall (the long-term average annual precipitation is 200 to 400 mm in the north and just over 400 mm in the south-west) is barely adequate for dry land crop farming, and the soils are poor. Almost all of the zone is 'moderate to severe' in water availability, the remainder being 'severe'. The savannah vegetation is well suited to cattle, and these are important for livelihoods. Apart from cattle, households depend on petty trading, remittances, and grants. Figure 3 is a map of the zone, and Figure 2 shows its location.

The N11 is the main trunk route through the zone, although the N1, the R521 and the R518 skirt large sections. The R567, R523, and R522 provide important access to the northern areas. Polokwane serves as the main administrative and business centre for people in the zone, although Louis Trichardt is an important centre up north.

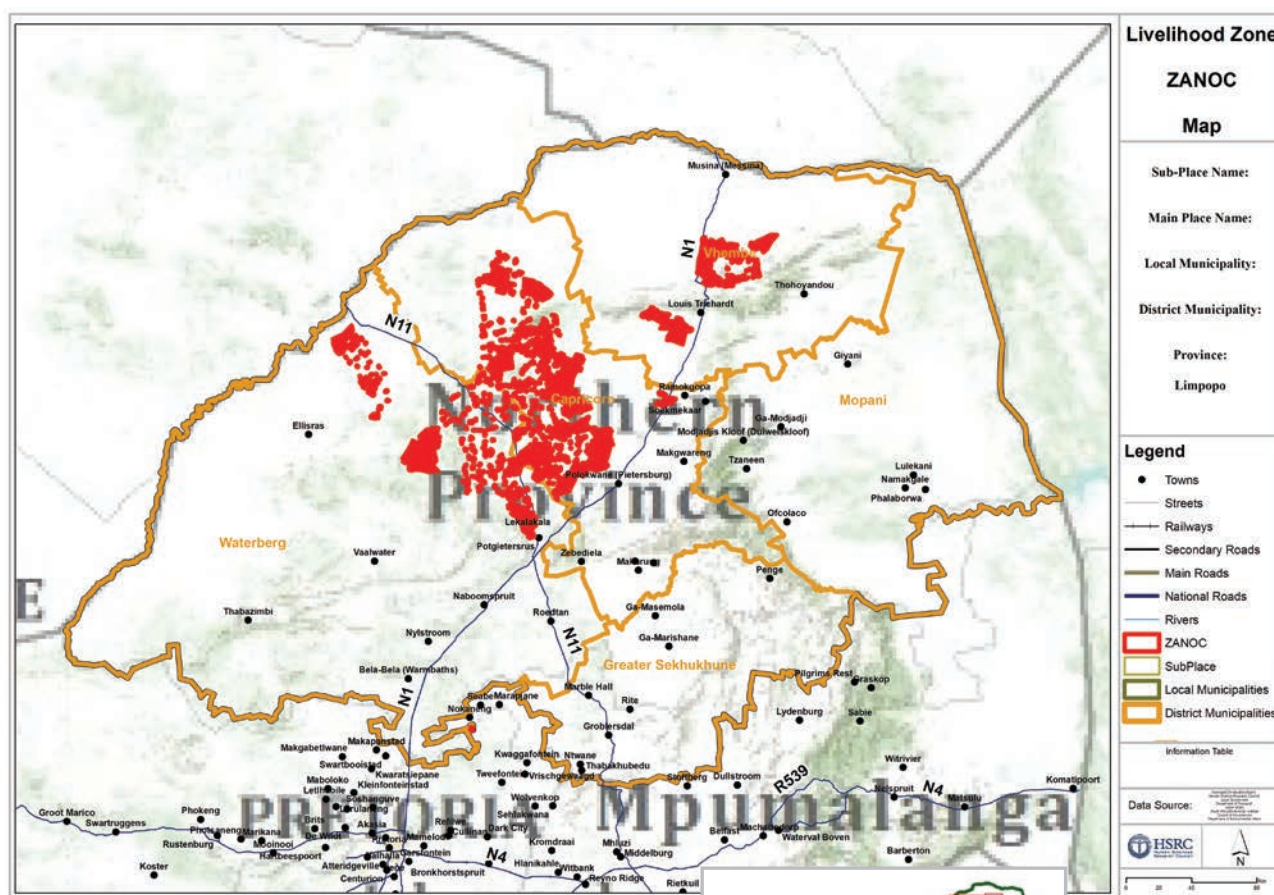


Figure 3: Map of ZANOC Livelihood Zone

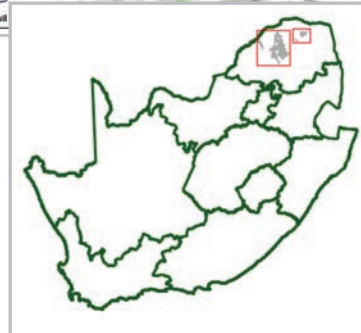


Figure 4: ZANOC Livelihood Zone location

Table 5: Census 2011 population breakdown of districts and municipalities covered by ZANOC Livelihood Zone

Province	District	Municipality	Pop. Est. in ZANOC	Percent of total
Limpopo	Capricorn	Aganang	129,795	98.97%
		Blouberg	133,965	82.38%
		Molemole	62,067	57.28%
		Polokwane	122,238	19.44%
	Vhembe	Makhado	133,605	26.05%
		Thulamela	264	0.04%
	Waterberg	Bela-Bela	2,781	4.18%
		Lephalale	50,154	43.32%
		Mogalakwena	183,396	59.62%
Provincial Total			818,265	15.15%

Source: Statistics South Africa, Census 2011 small area population data

As Figure 3 shows, the livelihood zone spans across nine municipalities in three districts. There are also areas in each municipality (some quite small, for example, in Aganang) that are not part of the zone. The total population in the zone is 818,265 and this is 15,15% of the provincial total (StatsSA, 2011). The breakdown for each municipality is given in Table I.

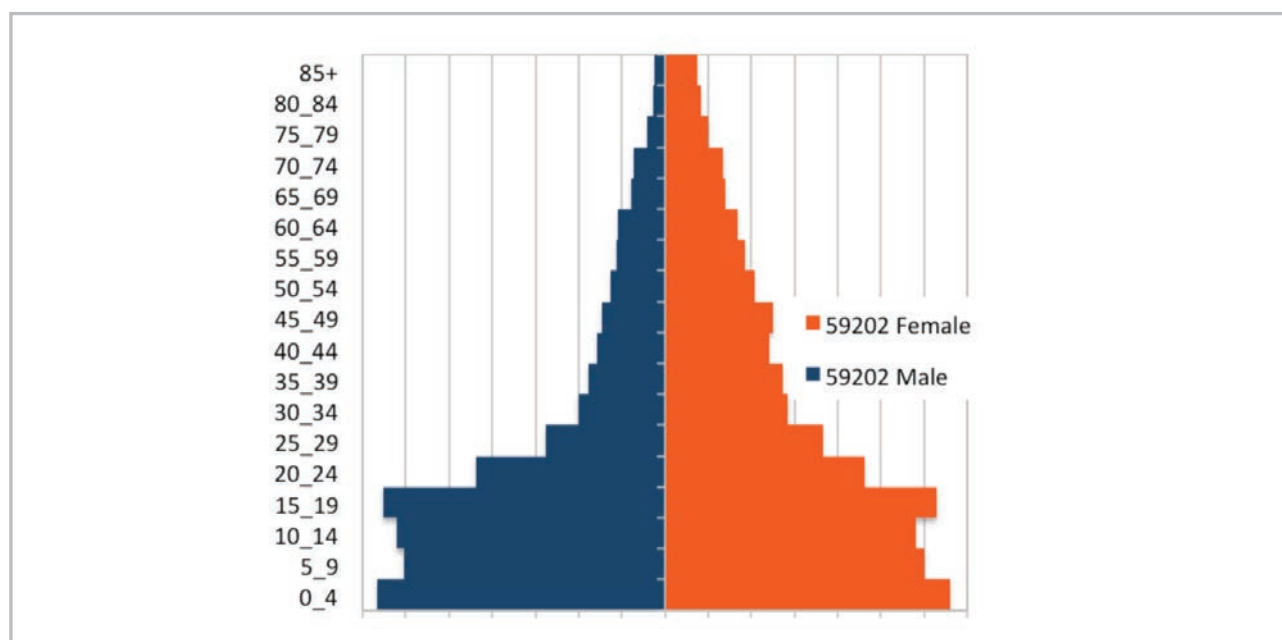


Figure 5: Gender and age breakdown of ZANOC Zone population

The age and gender pyramid for the whole zone is given in Figure 5. It is important to note the low percentages of adult men as well as the high proportion of children (younger than 20). This unbalanced gender and dependency ratio is a consequence of apartheid, as most of the zone was a part of the former Bantustans, supplying labour to urban, industrial, and mining areas. The persistence of this pattern leads to shortages in the zone of human capital, which has impacts on productivity.

4.6.2 North Eastern Limpopo Open Access Farming (ZALOF) of Makhado, Mutale, and Thulamela

This zone lies entirely in Vhembe District on the southern slopes of the Soutpansberg range. Livelihoods are based on farming and other sources of income such as casual labour, small business, grants, and salaried employment.

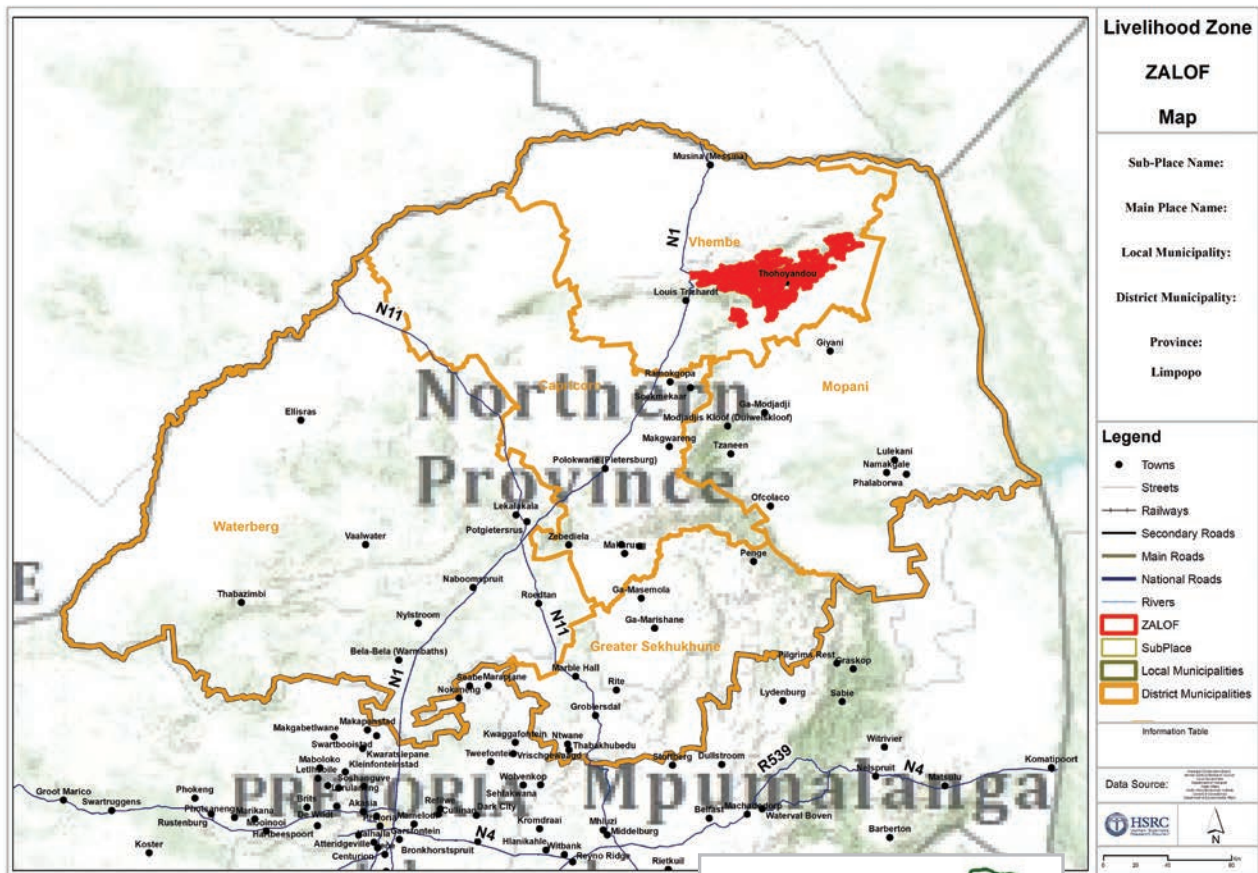


Figure 6: Map of ZALOF Livelihood Zone

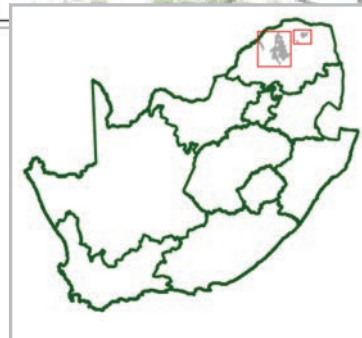


Figure 7: ZANOC Livelihood Zone location

The zone is well-watered, with an average annual rainfall of 600mm to 1,000mm. Being tropical, it enjoys a moderate climate that makes it a productive farming area, with tropical fruits and vegetables.

It is densely populated, and farm holdings are small. Slope decreases the land available for cultivation.

Figure 6 is a map of the zone, and Figure 7 shows the location. The R524 and the R529 are important feeder roads through the zone, connecting it to the main north-south N1 highway. The main centre for administration and commerce is Thohoyandou - with Louis Trichardt and, further away, Polokwane - acting as additional centres. Thohoyandou itself has many satellite towns and centres that serve as centres for trade and as transport hubs.

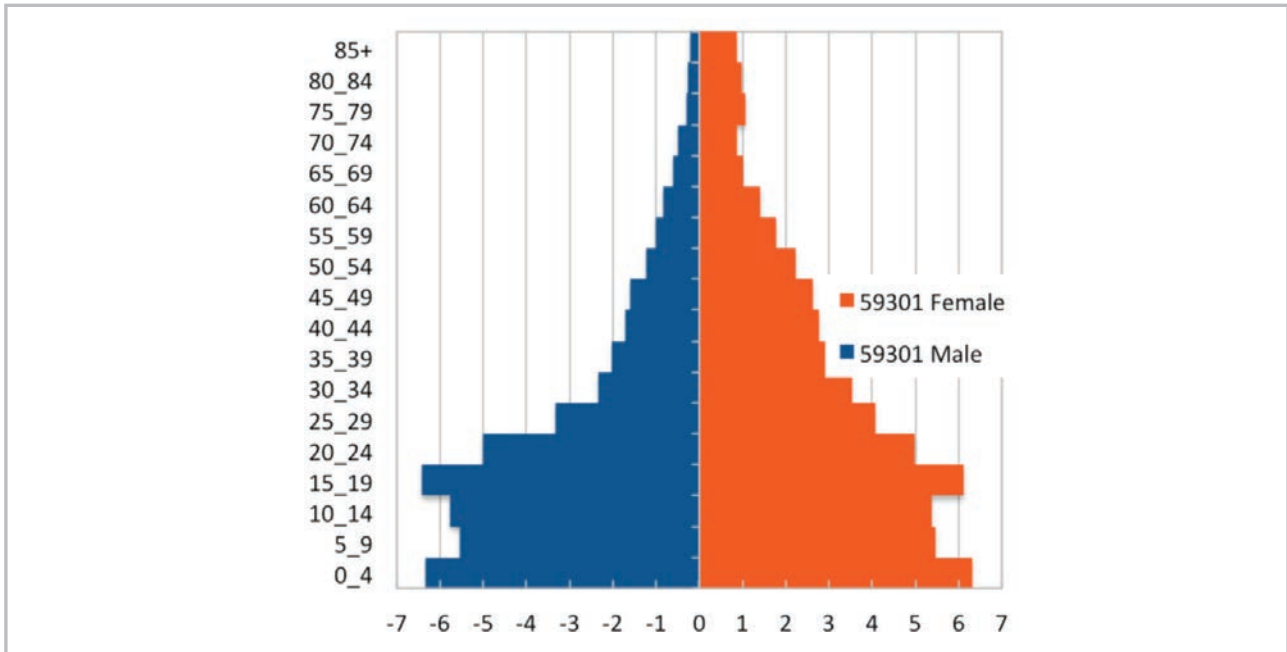


Figure 8: Gender and age breakdown of ZALOF Zone population

The zone spans three municipalities in one district. However, not all of these three municipalities are included in the zone; substantial areas and populations from each municipality are excluded. The total population in the zone is 391,146 (from Census 2011) and this is 7.24% of the provincial total. Table I and Figure 8 show the breakdown for each municipality and the gender / age breakdown.

Table 6: Census 2011 population breakdown of districts and municipalities covered by ZALOF Livelihood Zone

Province	District	Municipality	Pop. Est. in ZALOF	Percent of total
Limpopo	Vhembe	Makhado	111,234	21.69%
		Mutale	6,246	6.81%
		Thulamela	273,666	44.26%
Provincial Total			391,146	7.24%

Source: Statistics South Africa, Census 2011 Small Areas.

The unbalanced gender and dependency ratio is a consequence of apartheid, as the zone was a part of a former Bantustan (Venda), supplying labour to urban, industrial, and mining areas. The persistence of this pattern leads to shortages in the zone of human capital, which has impacts on productivity.

4.6.3 Lowveld Open Access Irrigated Cropping Livelihood Zone (ZALOI) of Mopani and Vhembe

This livelihood zone is defined by the existence of irrigation projects that support crop farming. It comprises of three areas:

- The largest, along the southern bank of the Klein (Little) Letaba River in Greater Giyani (just south of Giyani Town), is fed by water from the Middel-Letaba Dam;
- The valleys next to Tshiombo and Matangari in Thulamela Municipality (a small section is in Mutale Municipality), Vhembe District;
- The area between the Luvuvhu River and Tshifudi Village in Thulamela Municipality, Vhembe District.



Figure 9: Map of ZALOI Livelihood Zone

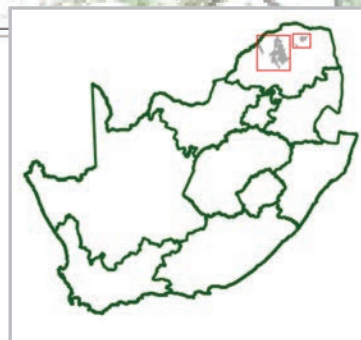


Figure 10: ZALOI Livelihood Zone location

Table 7: Census 2011 population breakdown of districts and municipalities covered by ZALOI livelihood Zone

Province	District	Municipality	Pop. Est. in ZALOI	Percent of total
Limpopo	Mopani	Greater Giyani	22,419	9.18%
		Mutale	1,395	1.52%
	Vhembe	Thulamela	27,141	4.39%
Provincial Total			50,955	0.94%

Source: Statistics South Africa, Census 2011 small area population data

Most of the zone receives 400 to 800mm mean annual rainfall, with the two areas in the north receiving more; the irrigation schemes were constructed to boost this to above 1000mm. Without irrigation, moisture availability is considered 'slight' and the land capability in the zone is classified as 'marginal potential arable', due to its low rainfall, soils, and slope. Farmers complained about the condition of the irrigation projects, saying that lack of maintenance has made them less effective. Wealthier households keep cattle, which make

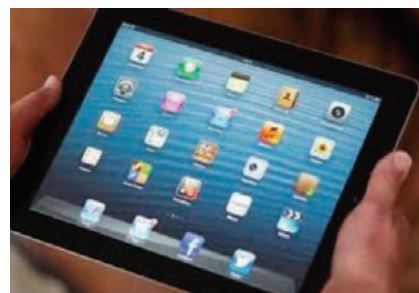
use of the extensive grazing in the surrounding veld. Households also depend on casual labour, remittances, and grants.

Figure 9 is a map of the zone, and Figure 10 shows the location. The Giyani section is served by the R81, while the Thulamela section is served by the R524, that comes from Louis Trichardt through Thohoyandou. Giyani and Thohoyandou serve as the main administrative and business centres for people in the zone, while Polokwane is the secondary, larger centre.

4.7 Data management, Weighting and Analysis

4.7.1 Data management

A database reflecting the quantitative survey questionnaire was designed by joining different projects/ forms using the REDCap. REDCap was the preferred technology because the application allows for data collection where there is no internet service (e.g., no Wi-Fi or cellular service) or where there is unreliable internet service. The data was captured/collected electronically using CAPI (Computer Assisted Personal Interviewing) technology by using tablets.



The data was transmitted to the central database. Once all the data was collected, it was downloaded and converted into Statistical Analyses Systems (SAS) and Statistical Package for Social Scientists (SPSS) for further manipulation. Data management included data-cleaning exercises. Data was checked and edited for logical consistency, for permitted range checks, for reliability on derived variables, and for filter instructions. Data with wrong small area layer (SAL) numbers was also cleaned.

Due to the COVID-19 pandemic, HSRC researchers could not do physical back checks, but extensive telephonic back checks were undertaken in the province. A total of more than 15% back checks were undertaken to validate the methodology and fill in the missing gaps in the data.

Captured data and validated data that contains 2 043 cases, and 3 513 variables was converted to (SPSS) for descriptive analyses and exploration of data quality. Verified and cleaned data was further converted to Stata and SAS for further detailed exploratory analyses, cross-tabulations, weighting, and analyses.

4.7.2 Data weighting

The data was weighted to take into account of the fact that not all participants covered in the survey had an equal chance of being selected. The weighting reflected the relative selection probabilities of the individual at the three main stages of selection: visiting point (address), household, and individual. To ensure the representativity of non-responses and smaller groups, weights need to be applied.

SAL base weights were appropriately adjusted to incorporate non-response at an SAL level. Households within SAL also had a base weight as they were sampled a priori. However, not all sample households were available or agreed to participate. Thus, the household base weights were further adjusted using a non-response correction factor of the ratio of sampled households divided by realised households. Sampled individuals within a household had a weight computed as the ratio of the number of eligible household members and the targeted individuals in the household. The final sample individual weight was computed as the product of the weights from SAL, household, and individual.

The survey is a national survey, and thus, the results should be generalisable to the entire population. The sample was then benchmarked to the population of the province. These benchmark variables for persons and district of the respondent in the household were selected due to their reliability and validity. The marginal totals for the benchmark variables were obtained from the Limpopo Province 2021 mid-year population estimates published by Statistics South Africa. The estimated South African population was therefore used as the target population. Person and household weights were benchmarked using the Stata survey commands.

A total of 2 043 people were interviewed in this province. When weighted, this total represents 3 321 928 South Africans living in the Limpopo Province who are 18 years and older.

The final data set (unweighted and weighted) is disaggregated by key demographic variables of household heads.

Table 8: District weighted and unweighted N's for household heads

District	Unweighted N	Weighted N
Capricorn	382	667 791
Sekhukhune	439	996 904
Mopani	434	372 805
Vhembe	425	560 104
Waterberg	363	724 325
Total	2 043	3 321 928

Table 9: Gender weighted and unweighted N's for household heads

Gender	Unweighted N	Weighted N
Male	944	1622116
Female	1099	1699813
Total	2 043	3 321 928

Table 10: Age groups weighted and unweighted N's for household heads

Age groups	Unweighted N	Weighted N
18-24	81	167 715
25-34	232	352 987
35-44	312	581 248
45-54	384	668 529
55-64	424	499 703
65-74	351	699 858
75+	237	32 6103
No Answer	22	25 786
Total	2 043	321 928

4.7.3 Data analysis

Descriptive statistical analyses were conducted as a first step towards developing insights from the data collected. Stata and SPSS software packages were used to obtain the proportions of responses and cross-tabulations. Weighted [benchmarked to the 2021 mid-year] population estimates provided by Statistics South Africa (StatsSA) for age, race, age group, and province], were done to ensure that the estimates of the food and nutrition survey variables were aligned with the general population of the Limpopo Province. Analyses of weighted data were conducted, taking into account the multi-level sampling design, and adjusting for non-responses.

5.1 Demographics of the respondents

5.1.1 Characteristics of the household heads and members

Table 11 depicts the characteristics of households heads and members from the households that were realised. More than half (53.8%) of household heads were females. The Black African population group accounted for 98.9%, while those aged 65 years old and older constituted 29.1% (Table 11). The youth (18-34 years old) constituted the lowest percentage, with 4.0%. In terms of marital status, those who were married or living together accounted for 44.4%. Sekhukhune and Mopani recorded about 21% each, while Waterberg accounted for the least proportion with 17.8%. With regards to household members, the majority were children aged 14 or younger, with 34.1%. Three out of four household members were single.

Table 11: Characteristics of the sample for household heads and members

Variable	Household heads			Household members		
	%	95% CI	n	%	95% CI	n
Sex						
Male	46.2	[44.1-48.4]	944	44.5	[43.4-45.5]	3,578
Female	53.8	[51.6-55.9]	1,099	55.5	[54.5-56.6]	4,470
Total	100.0		2,043	100.0		8,048
Population group						
Black African	98.9	[98.3-99.3]	2,020	98.8	[98.5-99.0]	7,811
White	0.9	[0.6-1.4]	18	0.8	[0.6-1.0]	61
Indian/Asian	0.2	[0.1-0.5]	4	0.3	[0.2-0.5]	25
Coloured	0	[0.0-0.3]	1	0.1	[0.0-0.2]	7
	-	-	-			
Total	100.0		2,043	100.0		7,904
Age group (years)						
0-14	-	-	-	34.1	[33.1-35.2]	2,569
18-24 (15-24 for HH members)	4.0	[3.2-5.0]	81	18.5	[17.6-19.4]	1,392
25-34	11.5	[10.2-12.9]	232	14.5	[13.8-15.3]	1,094
35-44	15.4	[13.9-17.1]	312	9.9	[9.2-10.6]	744
45-54	19.0	[17.3-20.8]	384	7.5	[7.0-8.2]	568
55-64	21.0	[19.3-22.8]	424	7.1	[6.5-7.7]	531
65+	29.1	[27.2-31.1]	588	8.4	[7.8-9.0]	631
Total	100.0		2,021	100	100.0	7,529

Variable	Household heads			Household members		
	%	95% CI	n	%	95% CI	n
Marital status						
Married/Living together	44.4	[42.0-46.9]	710	18.7	[17.8-19.6]	1,373
Divorced/Widowed/Separated	23.3	[21.3-25.4]	372	5.8	[5.3-6.4]	429
Single	32.3	[30.1-34.7]	517	75.5	[74.5-76.5]	5,551
Total	100.0		1,599	100.0		7,353
District						
Capricorn	18.7	[17.1-20.4]	382	17.2	[16.4-18.0]	1,400
Sekhukhune	21.5	[19.8-23.3]	439	23.4	[22.5-24.4]	1,906
Mopani	21.2	[19.5-23.1]	434	20.2	[19.3-21.1]	1,641
Vhembe	20.8	[19.1-22.6]	425	20.7	[19.8-21.6]	1,684
Waterberg	17.8	[16.2-19.5]	363	18.5	[17.7-19.3]	1,504
Total	100.0		2,043	100.0		8,135

*CI - Confidence Interval: Subtotals for the Province are not always equal due to non-response or missing data"

5.1.2 Education attainment of household heads

Education attainment plays a role in household heads' ability to access information and make informed decisions for improved household welfare. The largely depends on literate levels. Table 12 highlights the education attainment of the household heads. Secondary school education accounted for 28.1%, followed by primary school education with 28.1%. A small proportion of household heads (14%) had tertiary education. Education levels varied with gender, age, and district – with females attaining less education compared to males. For example, while only 8.7% of females had tertiary qualifications, more than a fifth (20.5%) of male household heads had attained tertiary education. A higher proportion of females (22.3%) had no schooling compared to males. The older household heads, those aged 65 years and older and those aged 55 to 64 years, had higher percentages of no schooling, with 35.6% and 22.8%, respectively. Sekhukhune District (19.5%) had the highest proportion of those who completed tertiary education, followed by Capricorn (17.4%). Waterberg (6.7%) had the lowest proportion of those who had tertiary education. Mopane District (20.9%) had the highest proportion of those who had no schooling, followed by Capricorn (18.5%) and Sekhukhune (17.8%).

Table 12: Educational attainment of household heads by sex, age, and district

	No schooling		Primary		Secondary		Matric		Tertiary	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Sex										
Male	11.9	[7.3-18.7]	25.7	[20.8-31.2]	23.5	[15.4-34.3]	18.4	[14.0-23.7]	20.5	[11.4-34.1]
Female	22.3	[17.3-28.2]	25.9	[22.3-29.8]	31.8	[25.4-39.0]	11.4	[8.4-15.2]	8.7	[5.5-13.5]
Total	17.6	[13.9-22.1]	25.8	[22.9-28.9]	28.1	[24.9-31.5]	14.5	[11.8-17.7]	14.0	[9.3-20.6]
Age group										
18-24	0.8	[0.2-3.3]	5.1	[1.3-17.4]	24.7	[10.4-48.2]	54.6	[26.4-80.1]	14.9	[3.9-43.0]
25-34	0.9	[0.3-2.6]	6.4	[3.3-11.9]	48.1	[36.5-59.9]	21.9	[15.3-30.2]	22.8	[13.3-36.2]
35-44	2.6	[0.9-7.3]	11.5	[6.7-19.1]	53.1	[37.3-68.3]	20.3	[13.2-29.8]	12.5	[6.3-23.3]
45-54	11.7	[5.3-24.1]	14.2	[8.1-23.6]	28.9	[17.4-44.0]	21.0	[12.6-33.1]	24.1	[11.0-45.1]
55-64	22.8	[17.2-29.6]	40.1	[33.3-47.3]	21.8	[16.5-28.2]	7.7	[4.6-12.6]	7.6	[4.7-12.1]
65+	35.6	[23.6-49.7]	44.3	[36.2-52.6]	10.2	[6.1-16.6]	1.6	[0.6-3.8]	8.4	[3.5-18.9]
Total	17.6	[13.9-22.1]	25.8	[23.0-28.9]	28.0	[24.8-31.4]	14.6	[11.9-17.7]	14	[9.3-20.6]

	No schooling		Primary		Secondary		Matric		Tertiary	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
District										
Capricorn	18.5	[8.1-37.0]	18.9	[14.8-23.7]	28.7	[21.3-37.5]	16.5	[7.8-31.6]	17.4	[11.3-25.6]
Sekhukhune	17.8	[12.4-25.1]	25.3	[20.9-30.3]	23.6	[20.6-27.0]	13.8	[11.1-16.9]	19.5	[9.9-34.7]
Mopani	20.9	[16.7-25.8]	26	[20.3-32.6]	26.2	[21.4-31.8]	12.4	[9.8-15.6]	14.5	[10.2-20.2]
Vhembe	15.0	[9.6-22.8]	29.5	[21.6-38.9]	27.4	[21.5-34.2]	17.5	[13.6-22.3]	10.6	[5.1-20.5]
Waterberg	17.0	[10.3-26.7]	29.5	[24.9-34.6]	34.5	[28.0-41.6]	12.3	[7.8-18.9]	6.7	[2.9-14.8]
Total	17.6	[13.9-22.1]	25.8	[22.9-28.9]	28.1	[24.9-31.5]	14.5	[11.8-17.7]	14.0	[9.3-20.6]

5.1.3 Education attainment of household members

Table 13 shows the education attainment of the household members aged 7 years and older. Secondary school education accounted for 33.9%, followed by those with primary school education at 30.9%. The older household members, those aged 65 years and older and those aged 55 years to 64 years, had higher percentages of no schooling, with 41.8% and 19.0%, respectively. When considering those aged 20 years and older, 9.7% of household members did not have any form of schooling, while 25.2% had matric education.

Table 13: Educational attainment of household members aged 7 years and older by sex, age, and district

	No schooling		Primary		Secondary		Matric		Tertiary	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Sex										
Male	3.7	[2.9-4.6]	33.6	[31.7-35.5]	34.7	[32.7-36.8]	18.7	[17.2-20.3]	9.4	[8.0-11.0]
Female	8.8	[7.7-10.0]	28.9	[27.5-30.5]	33.3	[31.7-35.0]	18.7	[17.3-20.3]	10.2	[8.9-11.7]
Total	6.6	[5.9-7.4]	30.9	[29.7-32.1]	33.9	[32.5-35.3]	18.7	[17.6-19.9]	9.8	[8.6-11.2]
Age group										
7-14	0.6	[0.2-1.3]	83.1	[81.2-84.9]	14.9	[13.2-16.8]	0.8	[0.4-1.5]	0.7	[0.3-1.3]
15-24	0.5	[0.2-1.1]	6.7	[5.2-8.4]	55.1	[52.3-57.8]	27.4	[24.9-30.2]	10.3	[8.4-12.7]
25-34	0.3	[0.1-0.9]	6.1	[4.5-8.2]	40.3	[36.9-43.9]	33.6	[30.4-36.9]	19.7	[17.0-22.7]
35-44	1.5	[0.7-3.5]	11.1	[8.8-13.9]	43.3	[39.3-47.3]	30.4	[27.1-33.9]	13.7	[11.1-16.9]
45-54	5.2	[3.5-7.6]	18.0	[14.5-22.1]	38.0	[33.4-42.9]	23.8	[20.0-28.1]	15.0	[11.7-19.0]
55-64	19.0	[15.4-23.2]	39.3	[35.0-43.7]	23.1	[19.4-27.4]	9.5	[7.0-12.6]	9.1	[6.6-12.6]
65+	41.8	[37.0-46.6]	39.0	[34.6-43.6]	12.6	[9.5-16.6]	2.5	[1.4-4.4]	4.1	[2.6-6.5]
Total	6.6	[5.9-7.4]	30.9	[29.7-32.1]	33.9	[32.6-35.4]	18.7	[17.5-19.9]	9.9	[8.7-11.3]
District										
Capricorn	6.2	[4.7-8.3]	29.3	[26.3-32.5]	34.6	[31.8-37.5]	19.6	[16.9-22.6]	10.3	[7.4-14.1]
Sekhukhune	7.2	[6.0-8.6]	31.5	[29.6-33.6]	33.9	[31.2-36.6]	17.8	[15.7-20.3]	9.6	[7.4-12.5]
Mopani	7.1	[5.5-9.1]	29.3	[27.1-31.5]	35.5	[33.1-38.0]	17.8	[15.6-20.3]	10.3	[8.1-12.9]
Vhembe	6.5	[4.9-8.6]	33	[30.8-35.3]	31.2	[27.7-34.9]	19.4	[17.0-22.0]	9.9	[7.6-12.8]
Waterberg	5.4	[4.0-7.2]	31.1	[27.0-35.6]	35.8	[33.5-38.3]	18.5	[16.0-21.2]	9.1	[5.8-14.0]
Total	6.6	[5.9-7.4]	30.9	[29.7-32.1]	33.9	[32.6-35.4]	18.7	[17.5-19.9]	9.9	[8.7-11.3]

5.1.4 Employment Status

Table 14 shows that among the household heads and members who were economically active, 62.2% and 78.3%, respectively, were unemployed. A higher proportion (74.2%) of female household heads were unemployed, compared to their male counterparts, with 48.6% being unemployed. Around 80% of female household members were unemployed. Among the youth, those aged 34 years or younger, the unemployment rate was 60.3% and 87.7% for household heads and members, respectively. The highest unemployment rate (67.9%) among household heads was reported in Vhembe, followed by Capricorn with 64.4%. For all household members, Capricorn accounted for the highest unemployment rate, with 81.2%.

Table 14: Employment status of household heads by sex, age, and district

	Household heads				Household members			
	Employed		Unemployed		Employed		Unemployed	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Sex								
Male	51.4	[44.5-58.3]	48.6	[41.7-55.5]	25.1	[22.4-28.1]	74.9	[71.9-77.6]
Female	25.8	[20.3-32.2]	74.2	[67.8-79.7]	19.2	[17.3-21.2]	80.8	[78.8-82.7]
Total	37.8	[34.3-41.4]	62.2	[58.6-65.7]	21.7	[19.8-23.7]	78.3	[76.3-80.2]
Age group								
18-24 (15 -24 for HH Members)	45.5	[16.9-77.5]	54.5	[22.5-83.1]	4.0	[2.7-5.8]	96	[94.2-97.3]
25-34	35.9	[27.5-45.3]	64.1	[54.7-72.5]	23.3	[20.4-26.4]	76.7	[73.6-79.6]
35-44	42.2	[28.2-57.6]	57.8	[42.4-71.8]	33.9	[29.6-38.5]	66.1	[61.5-70.4]
45-54	43.4	[35.8-51.2]	56.6	[48.8-64.2]	43.5	[38.2-48.9]	56.5	[51.1-61.8]
55-64	23.8	[17.9-30.9]	76.2	[69.1-82.1]	23.3	[18.7-28.6]	76.7	[71.4-81.3]
Total	37.9	[34.4-41.5]	62.1	[58.5-65.6]	21.7	[19.8-23.7]	78.3	[76.3-80.2]
District								
Capricorn	35.6	[31.7-39.6]	64.4	[60.4-68.3]	18.8	[16.7-21.1]	81.2	[78.9-83.3]
Sekhukhune	41.1	[34.9-47.7]	58.9	[52.3-65.1]	22.1	[18.1-26.8]	77.9	[73.2-81.9]
Mopani	48.3	[41.7-54.9]	51.7	[45.1-58.3]	24.5	[21.5-27.8]	75.5	[72.2-78.5]
Vhembe	32.1	[24.3-41.0]	67.9	[59.0-75.7]	20.6	[15.7-26.5]	79.4	[73.5-84.3]
Waterberg	35.6	[28.2-43.8]	64.4	[56.2-71.8]	23.8	[18.7-29.7]	76.2	[70.3-81.3]
Total	37.8	[34.3-41.4]	62.2	[58.6-65.7]	21.7	[19.8-23.7]	78.3	[76.3-80.2]

At local municipality level, the following local municipalities: Thulamela, Blouberg, Makhuduthamaga, and Ephraim Mogale fall under the highest band (82.6% to 85.3%) of unemployed household members (Figure 10). Bela-Bela local municipality was under the lowest band, with 58.0% of household members being unemployed.

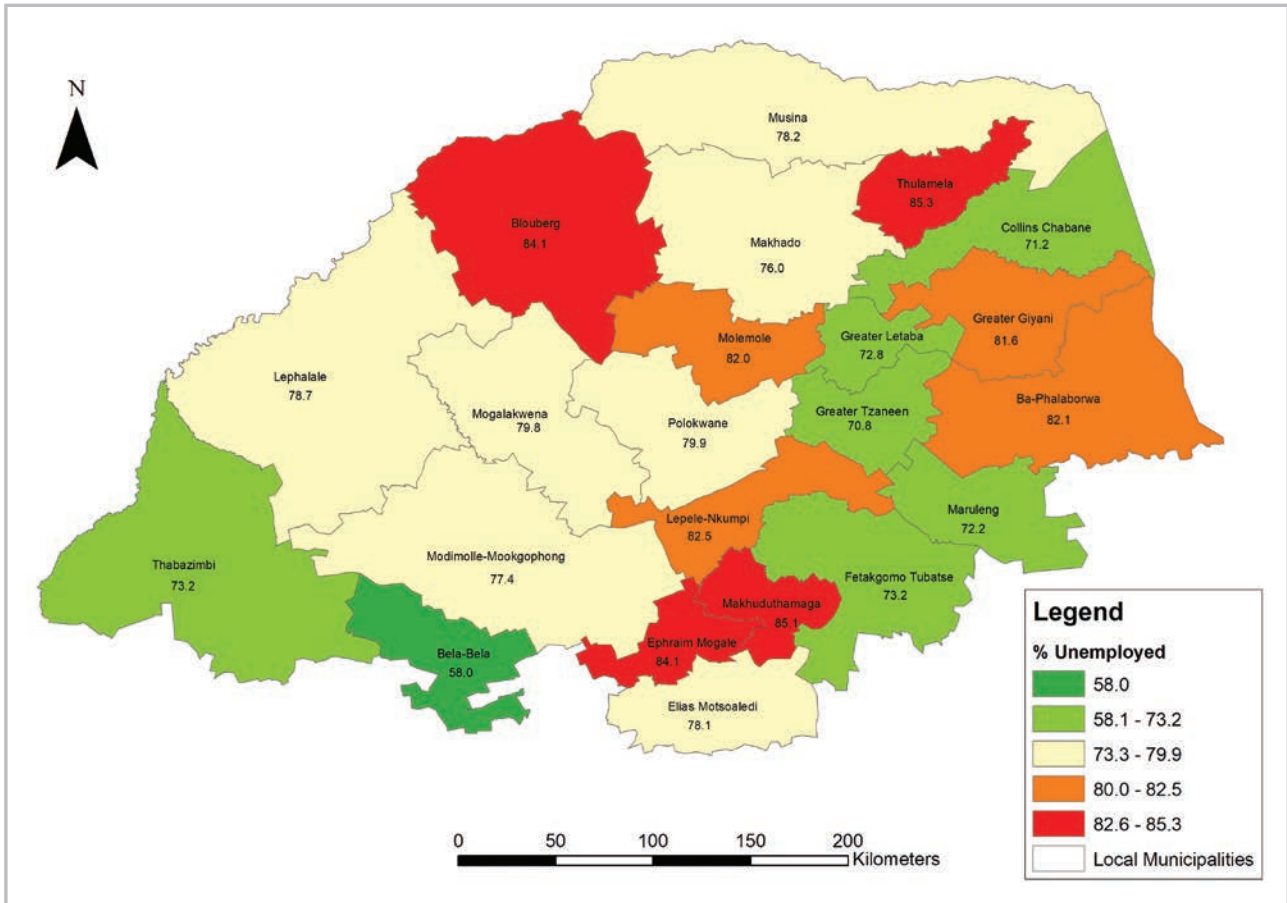


Figure 11: Employment status of household members by local municipality

5.1.5 Household income

Table 15 shows household income by household head sex, age, and district. The highest percentage (39.1%) of households had an income of between R1 501-R3 000, followed by those who had no income or earned less than R1 500 (23.2%).

Most households had less than R4 500 per month in the province. Only about 19% of the households earned more than R4 500 per month. These figures suggest that households in the Limpopo Province were characterised by low-income levels, with more than half earning less than R3 000 per month, indicating that most of the sampled households are poor and vulnerable to food insecurity. Males earned more income than females, with higher proportions of males than females in the income bands of more than R3 000 per month. In contrast, females had higher proportions than males in the lower income bands (less than R3 000 per month). Household heads in their prime working age (35-64) were more likely to have higher incomes than those younger or older. Mopani had the lowest percentage (19.4%) of households which had no income or earned less than R1 500, even though the difference was not significant based on the confidence intervals. Sekhukhune District (15.9%) had the highest proportion of those household heads who earned more than R6 000 per month.

Table 15: Household income by sex, age, and district

	Less than R1500		R1501-R3000		R3001-R4500		R4501-R6000		More than R6000	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Sex										
Male	21.2	[17.6-25.1]	33.9	[30.1-38.0]	20.8	[17.8-24.0]	6.3	[4.7-8.5]	17.8	[14.6-21.6]
Female	24.8	[21.7-28.2]	43.0	[39.4-46.7]	16.9	[14.5-19.8]	6.3	[4.9-8.1]	8.9	[7.2-11.0]
Total	23.2	[20.8-25.8]	39.1	[36.4-41.9]	18.6	[16.5-20.8]	6.3	[5.1-7.8]	12.7	[10.9-14.9]
Age group										
18-24	53.6	[39.5-67.2]	28.5	[17.1-43.5]	12.8	[5.7-26.2]	3.1	[0.7-11.8]	2.0	[0.3-13.4]
25-34	36.8	[29.2-45.0]	36.0	[28.1-44.7]	10.7	[6.2-17.8]	8.2	[4.6-14.1]	8.4	[4.9-14.0]
35-44	30.4	[24.6-36.8]	31.4	[25.2-38.4]	18.7	[14.5-23.8]	4.3	[2.4-7.7]	15.2	[10.6-21.4]
45-54	31.6	[26.4-37.3]	30.7	[25.1-37.0]	14.1	[10.3-19.1]	6.9	[4.2-11.1]	16.7	[12.4-21.9]
55-64	21.2	[17.1-25.8]	39.0	[34.1-44.2]	17.2	[13.2-22.1]	6.2	[4.0-9.6]	16.4	[11.9-22.2]
65+	8.6	[5.7-12.6]	50.2	[45.1-55.3]	25.3	[21.3-29.7]	6.8	[4.7-9.8]	9.2	[6.8-12.2]
Total	23.0	[20.7-25.6]	39.2	[36.5-41.9]	18.6	[16.6-20.9]	6.4	[5.2-7.8]	12.8	[10.9-15.0]
District										
Capricorn	24.7	[18.9-31.7]	43.9	[36.9-51.0]	15.5	[11.1-21.1]	5.6	[3.0-10.2]	10.3	[7.7-13.8]
Sekhukhune	21.6	[17.4-26.5]	37.7	[32.0-43.6]	17.2	[13.2-22.1]	7.6	[5.0-11.4]	15.9	[11.5-21.7]
Mopani	19.4	[15.2-24.4]	37.5	[32.1-43.2]	23	[18.0-28.9]	7.5	[5.5-10.3]	12.6	[9.0-17.3]
Vhembe	25.9	[21.1-31.4]	38.4	[33.6-43.4]	19.1	[15.9-22.9]	4.8	[3.0-7.7]	11.8	[7.7-17.6]
Waterberg	23.7	[18.8-29.4]	36.9	[31.5-42.5]	18.2	[14.7-22.4]	6.9	[4.5-10.4]	14.3	[10.7-19.0]
Total	23.2	[20.8-25.8]	39.1	[36.4-41.9]	18.6	[16.5-20.8]	6.3	[5.1-7.8]	12.7	[10.9-14.9]

5.1.6 Sources of income

Table 16 shows that the majority (52.1%) of household heads and 40.2% of household members relied on social welfare grants (including old age grant) as their source of income. This translates to an estimated number of 1 343 727 household heads and 2 004 506 household members relying on social welfare grants (including old age grant) as their source of income. About a fifth (21.9%) of household heads reported salaries and wages as their source of income.

Table 16: Sources of income of household heads and members

	Household heads	Household members
Source of income	%	%
Social welfare grants (including old age grant)	52.1	41.7
Salaries and wages	21.9	10.1
Net profit from business or professional practice/activities or commercial farming	5.1	1.7
Regular receipts from a pension from previous employment and pension from annuity funds	3.4	0.7

	Household heads	Household members
Source of income	%	%
Alimony, maintenance, and similar allowances from a divorced spouse, family members, etc., living elsewhere	3.0	1.1
Other	2.9	2.1
Regular allowances/remittances received from non- Household members	2.5	0.8
Income from small-scale farming	1.2	0.4
Income from letting of fixed property	0.6	0.1
Income from share trading	0.4	0.1
Dividends on shares (e.g., unit trusts)	0.3	0.1
Interest received and/or accrued on deposits, loans, savings certificates	0.2	0.0
Royalties	0.0	0.0

Further breakdown of social welfare grants as source of income of household heads and members by sex, age, and district is explored in Table 17. Although the average of those who reported social welfare grants as a source of income was 52.1%, significantly more female household heads (59.9%) relied on social welfare grants as a source of income compared to their male counterparts, with only 42.9% reporting social welfare grants as their source of income. Sekhukhune recorded the highest proportion (56.4%) of household heads who relied on social welfare grants as their source of income. Vhembe recorded the highest proportion (44.8%) of household members who relied on social welfare grants as their source of income.

Table 17: Social welfare grants as source of income of household heads and members by sex, age, and district

	Household heads who had social welfare grants as a source of income			Household members who had social welfare grants as a source of income		
	%	95% CI	n	%	95% CI	n
Sex						
Male	42.9	[37.5-48.5]	687	36.4	[33.8-39.1]	3,249
Female	59.9	[54.6-65.0]	914	46	[44.0-48.0]	4,075
Total	52.1	[47.8-56.3]	1,601	41.7	[39.8-43.7]	7,324
Age group						
0-14	-	-	-	49.2	[44.6-53.8]	2,428
18-24 (15 -24 for HH Members)	50.2	[21.3-79.0]	51	26.4	[23.8-29.2]	1,281
25-34	35.3	[26.8-44.9]	163	29.7	[26.3-33.3]	980
35-44	28.3	[19.8-38.5]	238	27.9	[24.4-31.6]	673
45-54	28.2	[22.4-34.9]	310	26.5	[22.5-31.0]	525
55-64	51.7	[43.7-59.6]	340	50.8	[45.9-55.8]	477
65+	86.5	[78.5-91.8]	496	88.4	[85.0-91.1]	590
Total	52	[47.7-56.3]	1,598	42.1	[40.2-44.0]	6,954

District						
Capricorn	54.5	[40.9-67.4]	283	43.8	[38.8-48.8]	1,268
Sekhukhune	56.4	[52.2-60.5]	356	40.6	[37.3-44.1]	1,688
Mopani	53.8	[48.0-59.4]	312	41.1	[37.9-44.3]	1,462
Vhembe	47.4	[40.0-54.9]	355	44.8	[41.4-48.2]	1,587
Waterberg	47.8	[37.5-58.3]	295	34.3	[28.9-40.1]	1,361
Total	52.1	[47.8-56.3]	1,601	41.7	[39.8-43.7]	7,366

*CI Confidence Interval: Subtotals for the Province are not always equal due to non-response or missing data

Figure 12 shows that Blouberg Municipality fell under the highest band (49.7% to 58.5%) of household members who had social welfare grants as a source of income. Magalakwena, Maruleng, Modimolle-Mookgophong, and Thabazimbi local municipalities recorded the least percentages of household members who had social welfare grants as a source of income as they were under the least band of 25.0% to 32.1%.

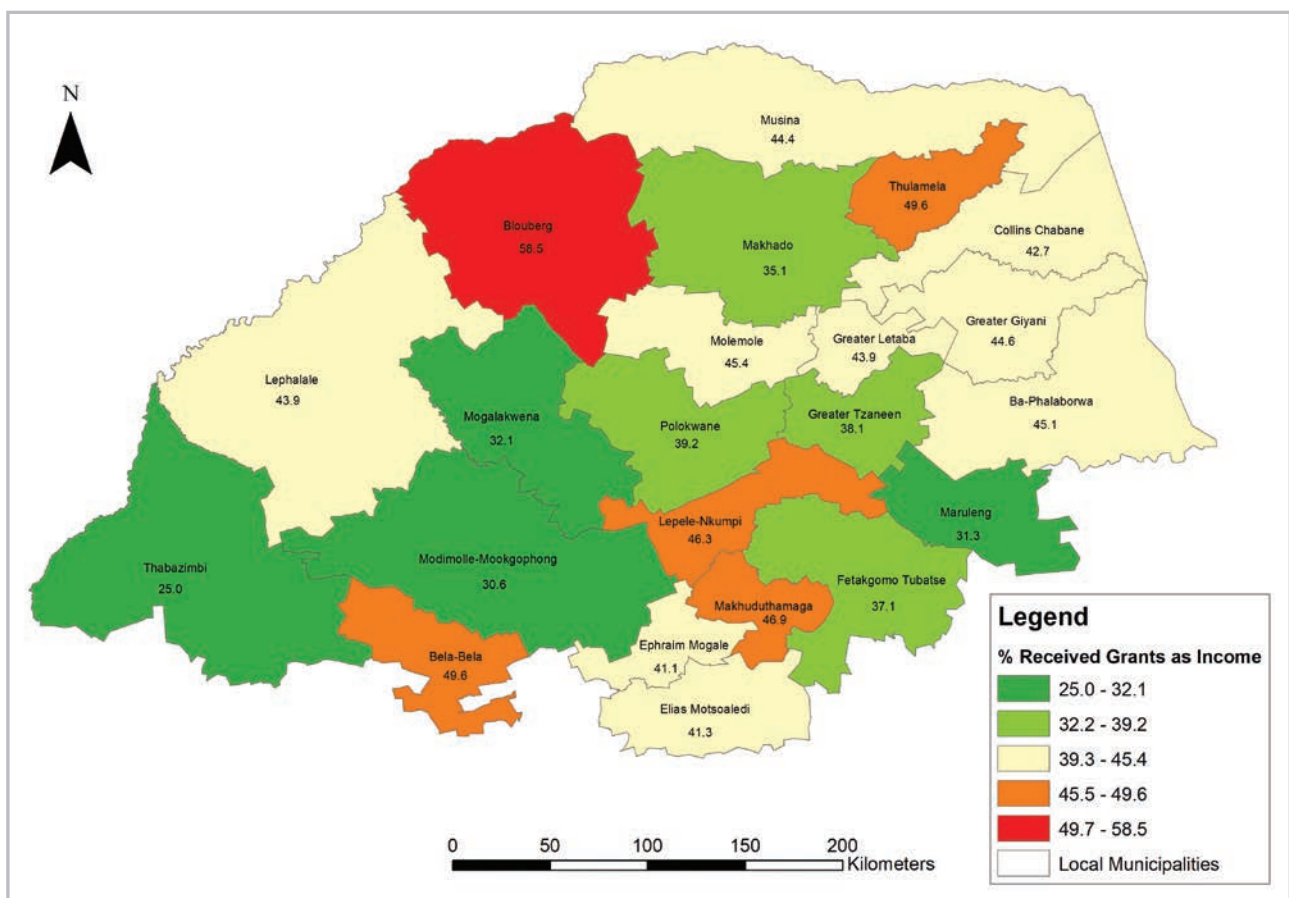


Figure 12: Social welfare grants as a source of income for household members by local municipality

5.1.7 Access to Social grants

Table 18 shows household heads and members reported as receiving any social grant(s) for the 12 months preceding the survey by sex, age, and district. Similar trends were noticed as those who reported social welfare grants as their source of income. The majority (93.5%) of elderly household members received social grants in the last the 12 months prior to the survey. Just above half (51.8%) of children aged 14 and younger received social grants in the year preceding the survey; this might indicate the dominance of child grants. Capricorn had the highest proportion of both household heads (55.6) and members (45.6) who had received social grants for 12 months preceding the survey.

Table 18: Household heads and members reported receiving any social grant(s) during 12 months prior to survey by sex, age, and district

	Household heads received social welfare grants a year prior survey			Household members received social welfare grants a year prior survey		
	%	95% CI	n	%	95% CI	n
Sex						
Male	40.8	[34.9-47.0]	740	38.8	[36.3-41.3]	3,252
Female	60.3	[54.6-65.7]	934	47.7	[45.7-49.7]	4,088
Total	51.2	[46.5-55.8]	1,674	43.8	[42.0-45.5]	7,340
Age group						
0-14	-	-	-	51.8	[47.3-56.4]	2,431
18-24 (15 -24 for HH Members)	16.7	[6.7-36.0]	58	28.6	[25.8-31.5]	1,285
25-34	31.1	[21.7-42.3]	174	28.9	[25.5-32.5]	982
35-44	25.7	[17.2-36.6]	251	30.0	[26.3-34.0]	675
45-54	30.8	[25.3-36.8]	325	29.0	[25.1-33.2]	527
55-64	52.6	[45.0-60.1]	353	51.4	[46.5-56.3]	478
65+	90.2	[80.9-95.2]	506	93.5	[90.4-95.6]	587
Total	51.1	[46.4-55.8]	1,667	44.1	[42.4-45.9]	6,965
District						
Capricorn	55.6	[41.7-68.7]	289	46.6	[42.4-50.9]	1,307
Sekhukhune	52.7	[43.8-61.4]	368	41.6	[38.0-45.3]	1,736
Mopani	54.0	[47.6-60.2]	344	41.4	[38.5-44.3]	1,581
Vhembe	45.9	[35.4-56.8]	367	45.5	[42.5-48.5]	1,657
Waterberg	48.7	[40.0-57.5]	306	40.9	[35.9-46.1]	1,424
Total	51.2	[46.5-55.8]	1,674	43.6	[41.9-45.3]	7,705

Regarding the grant type, the old age grant accounted for 69.2% of household heads, while the child support grant accounted for 63.1% of household members (Table 19). Cash was also received by 51.8% of household heads and 54.2% of household members. Food accounted for around 10% for both household heads and members.

Table 19: Social grant type received by household heads and members during 12 months prior to the survey

Grant type	Social Grant Beneficiaries	
	Household heads %	Household members %
Old age	69.2	23.9
Disability	4.9	3.3
Child support	21.9	63.1
Care dependency	0.5	0.4
Foster care	1.4	0.8
War veterans	0.2	0.0
Grant-in-aid	1.0	0.6
Social relief	20.3	20.3

Table 20 shows household heads and members who reported receiving social relief during the 12 months prior to the survey. One out of three household heads reported receiving social relief during the 12 months prior to the survey, while only a quarter of household members were reported to have received social relief.

Table 20: Household heads and members reported receiving social relief during 12 months prior to survey by sex, age, and district

	Household heads received social relief a year prior survey			Household members received social relief a year prior survey		
	%	95% CI	n	%	95% CI	n
Sex						
Male	32.4	[24.9-41.0]	739	25.4	[22.7-28.2]	3,248
Female	35.1	[29.6-41.1]	937	26	[23.1-29.1]	4,084
Total	33.9	[28.5-39.7]	1,676	25.7	[23.2-28.4]	7,332
Age group						
0-14	-	-	-	22.7	[18.7-27.1]	2,423
18-24	50.5	[22.5-78.1]	58	24.4	[21.4-27.7]	1,281
25-34	34.3	[25.9-43.7]	174	27.4	[24.2-31.0]	983
35-44	23.1	[13.9-35.7]	251	25.4	[22.1-28.9]	677
45-54	30.6	[25.0-36.8]	324	26.9	[23.1-31.1]	527
55-64	30.8	[24.4-38.0]	354	30.3	[25.9-35.2]	477
65+	41.0	[30.6-52.4]	508	39.2	[33.6-45.1]	589
Total	33.8	[28.5-39.6]	1,669	26.2	[23.6-28.9]	6,957
District						
Capricorn	42.1	[32.0-52.8]	291	33.5	[27.8-39.7]	1,311
Sekhukhune	36.0	[28.5-44.3]	367	21.4	[16.9-26.7]	1,728
Mopani	36.1	[28.7-44.2]	344	28.5	[24.1-33.3]	1,570
Vhembe	25.6	[19.5-32.8]	367	23.7	[18.9-29.3]	1,655
Waterberg	30.3	[16.9-48.3]	307	25.5	[19.3-32.9]	1,423
Total	33.9	[28.5-39.7]	1,676	26.6	[24.1-29.3]	7,687

*CI Confidence Interval: Subtotals for the Province are not always equal due to non-response or missing data

Most people received COVID-19 social relief grant, with household heads and members accounting for 62.1% and 58.3%, respectively (Table 21). Cash was also received by 51.8% of household heads and 54.2% of household members. Food accounted for around 10% for both household heads and members.

Table 21: Social relief type received by household heads and members during the 12 months prior to the survey

Social Relief Type	Household heads	Household members
Cash	51.8	54.2
Food	10.9	9.9
Blankets	0.3	0.1
Clothes	0.3	0.2
Other	0.9	1.1
COVID-19	62.1	58.3

Figure 13 shows that Lephalale and Musina local municipalities were under the lowest band (10.6% to 10.8%) of household members who received social relief during the year preceding the survey. Bela-Bela fell under the highest band of 36.8% to 48.1% of household members who received social relief during the year preceding the survey.

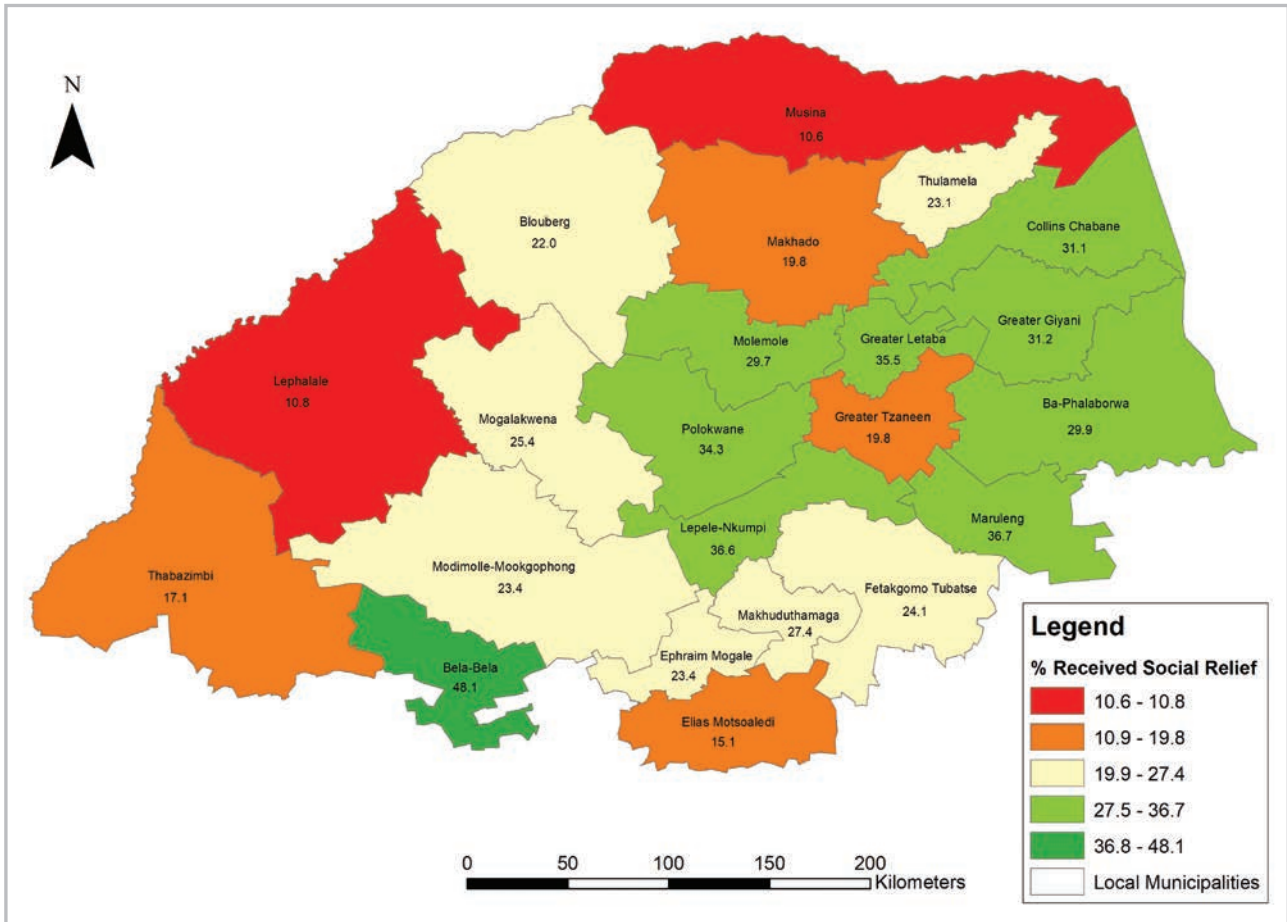


Figure 13: Household members who received any social relief during the 12 months prior to the survey by local municipality

Further breakdown of the COVID-19 grant received by household members showed that 58.1% of the female members received this social relief, compared to 53.7% of their male counterparts (Table 22). Those aged 25 to 34 years old had the highest proportion, with 74.2%, followed by those aged 35 to 44 years old, with 69.1%. Sekhukhune had the highest percentage (67.2%) of household members who received the COVID-19 social relief grant. Mopani had the lowest proportion of household members who received the COVID-19 social relief grant, with 49.5%.

Table 22: Household members reported receiving COVID-19 grant during 12 months prior to survey by sex, age, and district

	Yes		No		Total n
	%	95% CI	%	95% CI	
Sex					
Male	53.7	[47.5-59.8]	46.3	[40.2-52.5]	796
Female	58.1	[52.0-63.9]	41.9	[36.1-48.0]	1,054
Total	56.2	[50.6-61.6]	43.8	[38.4-49.4]	1,850

Age group					
0-14	33.5	[26.5-41.3]	66.5	[58.7-73.5]	540
15-24	59.2	[51.9-66.1]	40.8	[33.9-48.1]	307
25-34	74.2	[67.3-80.1]	25.8	[19.9-32.7]	263
35-44	69.1	[61.0-76.2]	30.9	[23.8-39.0]	167
45-54	65.8	[57.0-73.5]	34.2	[26.5-43.0]	139
55-64	59.4	[49.9-68.2]	40.6	[31.8-50.1]	142
65+	63.8	[55.5-71.4]	36.2	[28.6-44.5]	230
Total	55.6	[50.0-61.0]	44.4	[39.0-50.0]	1,788
District					
Capricorn	62.8	[51.0-73.4]	37.2	[26.6-49.0]	455
Sekhukhune	67.2	[56.6-76.2]	32.8	[23.8-43.4]	362
Mopani	49.5	[40.3-58.7]	50.5	[41.3-59.7]	448
Vhembe	51.9	[41.2-62.5]	48.1	[37.5-58.8]	388
Waterberg	63.9	[51.7-74.5]	36.1	[25.5-48.3]	361
Total	58.3	[53.1-63.4]	41.7	[36.6-46.9]	2,014

Figure 14 illustrates that Blouberg, Collins Chabane, Greater Giyani and Greater Tzaneen local municipalities were under the lowest band (30.4% to 38.7%) of household members who received the COVID-19 grant during 12 months prior to the survey. Lephalale and Thabazimbi local municipalities were under the highest band of 76.3% to 90.0% of household members who received the COVID-19 grant during the 12 months prior to the survey.

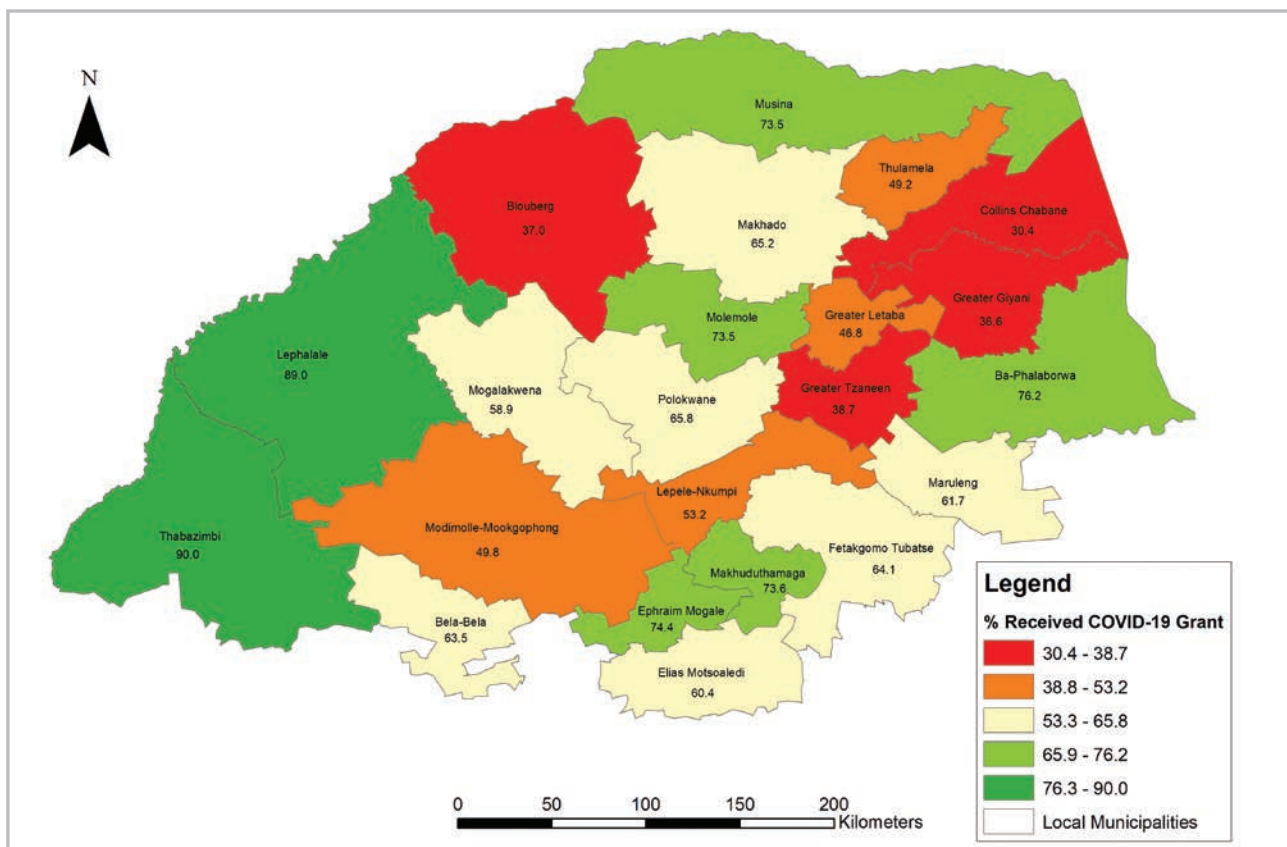


Figure 14: Household members who received any COVID-19 grant during the 12 months prior to the survey by local municipality

5.1.8 Discussion

It is important to give the context of the demographic characteristics of the current study population in relation to other recent nationally representative surveys. There were slightly less people with no schooling education (6.6%) compared to the 2016 survey, which had 13.9% (SADHS, 2019). On the other end, there were slightly more people with tertiary education, with 9.8% in the current study compared to 7.5% in the 2016 survey. For those aged 20 years and older, 9.7% of household members did not have any form of schooling compared to 5.7% (and it was the highest provincial record) in 2020, while 25.2% had matric education compared to 26.7% in 2020 (Stats SA, 2021).

In Limpopo Province the unemployment rate for household heads and members who were economically active from the current study was 62.2% and 78.3%, respectively, which is higher than the provincial official unemployment rate from the third quarter of the Quarterly Labour Force Survey in 2021, which was 32.5% (QLFS, 2021). This is probably because the survey was also able to capture people who are unemployed but not actively looking for work.

According to the General Household Survey, a larger percentage of households received grants compared to salaries as a source of income in Limpopo (69.3% versus 44.6%) in 2020. A similar pattern is noticed in the current study as the majority (52.1%) of household heads, and 40.2% of household members relied on social welfare grants (including old age grant) as their source of income, followed by those who relied on salaries with 21.9% and 10.1% for household heads and members, respectively.

The provincial average 43.8% of household members reported to be receiving social grants is in line with the Limpopo average for household population of 44.9% and 44.5% in 2016 and 2020, respectively (SADHS, 2016; Stats SA, 2021). In terms of the grant type, the child support grant was the most common type of grant, with 63.1% for household members. Although this was also the case in 2016, the percentage of the household population that received child grant in this province was lower, at 32.3% (SADHS, 2016). Unsurprisingly, children and the elderly were more likely than other age groups to receive some type of grant. In terms of the COVID-19 grant, 58.3% of household members were reported as having received this grant in Limpopo in 2021. This is higher than the provincial average of 8.9% of individuals who accessed the COVID-19 grants in 2020 (Stats SA, 2021). The reason behind this might be that the grant was being gradually rolled out as the pandemic was progressing. In addition, for 2020 statistics, only those aged 18 years and older were counted, whereas all household members were included in the current study.

5.2 Dwellings and Services

5.2.1 Housing types

Findings from the Limpopo Province show that the most common dwelling type occupied by households were formal housing structures. Dwelling and the type of housing used by the household can be used as a proxy for the wealth of the household. Table 23 presents the type of dwelling occupied by the households. The majority (94.4%) of the households within the Limpopo Province reside in formal dwellings or houses built of bricks and concrete. Few households reported living in traditional dwellings (1.0%) even though Limpopo Province is largely rural. Informal settlements were also reported among the common housing types occupied by households in the sample (0.8%).

Table 23: Types of dwellings occupied by households

Dwelling type (n=1823)	Percentage (%)	Total (n)
Formal dwelling/ House or brick/concrete	94.4	1721
Traditional dwelling/Hut/Structure made	1.0	19
Cluster house in a security complex	0.1	1
Town house (semi-detached house in a complex)	0.3	5
Semi-detached house	0.1	2
Formal dwelling /House/ Flat/Room in backyard	1.3	23
Informal dwelling/Shack in the backyard	1.3	23
Informal dwelling/Shack not in the backyard	0.8	15
Room/Apartment on a property or an apartment	0.4	8
Caravan/Tent	0.1	1
Other, (specify)	0.3	5
Total	100	1823

5.3 Access to water service

5.3.1 Households' main source of drinking water

The predominant source of water for the majority of the households (29.9%) was tap water inside the yard (Figure 15). This is followed by communal taps (19.7%) and boreholes outside the yards (16.6%). A small percentage of the households purchase water from vendors (7.4%). Our results further show that the availability of water inside the dwelling/houses is low (6.7%).

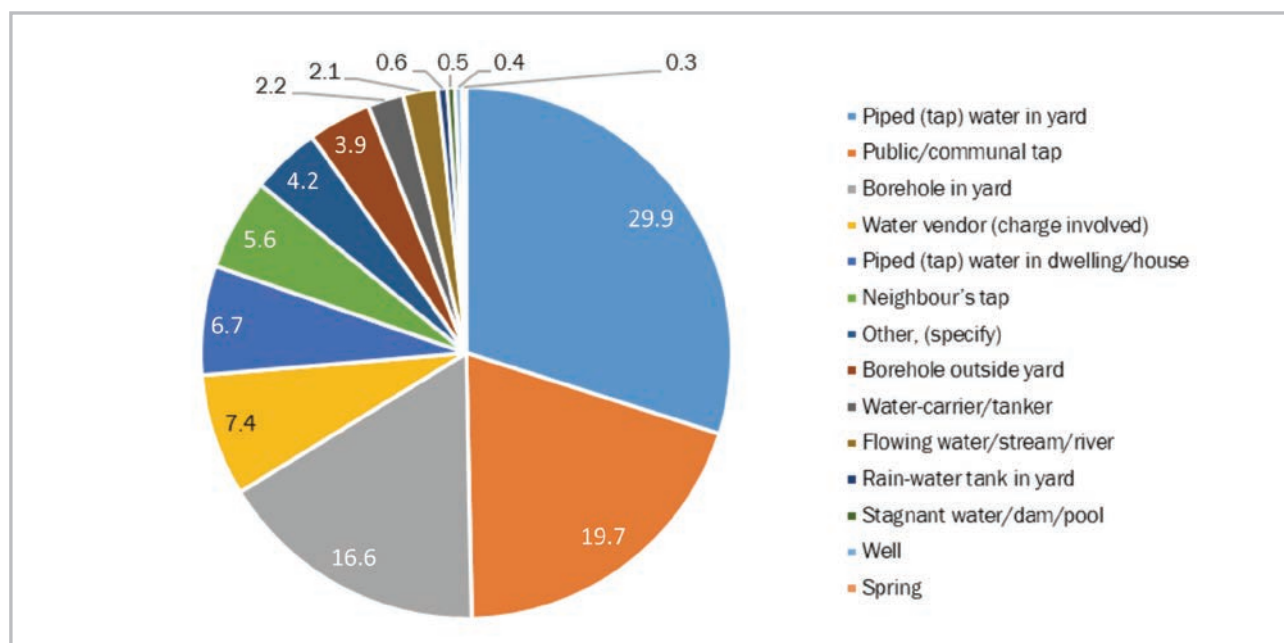


Figure 15: Households' main source of drinking water (n = 1851)

Most of the households that reported having tap water in their yards are headed by males (31.7 %), relative to females (28.3%). However, those that rely on communal taps (21% and 18.3 %) and boreholes in their yards (17.7% and 15.3%) are mainly headed by females and males, respectively (Table 24). The least of the households that depended, respectively, on stagnant water bodies (0.6% and 0.3%), wells (0.6% and 0.2%), and springs (0.4% and 0.2%) for drinking water were mostly headed by males compared to females.

Table 24: Households main source of water by sex of household head

Water sources	Household Head Sex				Total		
	Male		Female		%	95% CI	
	%	95% CI	%	95% CI			95% CI
Piped (tap) water in dwelling/house	7.3	[4.5-11.6]	6.1	[3.9 - 9.2]	6.6		[4.4-9.9]
Piped (tap) water in the yard	31.7	[26.1-37.9]	28.3	[22.9-34.5]	29.9		[24.8-35.6]
Borehole in the yard	15.3	[11.7-19.9]	17.7	[13.9-22.3]	16.6		[13.1-20.7]
Rain-water tank in the yard	0.3	[0.1-1.1]	0.8	[0.4 - 1.7]	0.6		[0.3-1.2]
Neighbour's tap	5.5	[3.8-7.8]	5.7	[4.3 - 7.5]	5.6		[4.3-7.3]
Public/communal tap	18.3	[14.4-23.0]	21	[16.7-26.1]	19.7		[16.0-24.1]
Water-carrier/tanker	2.1	[1.1-3.9]	2.2	[1.2 - 4.1]	2.2		[1.3-3.6]
Water vendor (charge involved)	7.7	[5.6-10.4]	7.2	[5.2 - 10.0]	7.4		[5.6-9.8]
Borehole outside yard	3.6	[2.2-5.9]	4.1	[2.5 - 6.5]	3.9		[2.5-5.8]
Flowing water/stream/river	2	[0.7-5.5]	2.2	[0.9-5.2]	2.1		[0.9-5.0]
Stagnant water/dam/pool	0.6	[0.2-1.7]	0.3	[0.1-1.5]	0.5		[0.2-1.1]
Well	0.6	[0.2-1.7]	0.2	[0.1-1.0]	0.4		[0.2-1.0]
Spring	0.4	[0.1-2.7]	0.2	[0.0-0.7]	0.3		[0.1-1.1]
Other	4.5	[3.1-6.6]	3.9	[2.7-5.7]	4.2		[3.0-5.8]
Total	100		100		100		
Number (n)	856		995		1,851		

The sources of water across the different districts vary. All four districts except for Sekhukhune predominantly have taps installed in their yards for water supply (Table 25). Among those, Waterberg (41.5%) had the highest proportion of households with taps installed in their yards, followed by Capricorn (39.4%) and, lastly, Sekhukhune (14.8%). In Sekhukhune, most households depend on communal taps (33.9%) to access drinking water (Table 25). Mopani District had the largest proportion of households with tap water in their dwelling (12.5%) and the Sekhukhune District had the least households (1.1%). Capricorn District led with the proportion of households that access water from boreholes (21.1%), followed by Sekhukhune (20.3%) and Vhembe District (15.6%).

Table 25: Households main source of water by district

Water source for drinking	Mopani	Vhembe %	Capricorn %	Waterberg %	Sekhukhune %	Total
Piped (tap) water in the yard	29.6	28.7	39.4	41.5	14.8	
Public/communal tap	16.1	20.0	11.5	17.2	33.9	
Piped (tap) water in dwelling/ house	12.4	3.6	8.5	8.8	1.1	
Borehole in the yard	9.8	15.6	21.1	15.3	20.3	
Other, (specify)	7.6	3.4	5.3	0.9	2.2	
Neighbour's tap	6.8	3.9	5.4	6.1	6.5	
Borehole outside yard	6.5	6.3	1.5	1.7	1.9	
Water vendor (charge involved)	6.3	8.1	3.9	4.7	13.3	
Water-carrier/tanker	1.5	1.0	2.6	2.1	3.9	
Flowing water/stream/river	1.2	7.1	0	0	0.2	
Stagnant water/dam/pool	1.2	0.7	0	0	0.2	
Rain-water tank in the yard	0.5	0.2	0.8	0	1.1	
Well	0.5	0.2	0	1.5	0.4	
Spring	0	0.9	0	0.3	0	
Total	100	100	100	100	100	
Number (n)	385	404	331	322	409	1851

5.3.2 Payment for water services

Among the 1 470 households, the majority (70%) of them were not paying for water services, whereas only 30% are paying (Table 26). This is also consistent across all 5 districts, namely: Mopani (70.9% vs. 29.1%), Vhembe (72.5% vs. 27.5%), Capricorn (75.5% vs. 26.5%), Waterberg (61.4% vs. 38.6%), and Sekhukhune (67.1% vs. 32.9%). Among households that pay for water supply, many of them were found in Waterberg (38.6%) which corresponds to Waterberg having the most percentage of households with taps installed in their yards that are billed for water supply. Most of the households that were paying were male-headed households (31%) as opposed to female-headed households (29%) (Table 26). Those that are not paying for water are mostly headed by females (71%), with males at 69%. This corresponds to the fact that male-headed households predominantly have taps in the yard or within the dwelling that are billed for water supply. Female-headed households rely mostly on water from public taps and boreholes that are free of charge.

Table 26: Payment of water services by sex and district

Province	Yes		No		Total	
	%	95% CI	%	95% CI	%	n
Total	30	[24.4-36.3]	70	[63.7-75.6]	100	1,470
Sex						
Male	31	[24.6-38.2]	69	[61.8-75.4]	100	691
Female	29	[23.2-35.7]	71	[64.3-76.8]	100	779

District						
Mopani	29.1	[18.6-42.4]	70.9	[57.6-81.4]	100	315
Vhembe	27.5	[16.8-41.5]	72.5	[58.5-83.2]	100	328
Capricorn	26.5	[15.4-41.6]	73.5	[58.4-84.6]	100	243
Waterberg	38.6	[25.5-53.5]	61.4	[46.5-74.5]	100	271
Sekhukhune	32.9	[21.1-47.5]	67.1	[52.5-78.9]	100	313

*CI Confidence Interval: Subtotals for the Province are not always equal due to non-response or missing data

5.4 Sanitation and Hygiene

Table 27 presents the type of toilet facilities used by households in Limpopo Province. Findings from the study indicate that less than 20% of the households use flush toilets. Among those households using flush toilets, 15.8% of the toilets were connected to a public sewerage system, and 3.5% were connected to a septic tank or conservancy system. Pit latrines with a ventilation pipe were the most common toilets used by households in the Limpopo Province, followed by pit latrines without a ventilation pipe. Less than 1% of households in the Limpopo Province practised open defecation. The results show no significant relationship between the gender of the head of the household and the type of toilet facility used by the household (Table 27).

Table 27: Type of toilet facility used by households

Type of Toilet Facility (n=1462)	Number (n)	Percentage (%)
Flush toilet connected to a public sewerage system	253	15.8
Flush toilet connected to a septic or conservancy tank	49	3.5
Pour flush toilet connected to a septic tank or septage pit	6	0.48
Pit latrine with a ventilation pipe	596	40.2
Pit latrine without a ventilation pipe	529	37.8
Bucket toilet	2	0.2
Open defecation	12	0.8
Others	15	1.0

In terms of the distribution of the types of toilets across the districts, Waterberg (39.9%) had the highest proportion of households using flush toilets connected to a public sewerage system, while Sekhukhune had the least (3.9%) (Table 28). However, with regards to pit latrines with ventilation, Sekhukhune leads (61.2%). The district with the highest proportion of households using pit latrines without ventilation was Vhembe (46.6%), followed by Capricorn (45%) and Mopani (34.3%). Types of toilet facilities used by households were further divided into improved and unimproved based on the definition of the WHO & UNICEF Joint Monitoring Programme (JMP) Ref: (WHO and UNICEF, 2017). Toilets that are considered as improved include those that are flushed or flushed to septic tanks, piped sewer systems, pit latrines, VIP latrines, and pit latrines with slabs. Meanwhile, unimproved restrooms consist of those with shared facilities or none (bush or field); flush toilets or pour-flush toilets that go elsewhere (not to septic tanks or pit latrines); pit latrines without slabs; bucket systems; and hanging toilets Ref: (WHO and UNICEF, 2017). The majority of the households (98%) in Limpopo were using improved sanitation facilities.

Table 28: Type of toilet facility used by the households by sex and district

Types of toilets (n=1462)	Sex		Total	District					Total
	Male	Females		Mopani	Vhembe	Capricorn	Waterberg	Sekhukhune	
	%	%		%	%	%	%	%	
Flush toilet connected to a public sewerage system	15.6	16.1	15.8	17.4	9.9	18.6	39.9	4.8	15.8
Flush toilet connected to a septic or conservancy tank	4.1	3	3.5	2.4	3.6	5.9	4	1.8	3.5
Pour flush toilet connected to a septic tank	0.3	0.6	0.5	1.3	0.3	0.4	0.4	0	0.5
Pit latrine with a ventilation pipe	41.5	39.1	40.3	42.3	38.1	28.8	26.7	61.2	40.3
Pit latrine without a ventilation pipe	36.8	38.9	37.9	34.3	46.6	45	26	29.4	37.9
Bucket toilet	0.4	0	0.2	0	0.6	0	0	0.3	0.2
Open defecation	0.3	1.3	0.8	0.6	0.9	0.5	1.9	0.6	0.8
Other	1	1.1	1	1.6	0	0.8	1.1	1.8	1
Total (n)	690	772	1,462	309	328	240	270	315	1,462

Figure 16 shows that in the study area, most of the households (70.4%) indicated that they received free sanitation services. However, about 30% of the households pay for sanitation services.

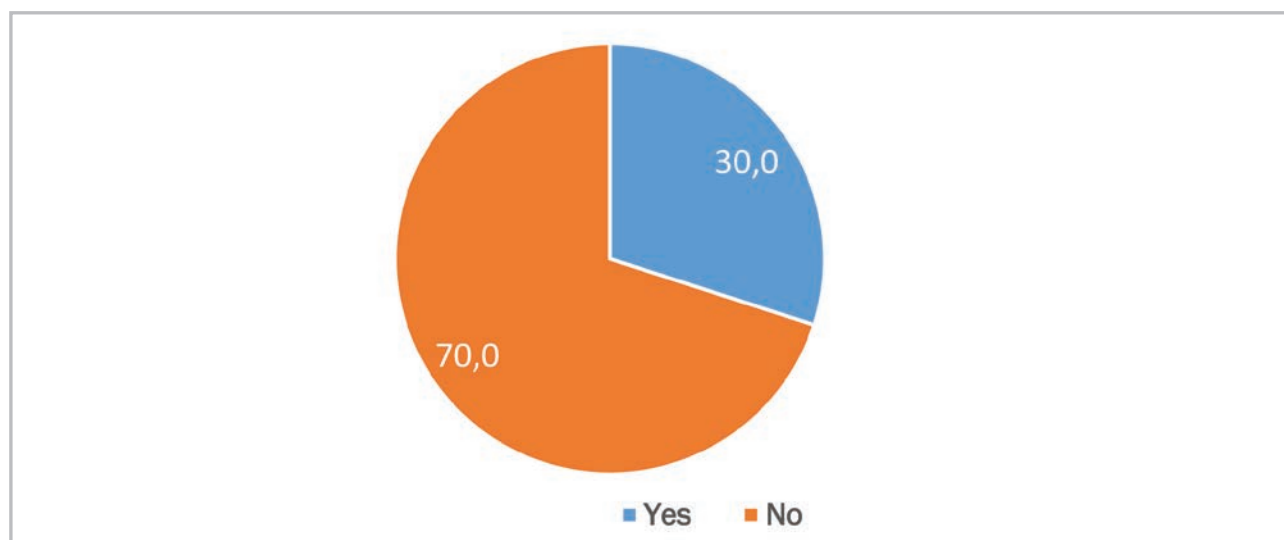


Figure 16: Payment for sanitation services (n=1470)

Sekhukhune has about 38% of households who accessed free sanitation services, followed by Mopani (20.8%) and Capricorn (20.3%) (Table 29). Vhembe had the least proportion of households receiving free sanitation services.

Table 29: Households receiving free sanitation by sex of the household head and district

	Yes		No		Don't know		Total	
	%	95% CI	%	95% CI	%	95% CI	%	n
Sex								
Male	21.9	[14.9-31.0]	71.8	[64.8-77.9]	6.3	[2.6-14.5]	100	114
Female	26.3	[17.1-38.1]	69.2	[55.8-80.0]	4.5	[1.5-12.6]	100	140
Total	24.2	[17.9-31.8]	70.4	[61.1-78.4]	5.4	[2.4-11.5]	100	254
District								
Mopani	20.8	[15.3-27.6]	79.2	[72.4-84.7]	0		100	50
Vhembe	9.2	[2.6-28.0]	87.6	[77.8-93.4]	3.2	[0.7-13.6]	100	32
Capricorn	20.3	[14.5-27.7]	72.5	[52.0-86.6]	7.2	[1.1-34.6]	100	45
Waterberg	36	[23.8-50.4]	53.5	[40.3-66.3]	10.5	[6.1-17.3]	100	114
Sekhukhune	38.5	[38.5-38.5]	61.5	[61.5-61.5]	0		100	13
Total	24.2	[17.9-31.8]	70.4	[61.1-78.4]	5.4	[2.4-11.5]	100	254

5.4.1 Refuse removal

Table 30 shows that more than two-thirds (67.6%) of the households used their own refuse dump to dispose of their rubbish. The local authority/private company removed about 7.7% of household rubbish at least once every week. The portion of households dumping their rubbish anywhere was 6.5%. Communal refuse dumps were used by 5.3% of the households (Table 31).

Table 30: Household rubbish disposal

Type of disposal (n=1808)	Number(n)	Percentage (%)
Removed by local authority/private company at least once a week	142	7.7
Removed by local authority/private company less often than once a week	32	1.7
Removed by community members, contracted by municipality at least once a week	135	6.3
Removed by community members, contracted by municipality less than once a week	3	0.1
Removed by community members at least once a week	1	0.0
Removed by community members, less often than once a week	1	0.1
Communal refuse dump	93	5.3
Communal container/central collection point	32	1.7
Own refuse dump	1,203	67.6
Dump or leave rubbish anywhere	120	6.5
Other	46	3.1

Compared with other districts of the province, Sekhukhune (81.9%) had the highest proportion of households using their own refuse dump (Table 31). Waterberg District (12.5 %) had the highest proportion of households that had rubbish collected at least once a week by the private or local authority, while Sekhukhune (2.7%) had the lowest. Vhembe leads with the proportion of households leaving rubbish anywhere (13.2%), followed by Waterberg (9.1%) and Sekhukhune (5.1%). Most households (75.3%) received free refuse removal services (Figure 17).

Table 31: Households rubbish disposal methods by district

	Mopani	Vhembe	Capricorn	Waterberg	Sekhukhune	Total
	%	%	%	%	%	%
Removed by local authority/private company at least once a week	10.2	4.3	11.4	12.5	2.7	7.7
Removed by local authority/private company less often than once a week	1.7	2.3	1.6	3.9	0.0	1.7
Removed by community members, contracted by municipality at least once a week	2.0	4.6	5.8	21.6	5.5	6.3
Removed by community members, contracted by municipality less than once a week	0.2	0.0	0.0	0.4	0.2	0.1
Removed by community members at least once a week	0.0	0.0	0.0	0.3	0.0	0.0
Removed by community members, less often than once a week	0.0	0.2	0.0	0.0	0.0	0.1
Communal refuse dump	9.6	3.4	6.4	4.1	2.8	5.3
Communal container/central collection point	1.1	1.9	2.0	4.0	0.2	1.7
Own refuse dump	69.7	69.0	62.4	43.8	81.9	67.6
Dump or leave rubbish anywhere	2.8	13.2	2.4	9.1	5.1	6.5
Other	2.7	1.0	8.1	0.3	1.5	3.0
Total (n)	373	400	328	307	400	1808

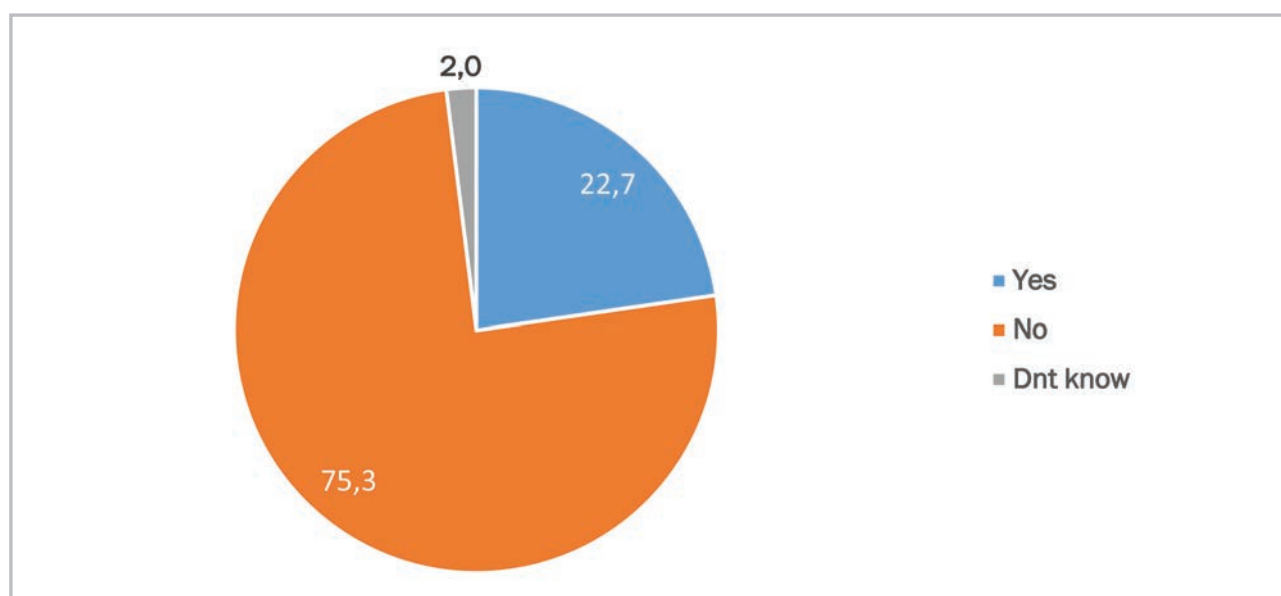


Figure 17: Proportion of households receiving free refuse removal services

5.5 Indigent Households

Figure 18 shows that 46.1% of households are registered as indigent. About 9.1% of the households did not know whether they were registered as indigent. Vhembe District (72.9%) had the highest proportion of households registered as indigent, followed by Waterberg (59.8%), Sekhukhune (39.3%), and Mopani (39.4%) (Table 32). Capricorn District (21.9%) had the lowest proportion of the households registered as indigent.

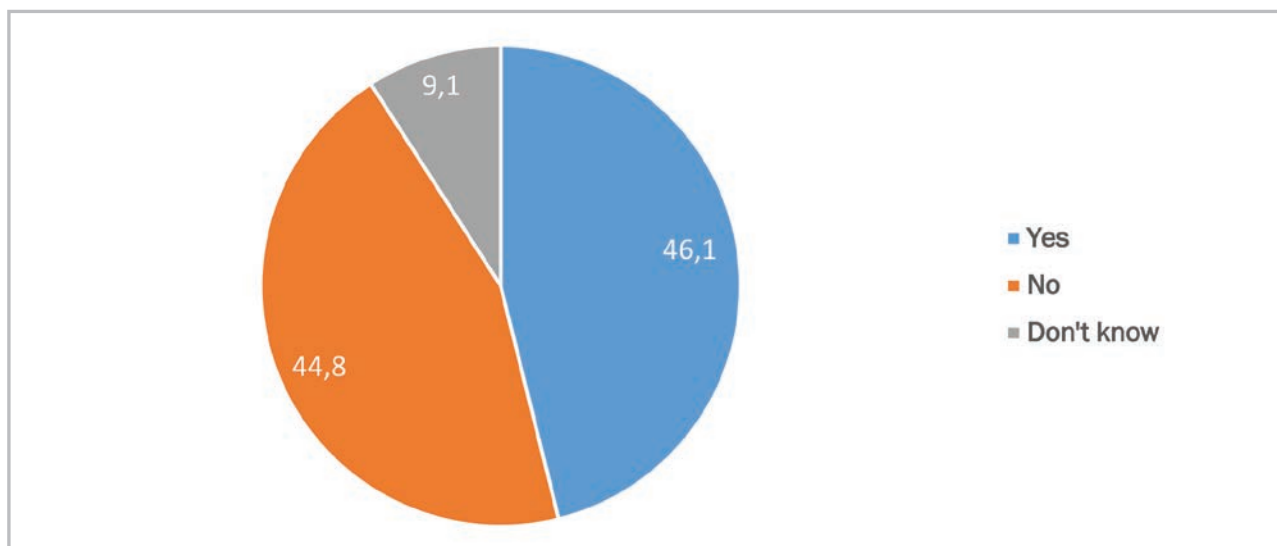


Figure 18: Proportion of households registered as indigent

Table 32: Households registered as indigent by sex and district

	Yes		No		Don't know		Total	
	%	95% CI	%	95% CI	%	95% CI	%	n
Sex								
Male	45.9	[39.3-52.6]	44.9	[38.5-51.4]	9.2	[7.0-12.1]	100.0	851
Female	46.3	[39.7-53.0]	44.7	[38.3-51.3]	9.0	[6.8-11.9]	100.0	995
Total	46.1	[40.0-52.4]	44.8	[38.9-50.8]	9.1	[7.2-11.5]	100.0	1.846
District								
Mopani	39.4	[34.3-44.8]	47.4	[41.5-53.5]	13.1	[9.5-17.9]	100.0	383
Vhembe	72.9	[59.1-83.4]	19.2	[11.6-29.9]	7.9	[4.3-14.2]	100.0	404
Capricorn	21.9	[16.2-29.1]	65.9	[55.9-74.6]	12.2	[7.5-19.1]	100.0	329
Waterberg	59.8	[46.2-72.1]	32.5	[22.2-44.9]	7.6	[4.9-11.7]	100.0	322
Sekhukhune	39.3	[25.6-55.0]	56.9	[41.0-71.5]	3.8	[2.1-6.8]	100.0	408
Total	46.1	[40.0-52.4]	44.8	[38.9-50.8]	9.1	[7.2-11.5]	100.0	1.846

*CI Confidence Interval: Subtotals for the Province are not always equal due to non-response or missing data

This section focuses on the food availability dimension of food security, and aims to unpack the extent to which households in the province ensure food security through their production activities. Most households in the African context rely on agriculture as the primary source of food, hence they engage in crop and livestock production to provide food for their households. This section will characterize land ownership and access, and agriculture production trends across the different districts.

6.1 Agricultural Production and Seasonality

Findings from the HEA focus group discussions indicate that agricultural production and value chains have a critical role to play in household food and nutrition security. Figure 19 depicts a seasonal calendar in which farming in Limpopo Province has two main seasons, namely: the rain season (September to February) characterised by land preparation, planting, and weeding; and the dry season, which stretches from March to June and is characterised by harvesting of crops and vegetables. Major crops reported to be commonly grown include cereals (maize, sorghum, and millet) and vegetables. Fruit production and harvesting also play a significant role in contributing to household food security in this province. Production of fruits include oranges, naartjies, and avocados. The land for maize cropping is prepared in late winter and spring, with ploughing and planting taking place from September to January, depending on the timing of the rains. Weeding (a period of intense activity and one in which work opportunities increase) takes place from November to February, with the dry harvest (another period for employment) beginning in March. Vegetable farming is stretched out longer and vegetables are planted more continuously, to bring a steady income. Land preparation takes place through autumn, winter, and spring up to September, with planting at the same time. Crops and fields are tended and weeded through the same season up until October, by which time harvesting is completed. The peak period for casual work availability is from November to February, while off-farm work is also available during winter from May to August. Livestock sales tend to peak in winter, from May to July and in spring or early summer, from October to January. The latter is often to pay for summer expenses such as the Christmas holiday season. This brief seasonal calendar shows some of the strategies which households use to obtain food and income. It also shows the critical months in which households do not have alternative options for obtaining food and income in the study area.

Activity	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Dry harvest & threshing												
Land preparation (maize)												
Land preparation (Vegetables)												
Ploughing & planting (maize)												
Ploughing & planting (Vegetables)												
Weeding (maize)												
Weeding (Vegetables)												
Harvesting (vegetables)												
Casual Labour (domestic work, crop fields, herding & public works)												
Off-Farm Employment												
Livestock sales												
Purchases												

Figure 19: Seasonal calendar (Source: HEA, Qualitative Output)

6.1.1 Household access to land

South Africa has a dual system when it comes to land rights i.e., statutory law vested in the Constitution and customary law vested mostly in patrilineal tribal traditions and customs (Toulmin, 2008). Limpopo Province is predominantly rural, hence most of the land is held under customary law, and this has eased access to land for most households since the land held by traditional authorities is cheaper and easily accessible (Figures 20-22).

Overall, access to land by households in Limpopo Province is very limited (see Figure 20). Capricorn District has the highest percentage (over 80%) of households with limited access to land, with a relatively similar trend emerging in Sekhukhune District (above 70%). This is largely because these districts have urban and peri-urban settings in which land is primarily set aside for purposes of a dwelling other than for agriculture purposes. In Limpopo Province, the district with the highest percentage of access to land is Mopani (56%), followed by the Vhembe District (43%). Waterberg district is the most urbanised district in Limpopo Province; hence households have the lowest percentage of access to land, with only 18%.

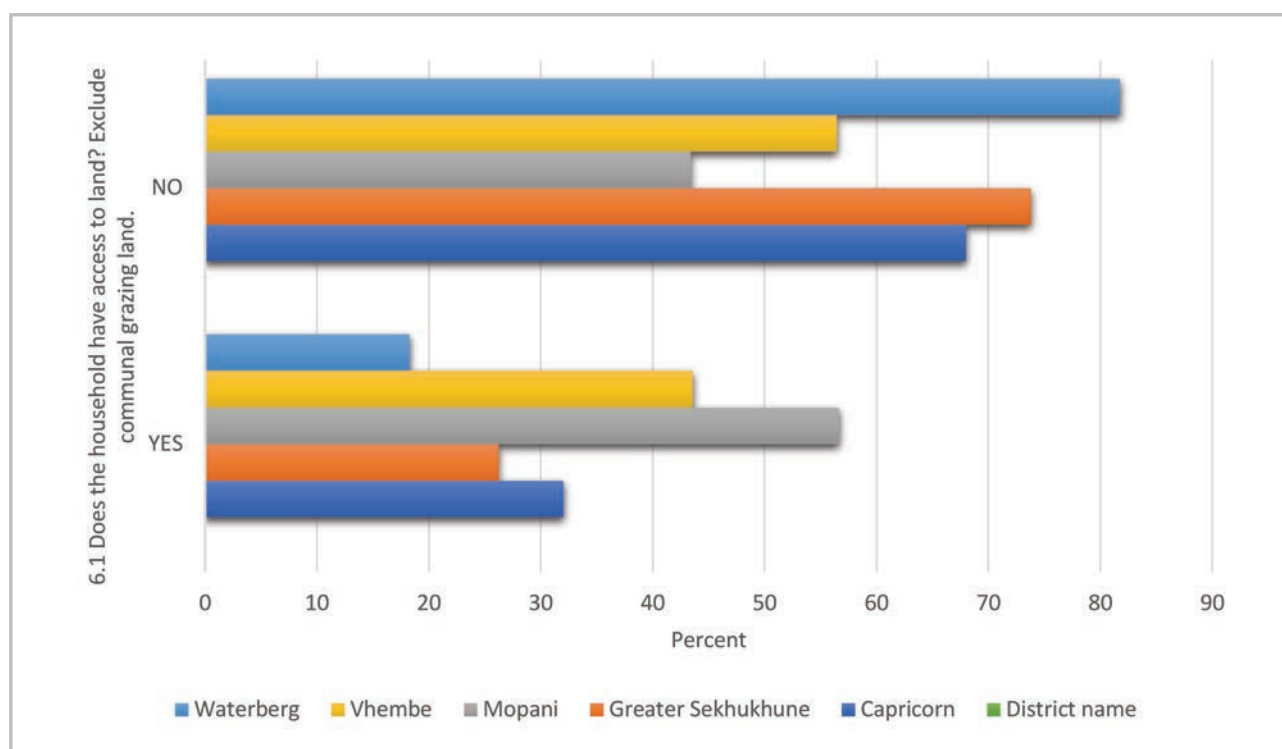


Figure 20: Household access to land

Disaggregated by gender, both female and male headed households were not accessing land. However, this is more pronounced among females in all the districts, especially Waterberg, Sekhukhune, and Capricorn districts. This calls for the empowerment of women, through increased land access and ownership for agricultural purposes, which eventually improves household food availability and consumption.

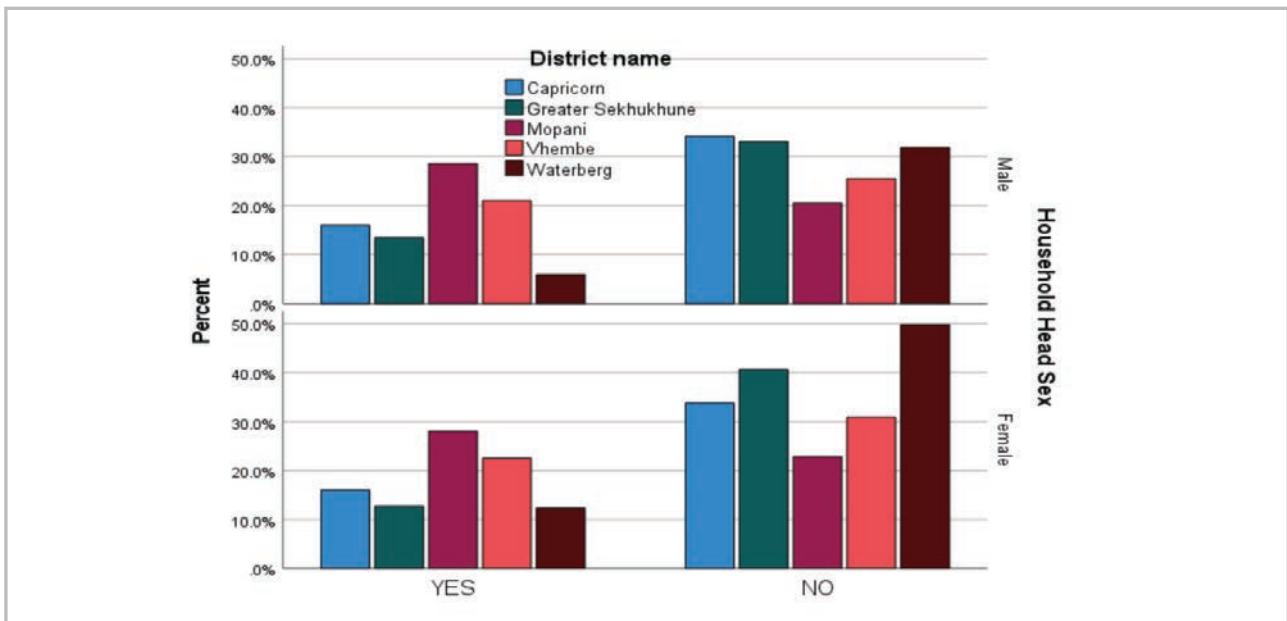


Figure 21: Land access disaggregated according to household head sex

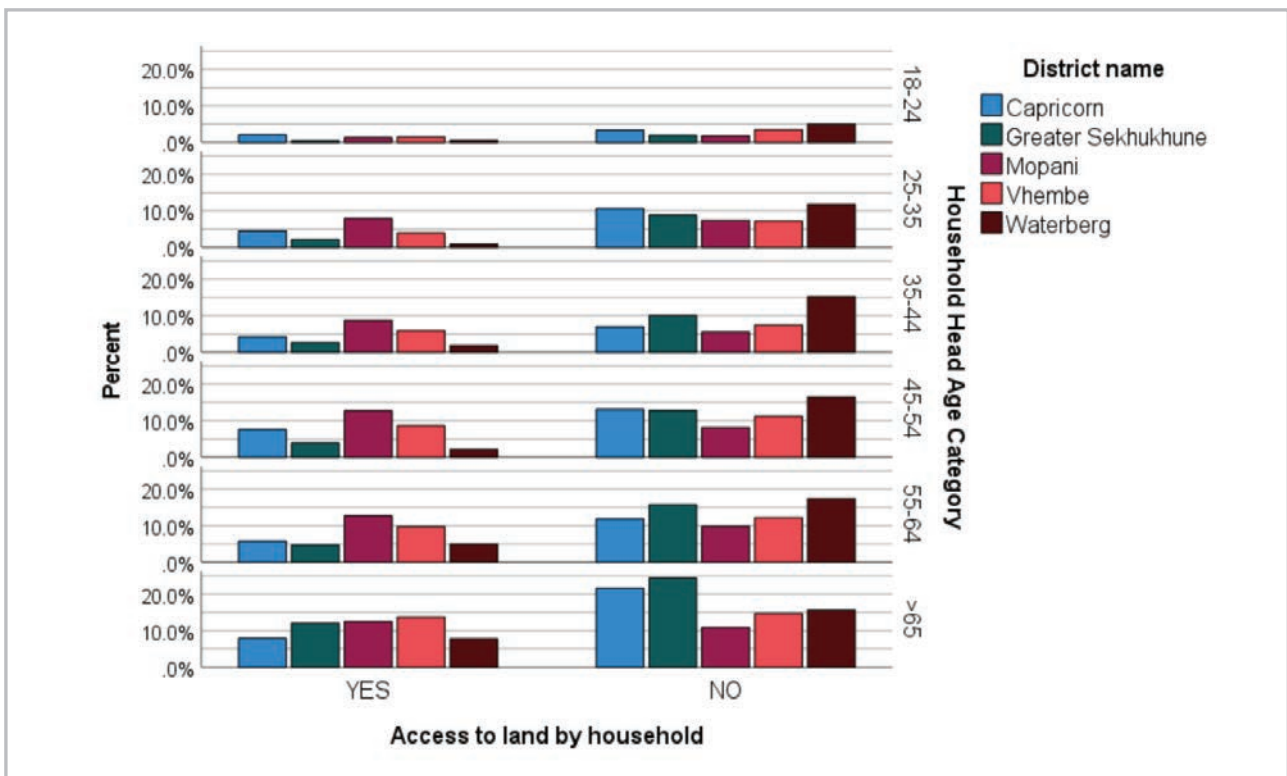


Figure 22: Access to land disaggregated according to age

Land access varied disproportionately according to the different age categories, as shown in Figure 22. Most respondents in the 16-24 years age category have very limited access to land and across the five districts, only less than 5% reported to have access to land. As expected, access to land increased with an increase in age; for the youthful age of 18 years to about 35 years, access to land is very limited, with the maximum being about 8% only in Mopani District. With the increasing levels of unemployment, it is prudent for the government to target land apportionment to the youthful age group for agricultural projects that generate income and produce food.

6.1.2 Land tenure system

Results from the household survey show that of the limited land that they access, most of it is owned by the households (Figure 23), with households in Sekhukhune and Vhembe districts at 95% and 93%, respectively. However, land owned in this context includes land that households communally and privately own. The size of the land owned is very small, it ranges from zero to a quarter of a hectare (0–0.25ha), as reported from the HEA focus group discussions held within the province. This result indicates that the majority of the reported landowners were merely for residential purposes, and the land was not enough for agriculture production purposes. There is, however, a small percentage of households who reside on land which is owned by the tribal authorities, and Capricorn District had the highest with 10%, followed by Waterberg and then Vhembe districts. Ownership of the land in this context is mainly small areas for dwelling, with very limited backyard farming or gardening.

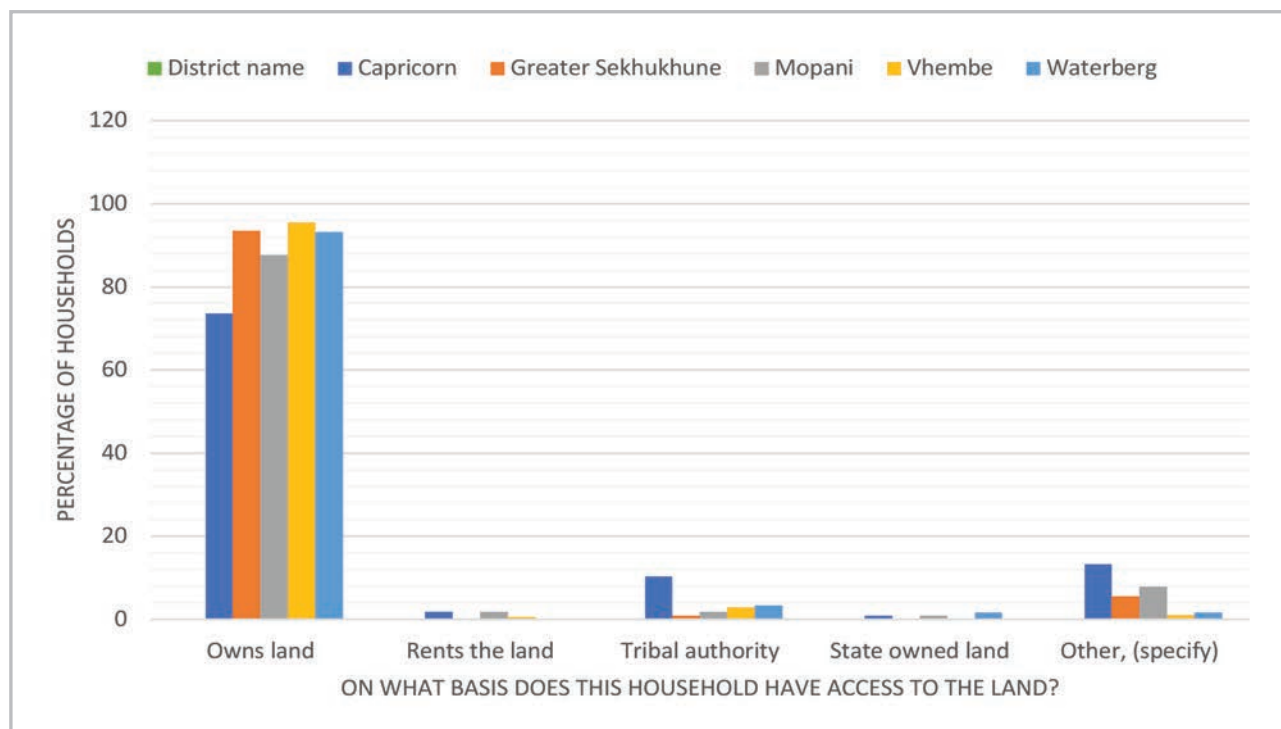


Figure 23: Land tenure in Limpopo Province

NB: Land owned in this context includes land that is communally and privately owned

6.1.3 Use of land for food production or other agricultural products

Within the province, at least 70% of the households use the land for food production and other agricultural products. However, the majority of households' average land size allocated for agriculture production is very small, as reported from HEA focus group discussions, with less than a quarter hectare (0–0.25ha). Some households had about 3 to 5 hectares of land, which was reported as the largest land size cultivated. Therefore, for most households, the land that was regarded as 'owned' was primarily meant for residential purposes, with very limited backyard farming. It should be noted that Limpopo is widely rural, and most rural communities in South Africa practise subsistence farming, hence the higher number of usages of land for food production.

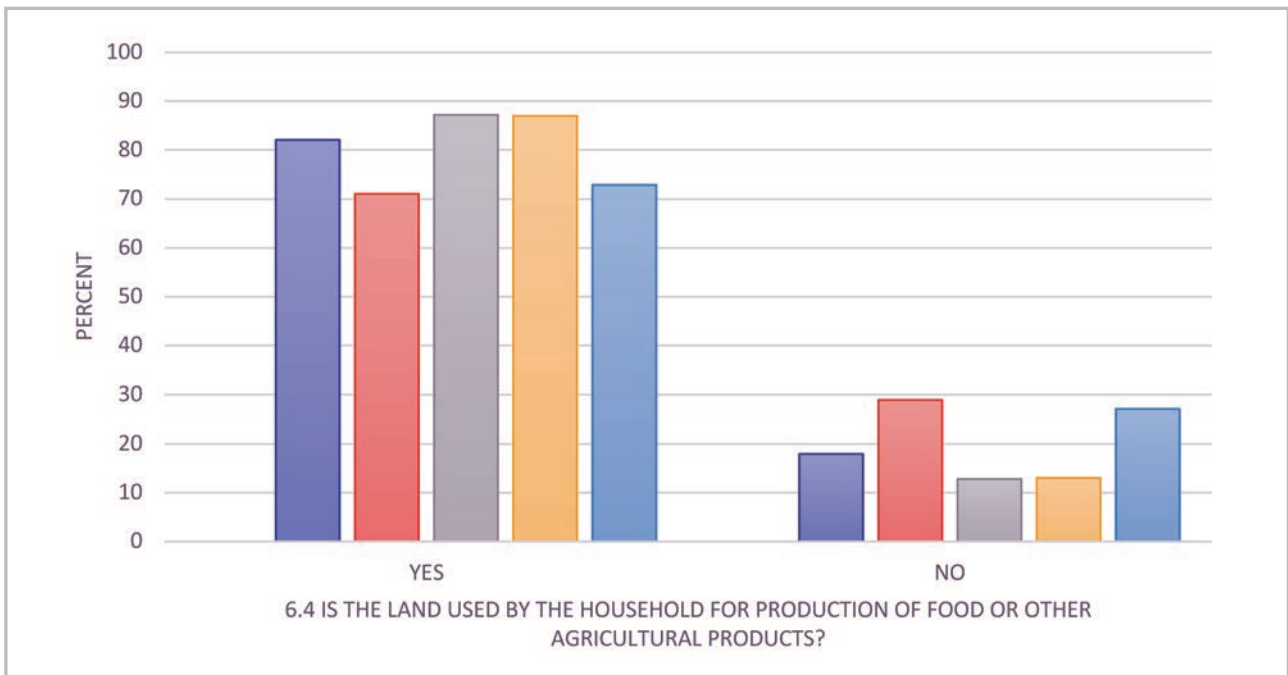


Figure 24: Land use for food and other agricultural production

6.1.4 Crop and livestock production

Livestock production is commonly practised in Sekhukhune District by about 43% of the households, and the least reported level of livestock producing households are in Vhembe District. Capricorn District also reported a relatively higher percentage of households practising livestock production. However, in the Limpopo Province, most households reported that they are not involved in livestock production, especially in Vhembe, Mopani, and Capricorn districts. Vhembe District is traditionally a fruit and vegetable production district, with very limited livestock farming, as reflected from the findings in Figure 24.

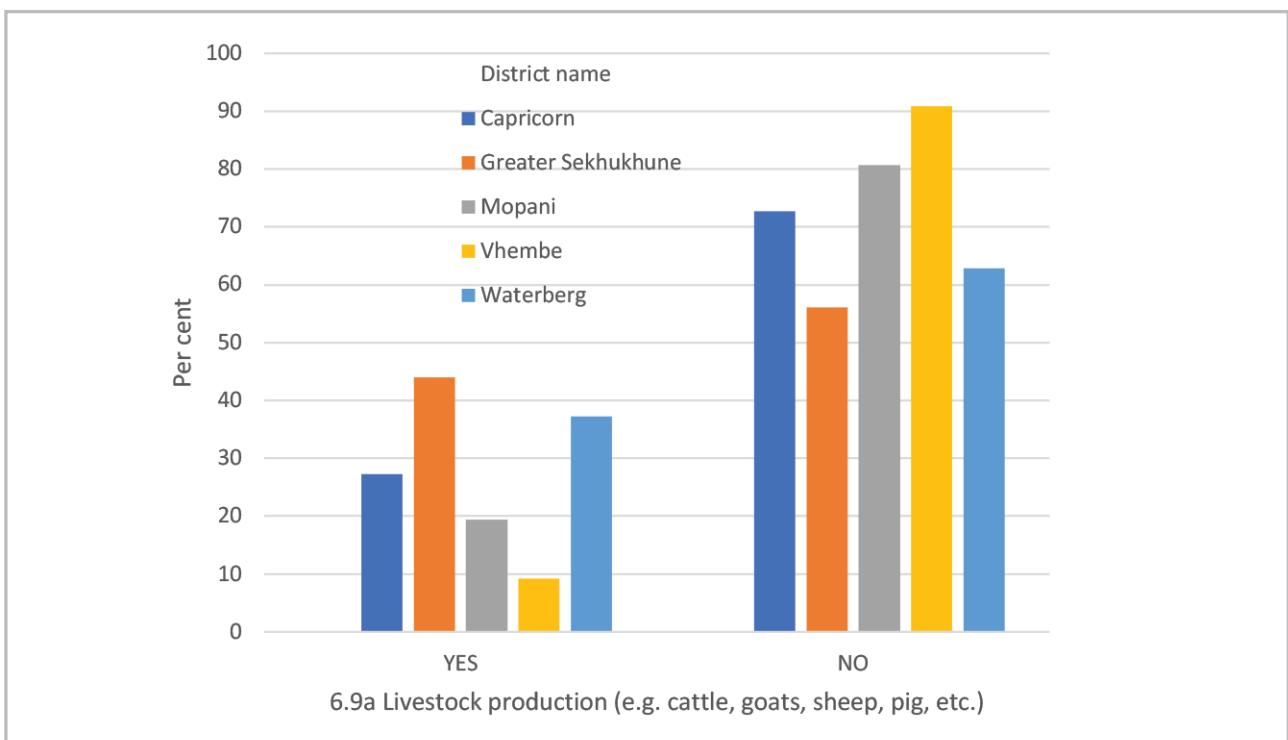


Figure 25: Livestock production by district

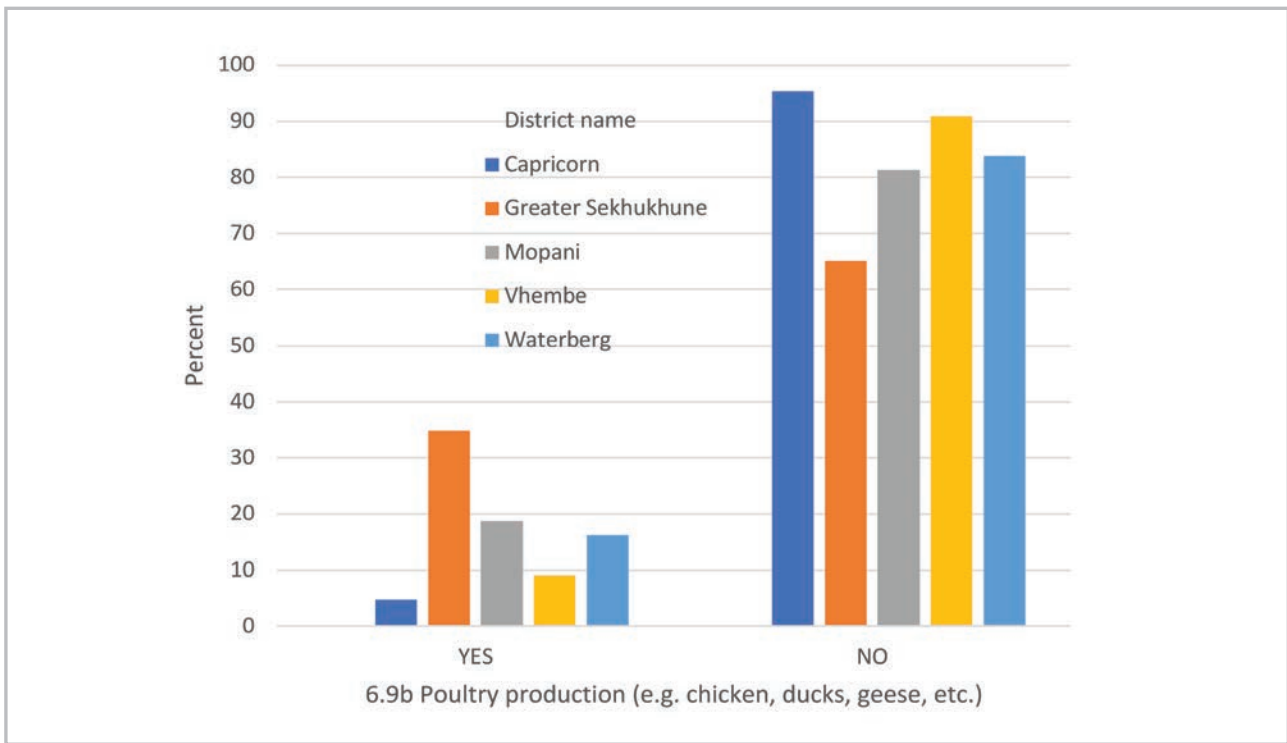


Figure 26: Poultry production by district

Generally, poultry production is not practised by the majority of the households in Limpopo Province. The results indicated that over 90% of the households in the Capricorn and Vhembe districts were not involved in poultry enterprises. Sekhukhune District is a relatively semi-arid region which is ideal for livestock farming, including poultry. Poultry production was also reported to be relatively better among households in Sekhukhune District, with about 35% of households. The least level of poultry production was reported in Capricorn District, with almost 5% of the households engaged in the enterprise.

Households in the Limpopo Province reported a high percentage of engagement in crop production, with almost over 70% of all the five districts reporting active participation in cropping (Figure 27). Vhembe District reported about 75% of households being involved in the production of maize, sorghum, millet and wheat. This is in line with the agro-ecological conditions in Vhembe District which receives aboveaverage rainfalls and good edaphic characteristics that support crop production. Mopani and Waterberg districts had the same percentage (70%) of households involved in the cropping of cereals. Vhembe District reported the least percentage of households (25%) who do not practise cereal farming. Sekhukhune, Mopani, and Waterberg districts had almost the same percentage of households who are not engaged in cereal production, primarily because of the arid conditions experienced in these districts where crop failure is common due to intermittent droughts.

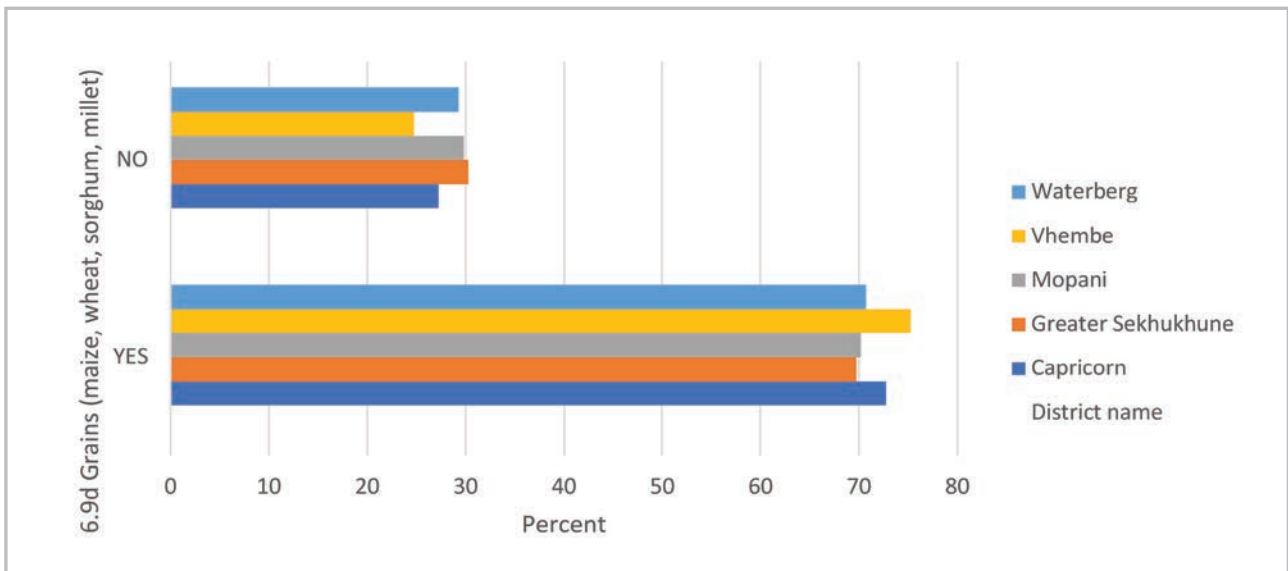


Figure 27: Household involvement in crop production

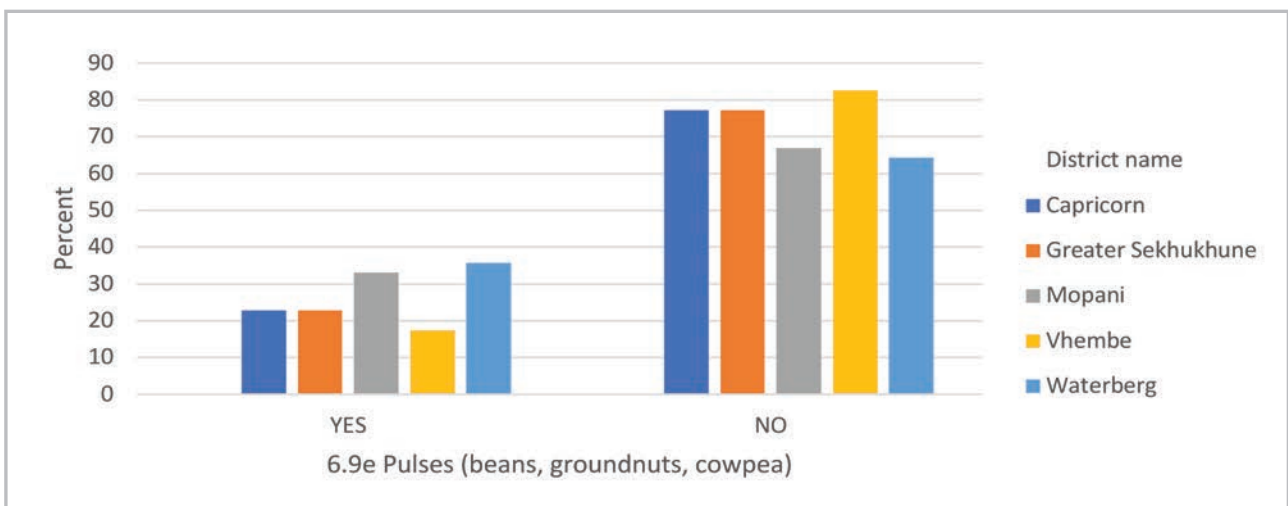


Figure 28: Pulses Production by district in Limpopo Province

The production of pulses was least reported to be practised by most households in the Limpopo Province, with all the five districts reporting more than 60% (Figure 28). More than 80% of the households in Vhembe District do not produce pulses and 78% of the households in Sekhukhune and Capricorn districts also reported not be engaged in the production of pulses. However, about 35% of the households in Waterberg District engage in the production of pulses (cow pea, groundnuts, and beans) and, similarly, more than 30% of households in Mopani District reported the same. Pulses thrive well in poor soil fertility conditions and poor rainfall areas such as Mopani District, hence the relatively high percentage of producers of pulses in Mopani District.

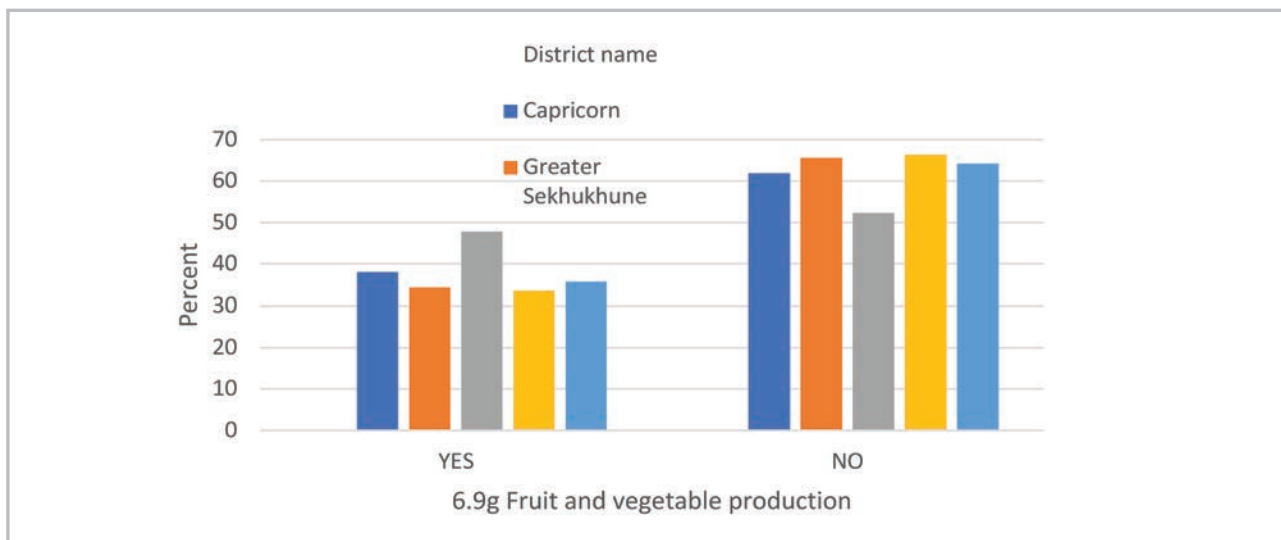


Figure 29: Household fruit production

Fruit and vegetable production was reported to be high (48%) in Mopani District (Figure 29). Typically the dynamics on the ground since, in places like Tzaneen, there is high production of fruits such as avocados, pineapple, oranges, etc. All the districts had above 30% reported engagement in fruit and vegetable production. These results were similar to those emerging from the HEA focus group discussions in which the seasonal calendar showed that in the Limpopo Province, dominant fruit produced were avocados, oranges, and pineapples being dominantly produced. More than 60% of the households in Vhembe, Capricorn, Sekhukhune, and Waterberg districts reported that they were not engaged in fruit and vegetable production. This is primarily because there is the scarcity of water.

6.1.5 Major Crops Grown

This section presents major crops and fruits grown in the five districts in the Limpopo Province.

Table 33: Major crops and fruits grown in Limpopo Province

	Mopani	Vhembe	Capricorn	Waterberg	Sekhu-khune	n
	%	%	%	%	%	
Maize	26.38	37.69	25.92	3.19	6.84	591
Cabbage	28.93	47.14	9.39	14.53	0	28
Spinach	36.42	28.42	21.75	5.29	8.12	147
Groundnut	59.34	24.53	8.83	4.70	2.61	99
Cowpeas	57.62	0	30.65	3.88	7.84	33
Beetroot	24.66	29.90	24.27	5.19	15.99	36
Onions	26.15	49.67	10.94	2.71	10.52	43
Pumpkins	36.88	24.36	34.41	1.95	2.40	34
Orange	15.02	60.40	19.37	2.64	2.56	64
Mangos	40.23	38.52	17.44	2.04	1.77	144
Naartjies	27.91	60.57	5.61	3.37	2.54	36

Table 33 depicts the major crops and fruits that are grown in the Limpopo Province. Vhembe District is the main district in which maize is produced (38%), whilst Waterberg and Sekhukhune districts, were the least maize farming districts (Table 33). This corroborates the observations made in these districts where the rainfall patterns and soil fertility characteristics are suitable for maize production in Vhembe District, contrary to the conditions in Waterberg and Sekhukhune districts, where relatively dry conditions and poor soil fertility are common. The table also shows that pulses were mainly grown in Mopani District - groundnuts (59.34%) and cowpeas (57%).

6.2 Wealth breakdown, food, and income sources

Results emerging from the HEA focus group discussions indicate that 40% of the households in the Limpopo Province are poor, and 25% are very poor. This result is a cause for concern with regards to government interventions that need to be tailor-made for this province. Wealth breakdown is the process by which people within a livelihood zone are grouped together using local definitions of wealth and the quantification of their assets. The wealth breakdowns are used to identify the poorest households or those that are most vulnerable to projected shocks. Criteria was generated by communities and thus locally relevant sources of information on vulnerability. The level of division depended on how the community viewed their society, and the purpose of the analysis. The wealth group, in this case, is a group of households within the same community who share similar capacities to exploit the different food and income options within a particular livelihood zone. It disaggregated the population into common 'access' groups, which allowed researchers to see important differences in households' vulnerabilities to different shocks and to estimate the numbers of people who will be affected by different changes.

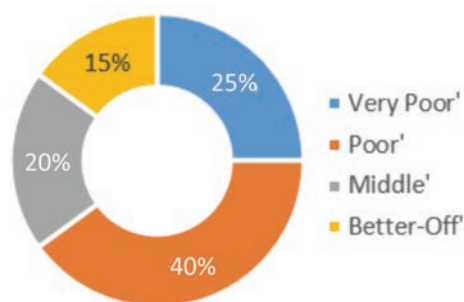
The analysis showed that geography plays a critical role in determining a household's options for obtaining food and income in a society. However, it is not the only factor that determines the pattern of livelihood. While geography tends to define a household's options for obtaining food and income, the ability to exploit those options and to survive in a crisis is determined largely by wealth. In other words, what people have by way of land, capital, and livestock, together with their educational status and access to political and social networks, determines the ways in which they are able to get food and cash, as well as the ways in which they will respond to sudden or long-term change.

This section provides the analysis of wealth, food, and income sources in the three livelihood zones in the province. The analysis focused on factors that determine how well-off community members might be, based on prevailing livelihood assets. The wealth breakdown is the analysis which entails grouping households based on wealth and assets. The investigation of differences between households is central to building a meaningful analysis of food security and vulnerability to different hazards.

6.2.1 Lowveld Open Access Irrigated Cropping Livelihood Zone (ZALOI) of Vhembe and Mopani

Wealth in this area is determined by four factors:

1. Employment, a product of education, and good social connections;
2. Ownership of a business, such as a spaza shop or bakkie or taxi;
3. Land holding; and
4. Household livestock ownership.



Category	Item	Wealth Group (typical value in brackets)			
		'Very poor'	'Poor'	'Middle'	'Better off'
Hh Size		4-10 (6)	4-9 (6)	3-5 (4)	3-5 (4)
Land (Ha)	Owned	0-1 (¼)	¼-1 (0.7)	1-3 (1½)	2-5 (3)
	Cultivated	0-1 (0.2)	¼-1 (½)	1-3 (1.3)	2-5 (3)
Livestock (head)	Cattle	0-3 (1)	4-12 (8)	9-21 (15)	20-200 (120)
	Goats	2-4 (6)	4-10 (7)	15-20 (18)	21-100 (60)
Income	Main	Grants	Grants	Formal employ	Formal employ
	Annual (R)	38,669	67,525	669,418	1,726,245

Figure 30: Wealth breakdown in the Lowveld Open Access Irrigated Cropping Livelihood Zone (ZALO)

People’s options for obtaining food and cash income are determined to a great extent by where they live. In Limpopo Province, for example, households in the dry lowveld region where the agro-ecology is suited more to livestock production will have very different livelihood options to those in the wetter mid- and highveld areas which favour agriculture. But it is not just agro-ecology which determines livelihood patterns – it is also access to markets. Most households obtain over 60% of their food and non-food needs through purchases. Market access also affects the ability of people to sell their production (crops or livestock or other items) and the price they obtain for these goods. Thus, households with good access to the urban complex of Polokwane, Tzaneen, and Giyani municipalities have quite different options to those living in the rural areas. The results showed a high probability of food insecurity amongst ‘very poor’ and ‘poor’ households in the province. The COVID-19 lock downs reduced households access to food and income.

The wealthiest households, described as the ‘better-off’, are those with permanent work and a salary of R18,000 per month or more. Some have businesses and their annual income is beyond R700,000. Households that have lower-paying or less permanent work, which when averaged over the year is approximately R15,000 per month, are referred to as the ‘middle’ – as well as some who own small to medium scale businesses which generate less than R600,00 per year. Those who depend primarily on grants are described as the ‘poor’ and ‘very poor’; collectively, they are almost four-fifths of households. The ‘very poor’ and ‘poor’ supplement their grant income from casual labour and other sources. Land in this zone is good for farming and the population density is high, resulting in pressure on what is a finite resource. Households with more wealth are thus able to secure more land and cultivate farms that are up to fifteen times larger than those of the poorest households. Livestock holdings also increase substantially with wealth. Cattle are considered more as determinants of wealth; wealthier households do keep them, while they may not keep any small stock - although on average, they do keep more goats than poorer households.

6.2.2 Northern Open Access Cattle and Dryland Crops Livelihood Zone (ZANOC) of Waterberg and Capricorn

Wealth in this livelihood zone is determined primarily by three factors:

1. Employment, a product of education, and good social connections;
2. Ownership of a business, such as a spaza shop or bakkie or taxi; and
3. Livestock ownership, especially cattle.

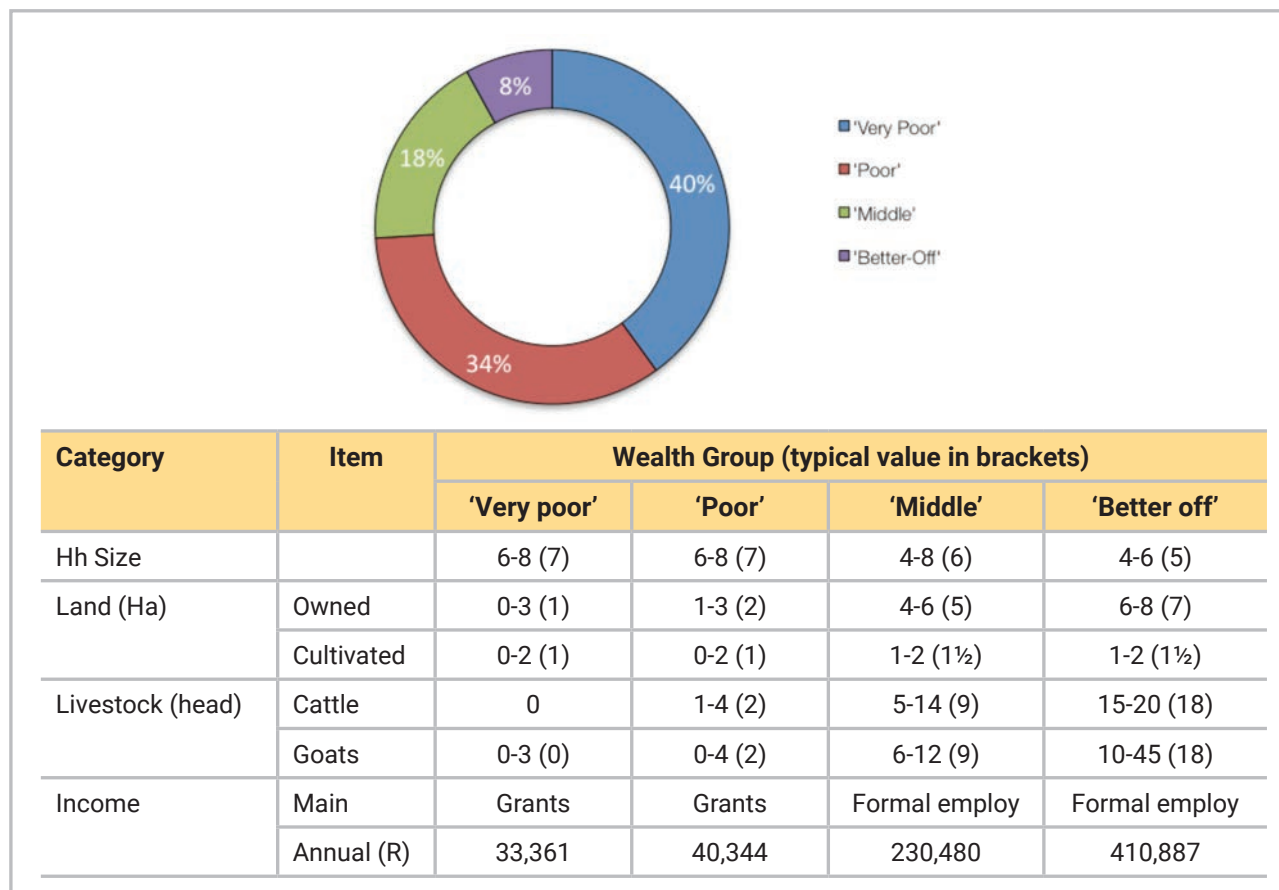


Figure 31: Wealth breakdown in the Northern Open Access Cattle and Dry Land Crops Livelihood Zone (ZANOC)

The wealthiest households, described as the 'better-off', are those with permanent work and a salary of R9,000 to R30,000 a month. Households that have lower-paying or less permanent work, which on average over the year is R4,000 to R9,000 per month, are referred to as the 'middle'. Those who depend primarily on grants are described as the 'poor' and 'very poor'; collectively, they are almost three-quarters of households. The 'very poor' and 'poor' supplement their grant income from casual labour and other sources.

Wealthier households do cultivate somewhat larger farms (about 50% more by area) but differences are not substantial. As households begin with the same size stands, land ownership is only slightly skewed.

This zone is distinguished by the larger herds of small stock, especially goats, than elsewhere. This follows from the drier climate and bushier environment that is better suited to these animals. Key informants in the communities estimated larger household sizes, so field teams recorded values in excess of those reported in other surveys, especially the census. Except for single people, the most frequent household size in this zone is four, while the greatest number of people reside in a household of five. They, however, reported a typical household size of 5-6 people, which is used in ensuing sources of food and income - these can be scaled to the appropriate household size from the census.

6.2.3 North Eastern Limpopo Open Access Farming (ZALOF) of Mutale, Thulamela, and Makhado

Wealth in this livelihood zone is determined by four factors:

1. Employment, a product education, and good social connections;
2. Ownership of a business, such as a spaza shop or bakkie or taxi;
3. Land holding; and
4. Livestock ownership, especially cattle.

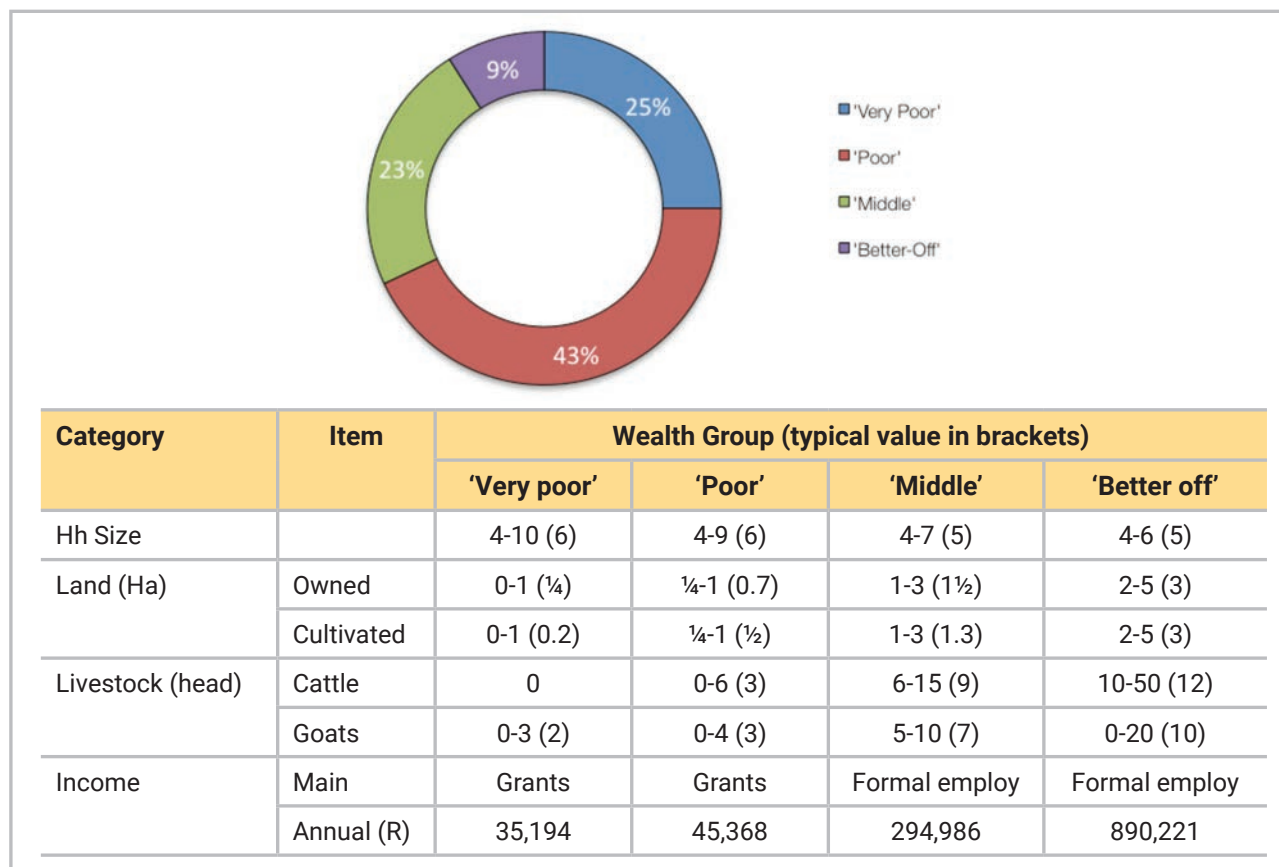


Figure 32: Wealth breakdown in the North Eastern Limpopo Open Access Farming Livelihood Zone (ZALOF)

The wealthiest households, described as the 'better-off', are those with permanent work and a salary of R70,000 per month or more. Households that have lower-paying or less permanent work, which when averaged over the year is approximately R22,000 per month, are referred to as the 'middle' (Figure 32). Those who depend primarily on grants are described as the 'poor' and 'very poor'; collectively, they are almost four-fifths of households. The 'very poor' and 'poor' supplement their grant income from casual labour and other sources.

Land in this zone is good for farming and the population density is high, resulting in pressure on what is a finite resource. Households with more wealth are thus able to secure more land and cultivate farms that are up to fifteen times larger than those of the poorest households.

Livestock holdings also increase substantially with wealth. Cattle are considered more as determinants of wealth; wealthier households do keep them, while they may not keep any small stock - although on average, they do keep more goats than poorer households.

6.2.4 Source of food in ZALOI Zone of Mopani and Vhembe districts

Sources of food are expressed in terms of contribution to the minimum human food energy needs, which is 8,800 kJ/person/day. Wealthier households may consume considerably more than this, for example 12,144 kJ/person/day, which is 138% of minimum food needs. Some of this consumption may be wasted, for example

when food is thrown away or incompletely eaten. Even the poorest households may consume slightly more than the minimum requirement, for example 111%, or 9,768 kJ/person/day. Crop production contributed to 29% and 33% of the food sources for the very poor and poor wealth groups. Food purchases contributed about 60% and 62% of the food needs for the middle and better-off households. Despite the good rainfall and fertile soils, purchases still made up a significant portion of people's sources of food. The contribution to food energy from non-staple food purchase increased steadily from 4% for the 'very poor' to 26% for the 'better-off'. The very poor and poor households also accessed food from payment in kind from the better-off wealth groups. The 'very poor' and 'poor' households could hardly cover their basic food and livelihoods needs in normal times, leaving little financial ability to invest in their children's needs, such as education. About 40% and 57% of the very poor and poor households' food needs were drastically affected by COVID-19 restrictions, leaving them vulnerable to food insecurity.

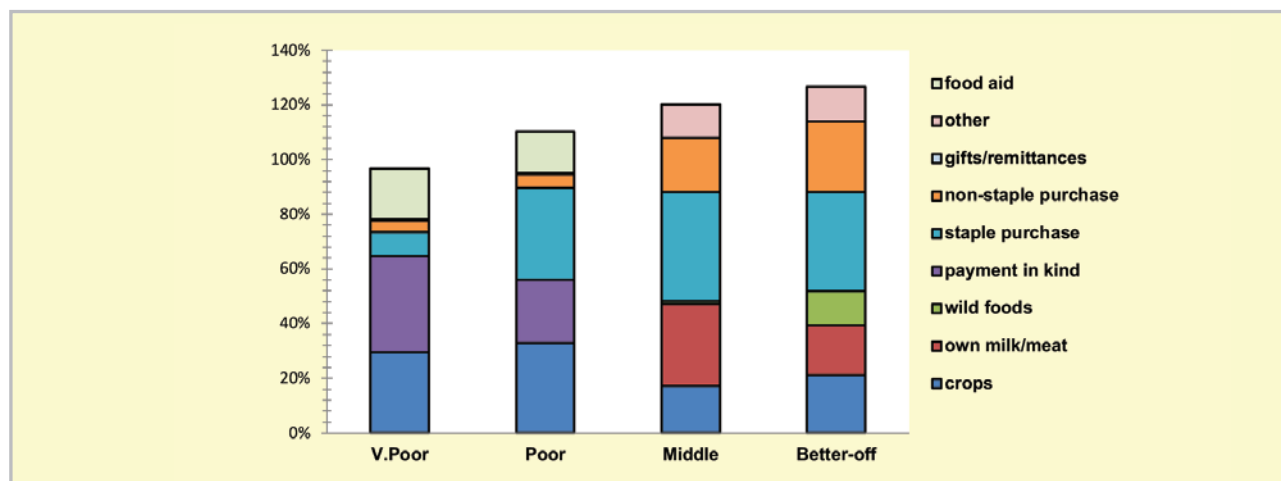


Figure 33: Sources of food (expressed as percentage of minimum average food energy needs) for each wealth group (Source: HEA, Qualitative Output)

Crop yields in the zone are low, given the fertility and land capability - 'very poor' and 'poor' households obtain only 800 kg/Ha, this rose to 1,200 kg/Ha for the 'middle' and 1,800 kg/Ha for the 'better-off'. Wealthier households have capital for inputs and hired labour, ensuring their crops are planted and weeded in time as well as being protected from pests.

'Middle' and 'better-off' households obtained a tiny proportion of their needs from their livestock; this was usually from cow milk and occasional slaughter for meat. Dairy production in this zone is not commensurate with herd sizes and livestock ownership. In general, a fraction of lactating cows (about 1 in 8) is milked for consumption.

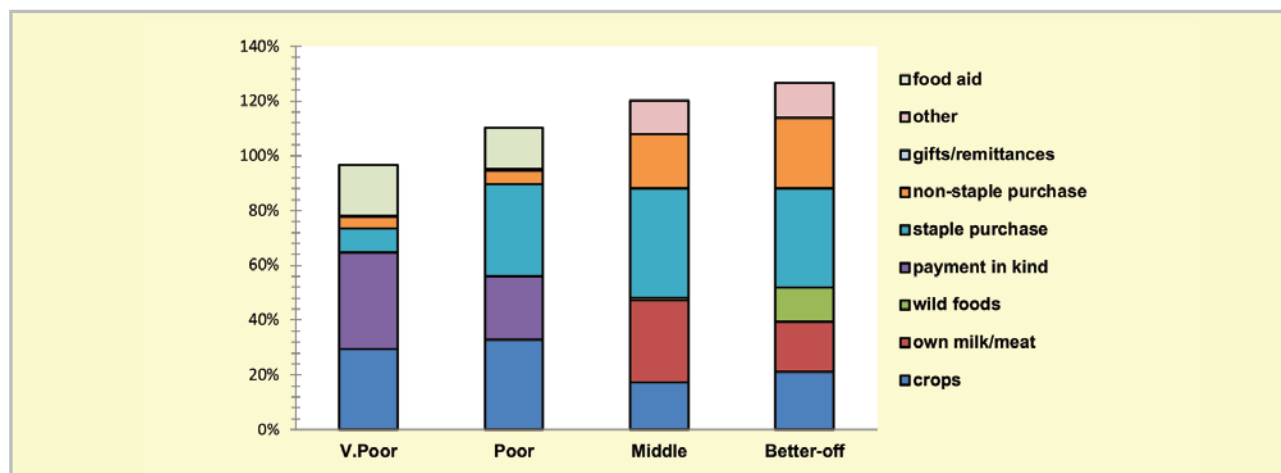


Figure 34: Sources of food (expressed as percentage of overall total food energy needs) for each wealth group (Source: HEA, Qualitative Output)

The poorest households' children received additional food from school lunches, which is their official food assistance. Wealthier households tend to send their children to fee-paying schools that did not offer meals.

6.2.5 Gender analysis of who produces food in ZALOF

Policy makers recognize that youths and women represent a vast human resource potential in development, with their own specific problems, concerns, needs, and aspirations. They need to be promoted to ensure their participation is equitable and equal in all development programmes. Gender and social status play an important role in determining access to food and cash, and responses to shocks and change. Poor female-headed households with little land may work for 'better-off' households to get money to buy food; the 'better-off' may use profits from agriculture and employment as capital to engage in trade and business enterprises. In the event of a crisis and the COVID-19 lockdowns, 'poor' and 'better-off' households were affected differently. The 'poor' households lost opportunities to hire out their labour and obtain income for their daily needs, whereas the 'better-off' households managed to use their savings to cushion their households from food insecurity. Therefore, different wealth groups warrant separate examination for relevant policy options to improve their household welfare.

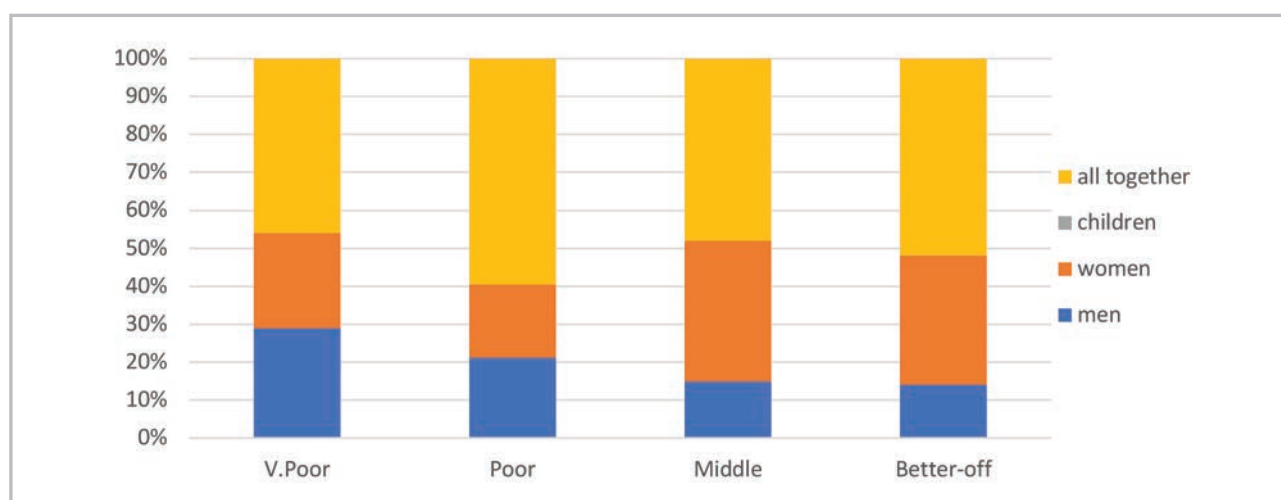


Figure 35: Gender breakdown of who produces food in the zone for each wealth group (Source: HEA, Qualitative Output)

The results indicated that men and women altogether contributed significantly to generate food. This was about 51 per cent across all wealth groups. Men appear to contribute significantly to the production of food among very poor and poor households, with their contributions declining as wealth increases. Women's contribution to food production increases as wealth increases. However, there are still challenges and emerging issues relating to gender mainstreaming and youth participation in development. These include HIV and AIDS, poor youth participation in the development agenda, gender-based violence (GBV), increased environmental degradation, climate change and high levels of poverty. Women still face many challenges, including the burden of care, which takes away much of their time for productive work. They also have poor access to extension services, information, inputs, and markets. Hence addressing the gender gap in development, including agriculture, could raise the scale of economic activities and crop production, and boost agricultural yield and the overall GDP, thus lifting a significant proportion of people out of poverty. Further, there has been a general inadequacy among all the gender structures at all levels to maintain a collective and sustained response to gender and youth empowerment issues.

6.2.6 Sources of cash income in ZALOI Zone of Mopani and Vhembe districts

Cash incomes varied considerably across wealth groups, with the 'better-off' earning above R700,200 per annum, ten times as much as the 'very poor', who earned only R67,525 per annum. Figure 36 shows this distribution - it must be noted that the bars in the figure are not quartiles, they represent wealth groups and wealth groups are not distributed evenly (see Wealth Breakdown, above).

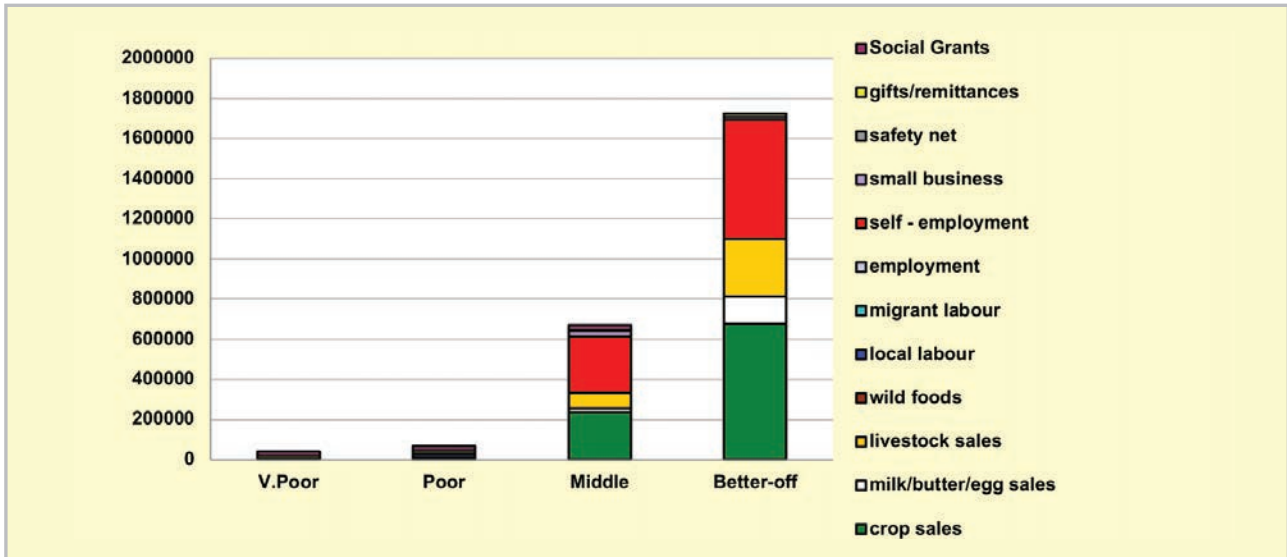


Figure 36: Sources of annual cash income by wealth group

The main sources of cash incomes in the zone are: crop sales, self and formal employment - for the 'middle' and 'better-off' - and cash grants for the 'poor' and 'very poor' (Figure 37). This is in keeping with most surveys that ask for the main livelihood source.

However, the point of this enquiry was to gain an understanding of how all livelihood sources come together to make up an income. This is essential because it enables practitioners to link a hazard (such as a price change) to outcomes and it enables other users to see potential areas of intervention. By dividing the value of each source by the total income, we can see these proportions, and this is presented in the graph in Figure 38 below.

For the 'very poor' and 'poor', social grants made up 52% and 32% of total cash income, respectively; the remainder was from casual labour (mostly domestic work, agricultural piece work, construction jobs) and self-employment (collecting natural products for sale, weaving, making bricks, etc.). The 'poor' earn small amounts of income through livestock sales - usually goats (15%), petty trading (5%), and remittances (18%) (Figure 37). This, coupled with a small income from the formal sector (R12,000 annually) was what distinguished their livelihoods from that of the 'very poor'. The analysis showed that poor households would lose up to 32% of their income sources due to COVID-19 lockdowns and any movement restrictions in the area. Income from casual labour would not be available during the pandemic lockdowns leading to a worsening food security situation for the very poor and poor households who comprise the majority of the population in this area.

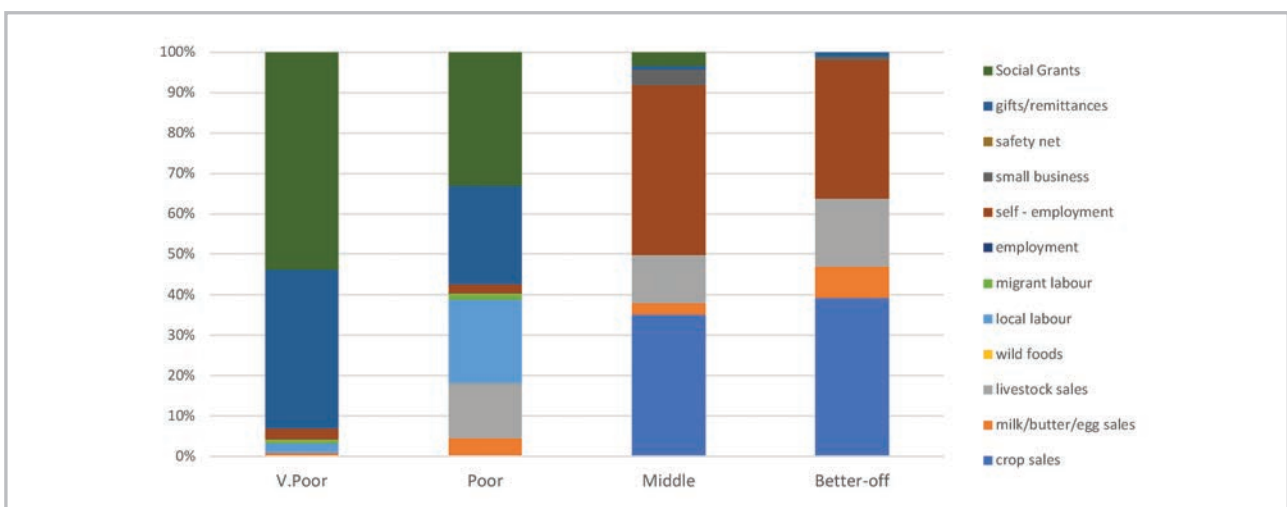


Figure 37: Sources of annual cash income as a percentage of total, by wealth group

The 'middle' and 'better-off' gain their cash from a formal wage or salary for the better part of their income. Some 'middle' households may have a member that works seasonally on the commercial farms, but earnings typically amount to almost R126,000 per annum, while the 'better-off' earn around R168,000 per annum (Figure 36). 'Middle' and 'better-off' households also gain a little cash from grants (for example, pensions and fostering are not means-tested and the probability of a household having a pensioner in it is about one in two). The 'middle' and 'better-off' wealth groups also have employment opportunities and businesses which contribute to their improved livelihood and welfare. These well-off households were able to cushion their food availability and access even during lockdowns as they can buy in bulk and store for any unforeseen event or crisis.

The earnings from livestock products are nil, which is lost productivity. The numbers of cows that are milked compared with those likely to be lactating is low and this is due to a few factors: lack of economic incentives for milking, lack of time by the cattle-owners (because they are full-time employed), and minimal herd management.

6.2.7 Sources of food in ZANOC of Waterberg and Capricorn districts

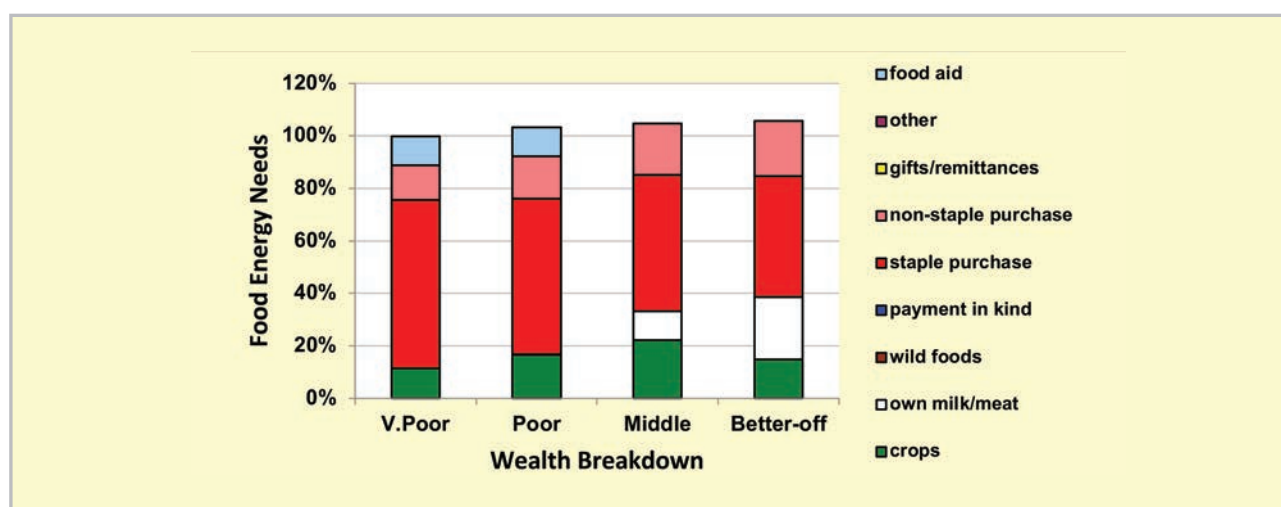


Figure 38: Sources of food (expressed as percentage of minimum average food energy needs) for each wealth group

Purchases were the largest source of food, contributing about 66% to 77% of minimum food energy needs (Figure 38). The contribution from staple food purchases *decreased* steadily as households get wealthier. Conversely, the contribution from non-staple food purchases increased with increasing wealth. Most households and all wealth groups also consume food from their own crop production, although for the 'very poor' it is only about 11%, because they lack the labour and capital to produce any significant quantities of their own food. The 'better-off' and 'middle' have the highest contribution to their food energy from both staple and non-staple crops, at about 72% to 67% of their minimum needs, respectively (Figure 39). The analysis showed that about 77% and 75% of the food purchases which needed to be obtained on almost daily basis from local markets were affected for the 'very poor' and 'poor' households in this area during COVID-19 lockdowns. This exacerbated the food insecurity level of the 'poor' and 'very poor' households in Waterberg and Capricorn districts.

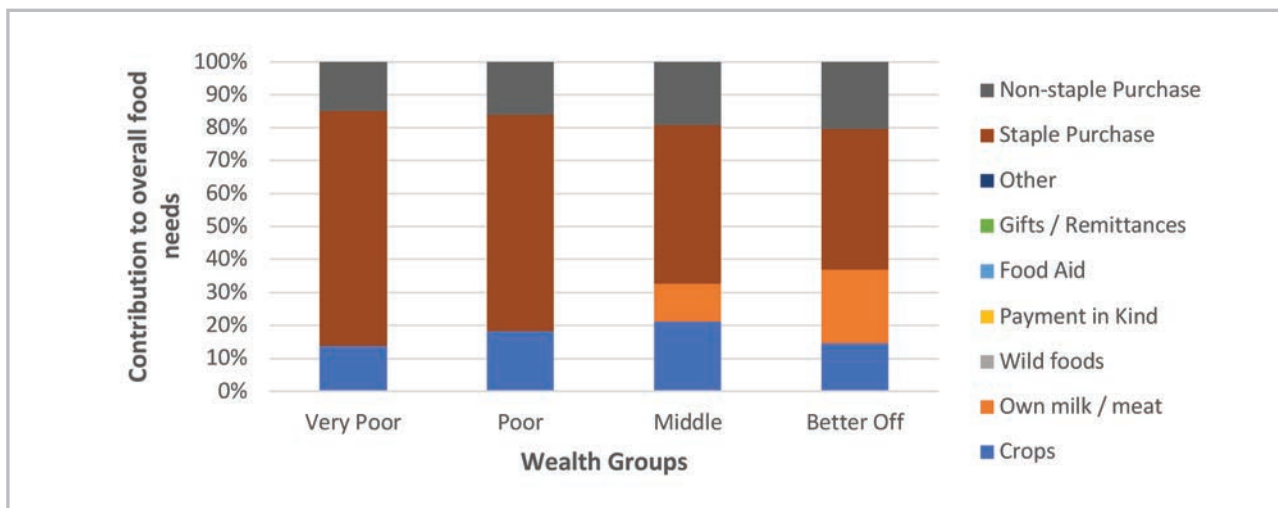


Figure 39: Food Source as contribution to the total

Only the 'middle' and 'better-off' households obtain substantial food from their livestock products; this is usually from cow's milk and occasional slaughter for meat (the 'poor' obtain a small contribution from the meat of an occasional slaughter). Dairy production in this zone is not commensurate with herd sizes and livestock ownership. In general, a fraction of lactating cows (about 1:3 to 1:6) is milked for consumption.

The poorest households' children receive additional food from school lunches, which is the official food assistance. This food source for the poor households was also affected as schools were closed during the COVID-19 lockdowns. Wealthier households tend to send their children to fee-paying schools that do not offer meals. All households may collect wild foods for consumption (e.g., mopane worm or marula fruit) but the quantities involved do not merit a significant contribution to food energy (the worms may be a significant protein source).

6.2.8 Gender breakdown of who produces food

Policy makers recognize the need for a participatory and inclusive approach to improving access to food and income in the communities. Hence there is a need to promote and ensure the inclusion of the youths and women in food production. This is very critical to promote and ensure participation, equity, and equality in all development programmes.

The results indicated that young adults, men, and women altogether contribute significantly to generate food among the 'poor' and 'very poor' households in most districts and municipalities in this livelihood zone. Women appeared to contribute significantly to the production of food among middle and better-off households. However, there are still challenges and emerging issues relating to gender mainstreaming and youth participation in development (Figure 40). These include HIV and AIDS, poor youth participation in the development agenda, gender-based violence (GBV), increased environmental degradation, climate change, and high levels of poverty. Women still face many challenges, including the burden of care, which takes away much of their time for productive work. They also have poor access to extension services, information, inputs, and markets. Hence addressing the gender gap in development, including agriculture could raise the scale of economic activities, crop production, boost agricultural yield and overall GDP - thus lifting a significant proportion of people out of poverty.

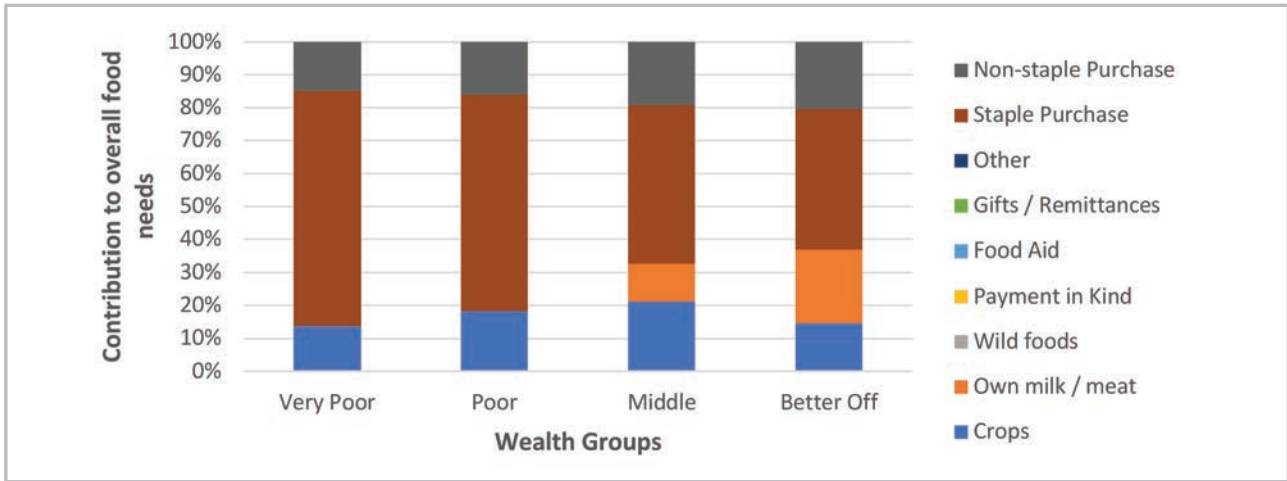


Figure 40: Gender breakdown of who produces food in the zone for each wealth group

6.2.9 Sources of Cash in ZANOC of Waterberg and Capricorn districts

Cash incomes vary considerably across wealth groups, with the 'better-off' earning R384,983 per annum, almost twelve times as much as the 'very poor', who earn R32,230 per annum. Figure 41 shows this distribution as the bars represent wealth groups and wealth groups.

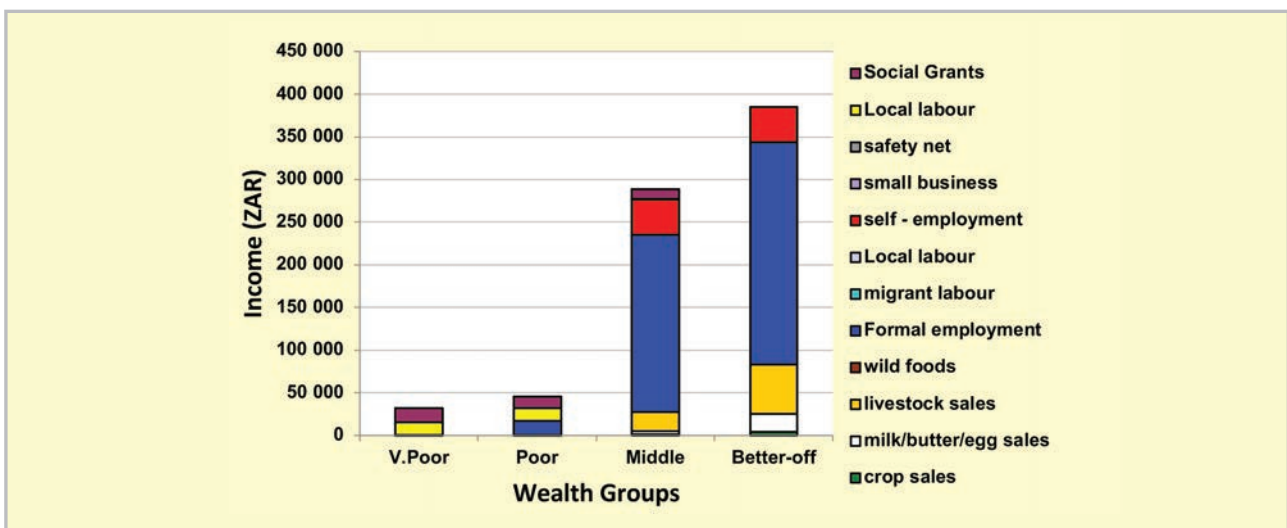


Figure 41: Sources of annual cash income by wealth group

The main sources of cash incomes in the zone are formal employment - for the 'middle' and 'better-off' - and cash grants for the 'poor' and 'very poor'. This is consistent with most surveys that assess livelihood strategies and their contribution to the main livelihood income source.

However, the point of this enquiry was to gain an understanding of how all livelihood sources contribute to the main income of each wealth group in the sampled communities. This is important because it enables practitioners to link a hazard (such as a price change) to an income and it enables other users to see potential areas of intervention. By dividing the value of each source by the total income, we can see these proportions, and this is presented in Figure 42.

For the 'very poor' and 'poor', grants make up 57% and 42% of total cash income, respectively; with the remainder coming from casual labour (mostly domestic work, agricultural piece work, construction jobs) and self-employment (collecting natural products for sale, weaving, making bricks, etc.). The 'poor', 'middle', and 'better-off' earn some of their cash (around 8%) from animal sales and from petty trading or a small business (4% to 14%).

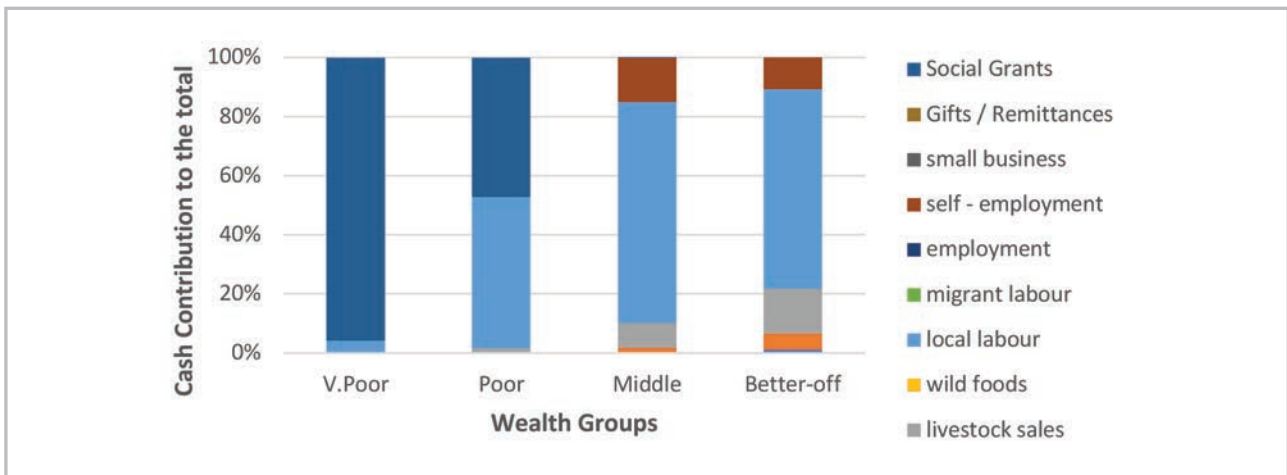


Figure 42: Sources of annual cash income as a percentage of total, by wealth group

The 'middle' and 'better-off' gain their wealth from a formal wage or salary for the better part of their income. Some 'middle' households may have a member that works seasonally on the commercial farms, but earnings typically amount to almost R79,000 per annum, while the 'better-off' earn around R264,000 per annum. 'Middle' and 'better-off' households also gain a little cash from grants. The earnings from livestock products are nil, which is lost productivity. The numbers of cows that are milked compared with those likely to be lactating is low and this is due to a number of factors: lack of economic incentives for milking, lack of time by the cattle-owners (because they are full-time employed), and minimal herd management.

6.2.10 Sources of food in ZALOF of Mutale, Thulamela, and Makhado

Despite the good rainfall and fertile soils, purchases still make up the largest portion of people's sources of food. Food purchases contribute 70% to 72% of food energy needs; this was lower than in other livelihood zones in the province (which are 80% to 90%) but was still more than half of the requirements. The contribution to food energy from staple food purchases decreased steadily from 66% for the 'poor' to 55% for the 'better-off'. Conversely, the contribution to food energy of non-staple food purchases increased with increasing wealth, from 12% for the 'very poor', to 17% for the 'better-off' (Figure 43).

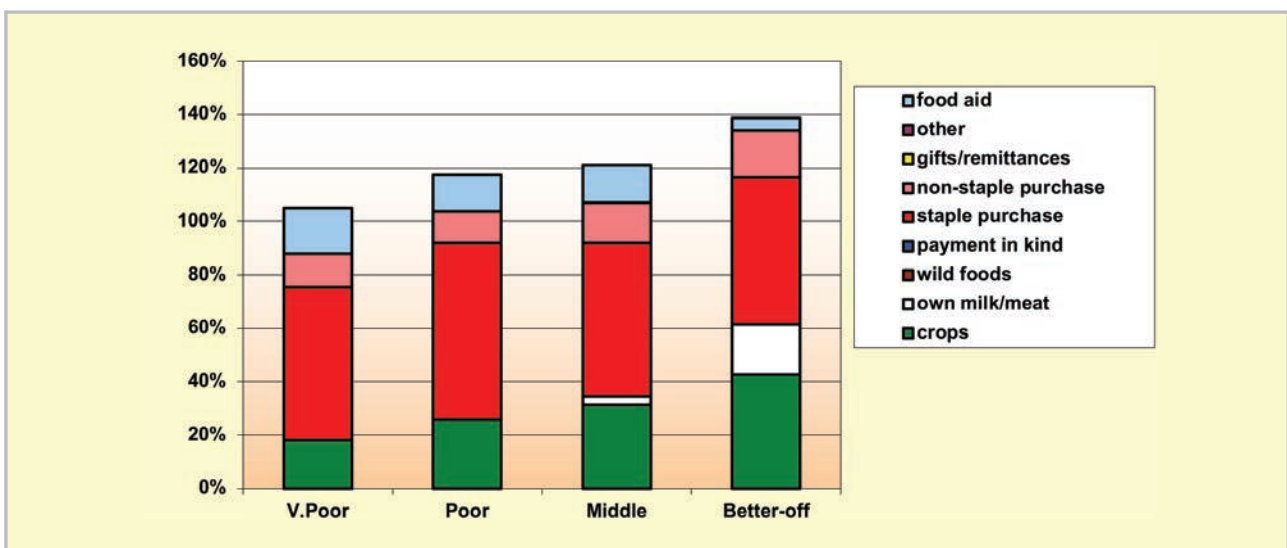


Figure 43: Sources of food (expressed as percentage of minimum average food energy needs) for each wealth group

The contribution to food energy needs from own crop production increased with increasing wealth, from 18% for the 'very poor' to 43% for the 'better-off'. The breakdown into staple and non-staple did not follow any pattern with wealth; the contribution from non-staple crops being about 12% to 17% (Figure 44). Yields in the zone were low, given the fertility and land capability - 'very poor' and 'poor' households obtain only 800 kg/Ha; this rose to 1,200 kg/Ha for the 'middle' and 1,800 kg/Ha for the 'better-off'. Wealthier households had capital for inputs and hired labour, ensuring their crops were planted and weeded in time as well as being protected from pests.

'Middle' and 'better-off' households obtained a tiny proportion of their needs from their livestock (3% and 19%, respectively); this was usually from cow's milk and occasional slaughter for meat. Dairy production in this zone was not commensurate with herd sizes and livestock ownership. In general, a fraction of lactating cows (about 1 in 8) was milked for consumption.

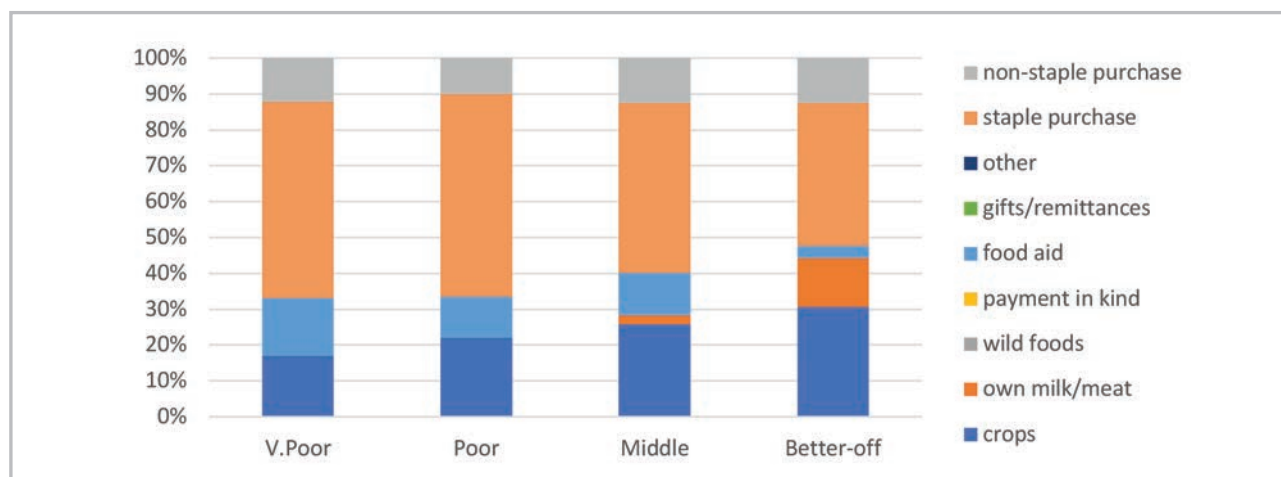


Figure 44: Sources of food as overall to the total by wealth breakdown

The poorest households' children received additional food from school lunches, which was the official food assistance. Wealthier households tend to send their children to fee-paying schools that do not offer meals.

6.2.11 Sources of Cash in ZALOF of Mutale, Thulamela, and Makhado

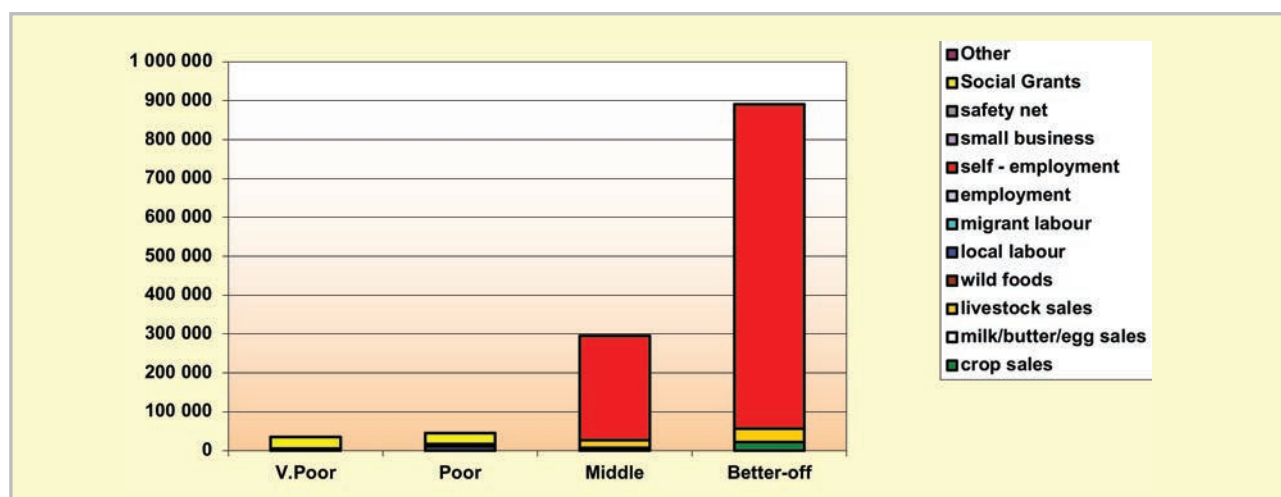


Figure 45: Sources of annual cash income by wealth group in ZALOF

Cash incomes varied considerably across wealth groups, with the 'better-off' earning R890,221 per annum, twenty-five times as much as the 'very poor', who earn only R35,194 per annum. Figure 44 shows this distribution. The main sources of cash incomes in the zone were: formal employment - for the 'middle' and 'better-off' - and cash grants for the 'poor' and 'very poor'. This is in keeping with most surveys that ask for the main livelihood source.

By dividing the value of each source by the total income, we can see these proportions, and this is presented in the graph in Figure 45.

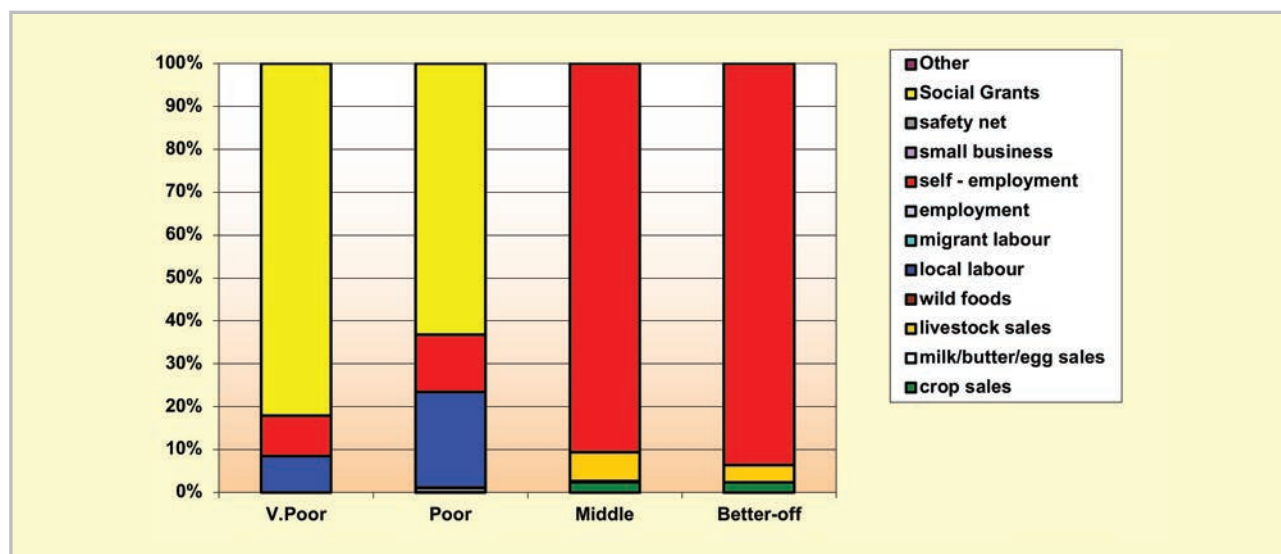


Figure 46: Sources of annual cash income as a percentage of total, by wealth group in ZALOF (Source: HEA, Qualitative Output)

For the 'very poor' and 'poor', grants make up 82% and 62% of total cash income, respectively; the remainder is coming from casual labour (mostly domestic work, agricultural piece work, construction jobs, etc.) and self-employment (collecting natural products for sale, weaving, making bricks, etc.). This income was mostly affected during COVID-19 lockdowns, leaving the poor and very poor hopeless and food insecure. The 'poor' earn small amounts of income through livestock sales - usually goats (7%), petty trading (3%), and remittances (3%). This, coupled with a small income from the formal sector (R12,000 annually or 21%) is what distinguishes their livelihoods from that of the 'very poor'. The 'middle' and 'better-off' gain their cash from self-employment (R833,604 and R267,384 annually, respectively) and a formal wage or salary for the better part of their income. Some 'middle' households may have a member that works seasonally on the commercial farms, but earnings typically amount to almost R126,000 per annum, while the 'better-off' earn around R168,000 per annum. 'Middle' and 'better-off' households also gain a little cash from grants (for example, pensions and fostering are not means-tested and the probability of a household having a pensioner in it is about one in two).

6.2.12 Hazards, vulnerabilities, and response strategies

Since households are dependent on markets for most of their food they are vulnerable to market shocks. These 'market shocks' may consist of escalating food prices, eroded grants (for example, when they are not adjusted to match consumer inflation), and job losses.

Droughts are frequent and have an impact on food production by reducing crops. However, unless food prices also rise simultaneously, households will manage crop losses by prioritising more cash for their food purchases. A severe drought can badly affect animal condition and production, but the current low productivity means that it would only have an impact on 'better-off' households' asset bases. Strategies which households may consider to caution themselves from pre-carriers situations may include switching expenditure, seeking more casual work (usually outside of the village), or selling off assets or belongings.

6.3 Access to agriculture extension services and markets

Agricultural extension has the potential to improve household production in the province. Some of the extension services provided in the study area include dipping, training, and provision of loans, inputs, and advice to improve livestock and crop production.

Table 34: Access to agricultural extension services disaggregated according to sex, age, and district

		Access to extension services			
		No access		Access	
		N	Row N %	N	Row N %
Sex	Male	162	94	16	6
	Female	186	80	27	20
Household head age category	18 - 24	13	100	0	0
	25 - 34	34	96	3	4
	35 - 44	41	81	6	19
	45 - 54	64	87	13	13
	55 - 64	64	86	11	14
	65+	113	84	8	16
District name	Capricorn	63	89	10	11
	Sekhukhune	53	82	12	18
	Mopani	150	81	27	19
	Vhembe	117	95	9	5
	Waterberg	37	87	2	13

Table 36 shows that access to agriculture extension services is very limited across all the five districts, with the highest being in Vhembe (95%), and among males (94%). The 18-24 years age group reported that they never receive agriculture extension services and generally, inaccessibility to extension services was high across all the age groups. The government, therefore, needs to take urgent steps to address the problem of provision of agriculture extension services in the Limpopo Province.

6.4 Access to markets

The availability and access to markets by households in the Limpopo Province is relatively good, with all the districts reporting over 70% accessibility to markets (Table 35). The highest access was recorded in Capricorn District, maybe because of the proximity to the provincial town (Polokwane). The 18-24 years age group reported the highest access to markets (100%), probably because these are the most mobile group of the population. The 35-44 years age group reported the least access to markets (64%).

Table 35: Access to markets by household

		Market access			
		No		Yes	
		N	Row N %	N	Row N %
Sex	Male	30	21	163	79
	Female	32	18	219	82
Household head age	18-24	0	0	15	100
	25-34	9	20	33	80
	35-44	11	36	44	64
	45-54	7	5	76	95
	55-64	13	15	73	85
	65+	20	23	117	77
District name	Capricorn	12	9	72	91
	Sekhukhune	16	30	56	70
	Mopani	27	18	161	82
	Vhembe	17	14	134	86
	Waterberg	5	8	37	92

6.5 Access to road infrastructure

Access to infrastructure such as roads is critical in enhancing food and nutrition security. Both females and males reported high levels of access to roads, with the 18-24 years age category having 100% access (Table 36). Across the five districts, road access was relatively good, with the highest (96%) being recorded in Waterberg District, whilst the least was reported in Mopani District (74%).

Table 36: Access to road infrastructure by households

		Access road infrastructure			
		No		Yes	
		N	Row N %	N	Row N %
Sex	Male	40	14	150	86
	Female	46	13	203	87
Household head age category	18-24	0	0	14	100
	25-34	11	14	29	86
	35-44	10	11	46	89
	45-54	14	13	69	87
	55-64	23	29	61	71
	65+	23	10	113	90
District name	Capricorn	19	10	64	90
	Sekhukhune	16	10	55	90
	Mopani	44	26	142	74
	Vhembe	25	17	125	83
	Waterberg	3	4	37	96

Seasonal variation

The results depicted by the seasonal calendar developed from HEA focus group discussions in Limpopo Province indicate that the rain season starts from September, stretching over to February with pronounced farming activities of land preparation, planting, and weeding. However, the changing climatic conditions are shifting the planting dates as well as the onset of rains within the province. Harvesting of crops and other activities such as gardening starts in March up to around June. Similar season characterisation has been reported in other studies such as Maonya and Mpandeli (2012). Previous studies in the Limpopo Province have also reported that rainfall is highly seasonal, with 95% occurring between October and March (Mmarete, 2003), often with a mid-season dry spell during critical periods of growth (FAO, 2009). Midsummer drought often leads to crop failure and low yields (Beukes et al., 1999). Average rainfall is about 800mm, but it often varies temporarily.

Access and land ownership

There is pronounced limited access to land by households across the five districts of Limpopo Province. Except for Mopani District, all the other districts reported very limited access to land. This explains the limited agriculture production of food crops in most of the districts. Most households reported that they own land, yet this land is between 0-0.25 hectares, which is primarily used for residential purposes. This is buttressed by Groenewald and Nieuwoudt (2003) who note that land holdings in these former homelands of Limpopo Province are generally very small and are mainly used for residential and, to some extent, subsistence farming. Securing land rights for communities has been shown to improve production and household food security (Prosterman, 2013). In South Africa, there are dual systems when it comes to land rights i.e., statutory law vested in the Constitution and customary law vested mostly in patrilineal tribal traditions and customs (Toulmin, 2008). In Limpopo Province, which is mostly rural, most of the land is held under customary law and this has eased access to land for most households since the land held by traditional authorities is cheaper and easily accessible (Figures 14 -16). The 18-24 years age group in the Limpopo Province reported the least land access (<5%) across the five districts, which calls for a need to empower the youths with land ownership since it is the category currently plagued by high levels of unemployment. This would result in increased participation by youths in agriculture income generating projects, and improved food availability at the household level. Land access is also limited among female-headed households. This result is similarly echoed by Murugani et al. (2014) who argue that in Limpopo Province, land access by females is mediated by patrilineal customary law where women have mostly secondary property rights as wives. Consequently, their land use security is derived from the family and other means of fostering accountability (Murugani et al., 2014). These cultural practices have led to women having limited access and user rights to land for agricultural purposes, particularly in rural communities.

Agriculture production systems

Livestock production is reported to be limited in Limpopo Province, with Sekhukhune District being the highest (43%) in livestock rearing, followed by Waterberg District. These two districts generally receive very limited rainfall and are generally dry such that there is high crop failure. This justifies the high percentage of livestock rearing as similarly reported by Materechera and Scholes (2021). There is also limited crop production, mostly in Sekhukhune, Waterberg, and Mopani districts. Literature also argues that high-value crops (HVCs), also known as horticultural crops or non-traditional crops [14], are grown for food, nutrition, human health and wellbeing and include fruits and vegetables, tree nuts, dried fruits, horticulture, and nursery crops (Materechera and Scholes, 2021).

Household Food Access Indicators

This section reports FNS as captured by the HFIAS, HHS, HDDS, and the FCS. These indicators are presented according to districts, sex, age, and other important variables. Further analysis was done to investigate the extent to which food security levels, as captured by the various indicators, vary across districts, demographics, and socio-economic characteristics of households. The results presented may indicate an abnormal situation or worst case scenario for certain indicators and some missing information given the COVID-19 lockdown included shocks. Interpretation of the findings have to be interpreted with caution.

7.1 Household Food Insecurity Access Scale

The Household Food Insecurity Access Scale (HFIAS) score measures the degree of food access challenges at the household level. It is calculated by adding the households' responses to nine questions asking about the frequency of certain behaviours that signify rising challenges in accessing food in a particular household (Coates et al., 2007). The higher scores indicate more food access challenges, while low scores indicate less food access challenges. The lower bound of the score is 0, while the upper bound is 27. On average, the HFIAS score for Limpopo was 6.7, suggesting relatively low levels of food access challenges in Limpopo.

Interpreting this continuous score in terms of its food security implications is not straightforward, necessitating the need to generate categorical indicators of food insecurity (Coates et al., 2007). However, when the HFIAS score is used to categorise households into four levels of food (in)security status (i.e., food secure, mildly food insecure, moderately food insecure, and severely food insecure), the picture becomes less rosy. The food secure category are those households that do not experience food access conditions, and rarely worry about not having enough food. Households in the mildly food insecure category worry about not having enough food sometimes or often, are unable to eat preferred foods, and rarely eat some foods considered undesirable. These households have not cut back on food quantities, and have not experienced most severe access food challenges such as running out of food, going to bed hungry, or going the whole day and night without eating. A moderately food insecure household frequently consumes food that is of low quality, and/or sometimes or often eat undesirable foods, and/or rarely or sometimes reduce quantities of food consumed (i.e., reducing the size of meals or number of meals). A severely food insecure household not only cuts back on meal size or number of meals often, but also experiences any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating). The cut-off was as follows: food secure if HFIAS is less than or equal to 1, mildly food insecure if HFIAS is between 2 and 8, moderately food insecure if HFIAS is between 9 and 17, and severely food insecure if HFIAS is greater than or equal to 18.

Figure 47 presents the proportion or the prevalence of food insecurity among the sampled households. The overall results showed that more than half of the households (59%) in Limpopo experienced food insecurity, with only 41% found to be food secure. Figure 47 shows that 11% of the households were severely food insecure, 29% of the surveyed households were moderately food insecure, and 19% of the households were mildly food insecure. Overall, the findings of this study slightly differ from the findings of the GHS 2020 which found more proportions of food secure households than the food insecure ones. This household food security situation is not strange, bearing in mind that the data was collected three weeks after the first lockdown due to the COVID-19 pandemic. This implies that the lockdown somewhat may have affected the abilities of households to access food. However, these results are in line with most of the food security findings which generally indicate that a significant proportion of households experience food access challenges in South Africa. The results are in line with most of the food security findings which generally indicate that a significant proportion of households' experience food access challenges in South Africa. For example, in 2016, SAVAC commissioned a study on livelihoods, food, and nutrition security in which more households

were found to be food insecure than those that were food secure (Ngidi et al., 2015). In a food security study conducted in Limpopo, De Cock et al. (2013) also found that more households were food insecure compared to food-secure households.

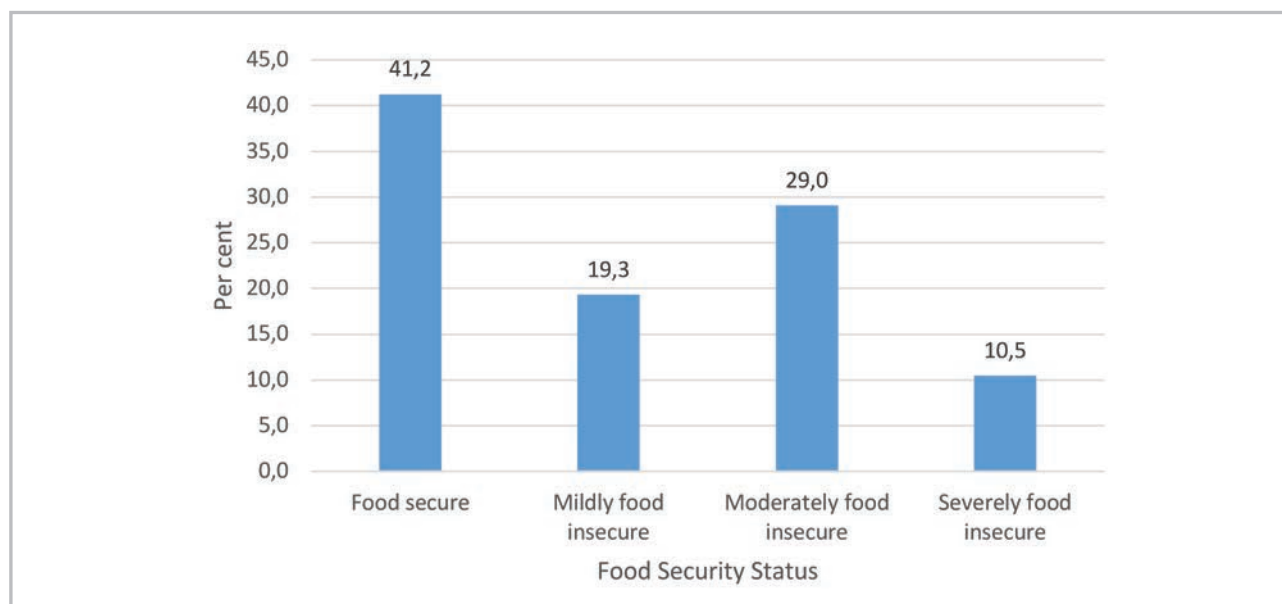


Figure 47: The categorized food security situation, using HFIAS

Table 37 shows that the food security status of households significantly varied by age and sex of household head, as well as by district. The results show that male-headed households were slightly more food secure than the female-headed households, with 47% of the male-headed households found to be food secure, compared to only 36% of female-headed households in this category. In any category of the HFIAS, female-headed households experienced higher levels of food insecurity. About 17% and 22% of male-headed and female-headed households experienced mild food insecurity, respectively. More female-headed households experienced moderate food insecurity compared to male-headed households (Table 37). Severe food insecurity was experienced by 9% of the male-headed households, compared to 21% of the female-headed households that fell within the same category.

Table 37: District level and gendered food security situation as determined by HFIAS

		Food secure		Mildly food insecure		Moderately food insecure		Severely food insecure	
		N	Row N %	N	Row N %	N	Row N %	N	Row N %
Sex of household head	Male	266	47	143	17	237	27	87	9
	Female	321	36	205	22	323	31	121	12
age category of household head	18-24	10	49	9	13	20	27	7	12
	25-34	50	39	37	22	50	29	20	9
	35-44	84	38	48	23	90	32	25	8
	45-54	104	38	63	14	112	34	42	13
	55-64	128	37	71	19	101	29	48	16
	65+	189	47	108	22	160	23	60	8

		Food secure		Mildly food insecure		Moderately food insecure		Severely food insecure	
		N	Row N %	N	Row N %	N	Row N %	N	Row N %
District name	Capricorn	162	43	87	26	89	23	35	8
	Sekhukhune	115	54	87	16	162	22	65	9
	Mopani	143	31	91	26	128	31	61	11
	Vhembe	139	37	99	20	146	37	27	6
	Waterberg	111	31	46	14	137	37	59	18

Table 37 and Figure 48 show that households headed by the 18-24 years age group had the highest proportion of those who were food secure, followed by those households headed by over 65-year-olds compared to other age groups households, with 64% of the households within this age group found to be food secure. While the least food secure age group was 35-44 years, this age group was not found to be the most severely food insecure age group, as Table 4 illustrates that the age group 45-54 years had a higher percentage (28%) of household heads that were severely food insecure. This was followed by household heads in the age group of 35-44 years, where about 24% of the household heads experienced severe food insecurity.

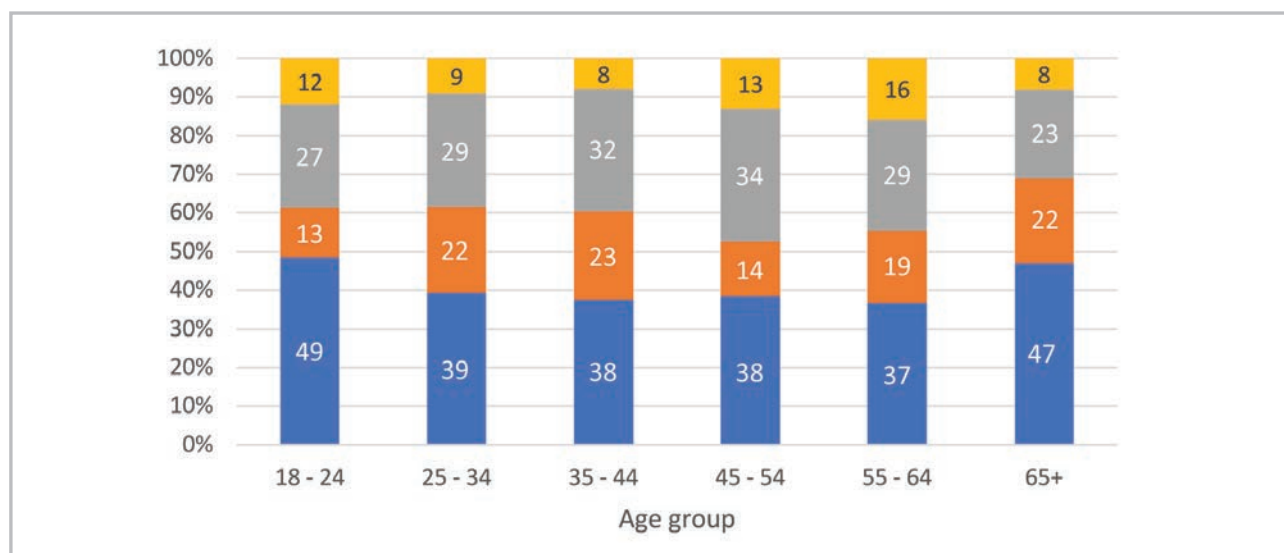


Figure 48: Food security status by age group

Table 37 and Figure 49 show that Sekhukhune District had the highest proportion of households that were food secure (54%), followed by Capricorn (43%) and Vhembe (37%) districts. Mopani and Waterberg districts had the joint lowest proportion (31%) of food secure households. Waterberg District (18%) had the highest proportion of households experiencing severe food insecurity, followed by Mopani (11%) and Sekhukhune districts. Moderate food insecurity was largely experienced by households from Mopani and Capricorn districts.

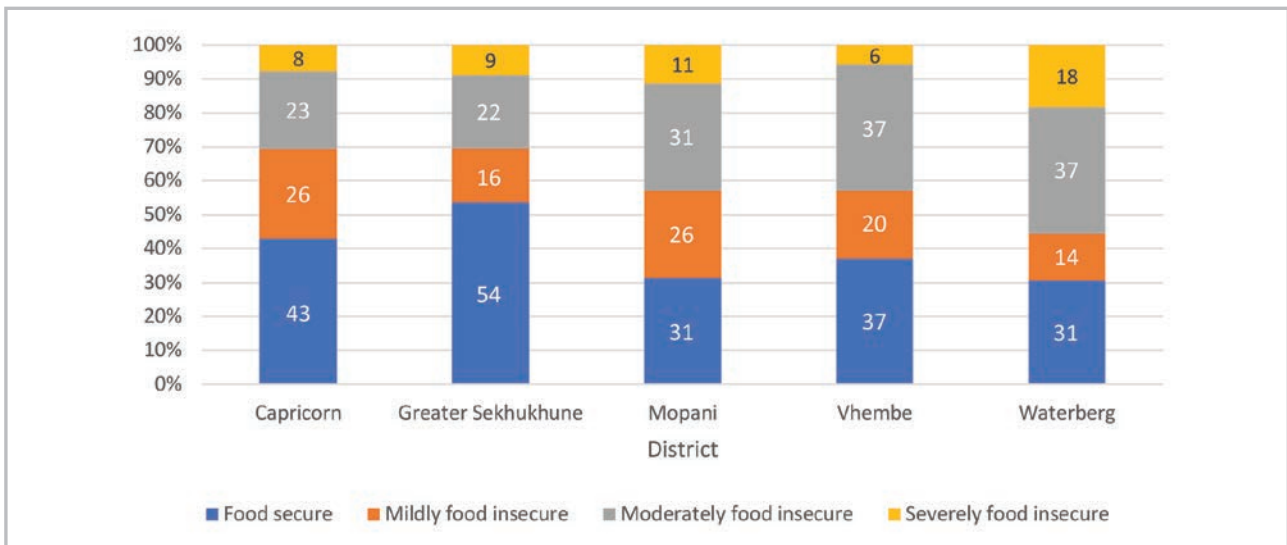


Figure 49: Food security status by district

7.2 Household Hunger Situation

The Household Hunger Scale (HHS) is a household food deprivation scale which is derived from selected HFIAS questions for use mainly in situations of high food insecurity levels. The results of the food security status as measured by the HHS showed that most of the sampled households experienced little to no hunger (84%). While a significant proportion of households experienced food insecurity (as shown by the HFIAS results), the HHS suggests that the level of food deprivation is not very severe for most of the households in Limpopo Province. Only 4% experienced severe hunger, with 12% experiencing moderate hunger levels (Figure 50).

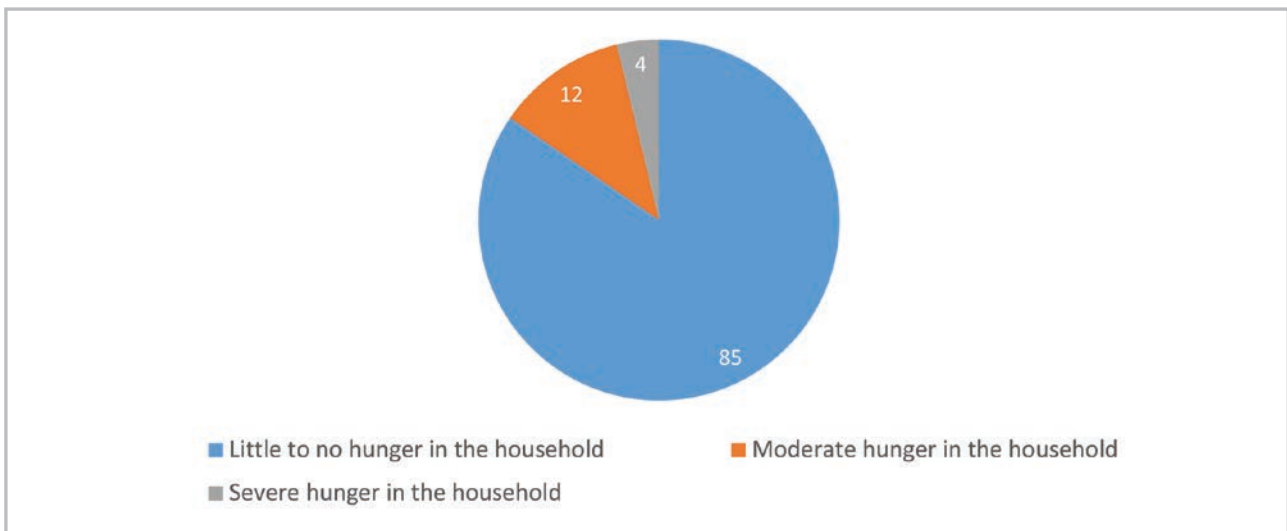


Figure 50: Food security situation as determined by percentage of households

Table 38 shows that the hunger status generally did not significantly differ between male-headed and female-headed households across all the categories of the HHS. Table 38 indicated that 87% of the male-headed households experienced little to no hunger, compared to 82% of the female-headed households. Likewise, the moderate and severe hunger in the household were slightly more experienced by female-headed households compared to male-headed households (Table 38). Households in the age group of 35-44 years experienced relatively more hunger compared to the other age groups, with the age group of 45-54 years being the least food secure group. Age group 65+ slightly experienced more severe food insecurity compared to other age groups.

Table 38: Food security situation, using HHS

		Little to no hunger in the household		Moderate hunger in the household		Severe hunger in the household	
		N	Row N %	N	Row N %	N	Row N %
Sex of Household Head	Male	626	87	98	10	29	3
	Female	822	82	136	13	39	5
Household Head Age	18-24	38	83	6	11	4	6
	25-34	129	81	28	13	6	6
	35-44	214	86	25	8	13	5
	45-54	260	80	49	15	16	5
	55-64	303	83	42	12	14	4
	65+	446	88	73	10	13	1
District	Capricorn	331	86	42	13	9	2
	Sekhukhune	349	89	70	9	20	2
	Mopani	349	81	66	15	19	4
	Vhembe	379	90	37	9	9	2
	Waterberg	281	75	61	16	21	9

At district level, Sekhukhune was the most food secure district, with 87% of the households found to have experienced little to no hunger. This was followed by Capricorn and Vhembe, with both districts found to have more than 80% of the households experiencing little to no hunger (Figure 51).

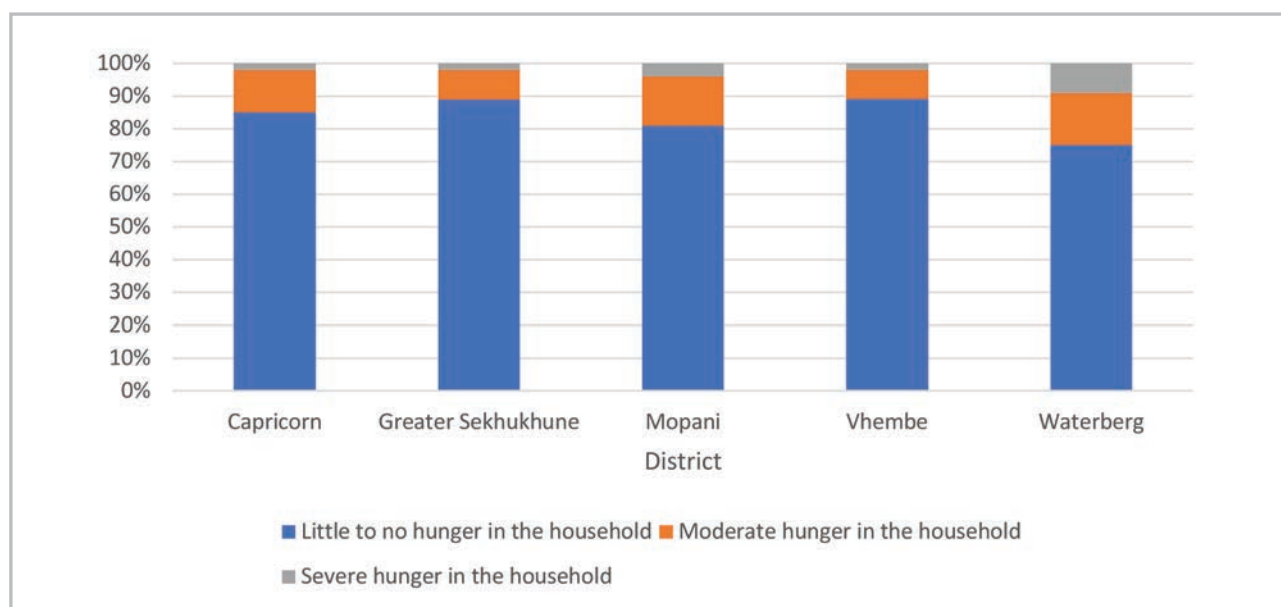


Figure 51: Household hunger status by district

7.3 Household Dietary Diversity Score (HDDS)

HDDS measures the economic ability of a household to access a variety of foods (Kennedy, 2011) and higher levels of HDDS imply improved chances of a household to consume enough of all food components necessary for good health. HDDS was constructed using the number of food groups consumed by the household over a 24-hour recall period. The food items were categorized into 12 different food groups. Table 39 shows that on average, the households in Limpopo consumed more than 7 out of 12 food groups, which suggests above average dietary diversity levels. Using the cut-offs suggested by Kennedy (2011), 83.4% of households consumed highly diverse diets (more or equal to 6 food groups) whilst 13.3% and 3.3% of the households consumed medium dietary diversity (4-5 food groups) and low diverse diets (less or equal to 3 food groups), respectively (Figure 52).

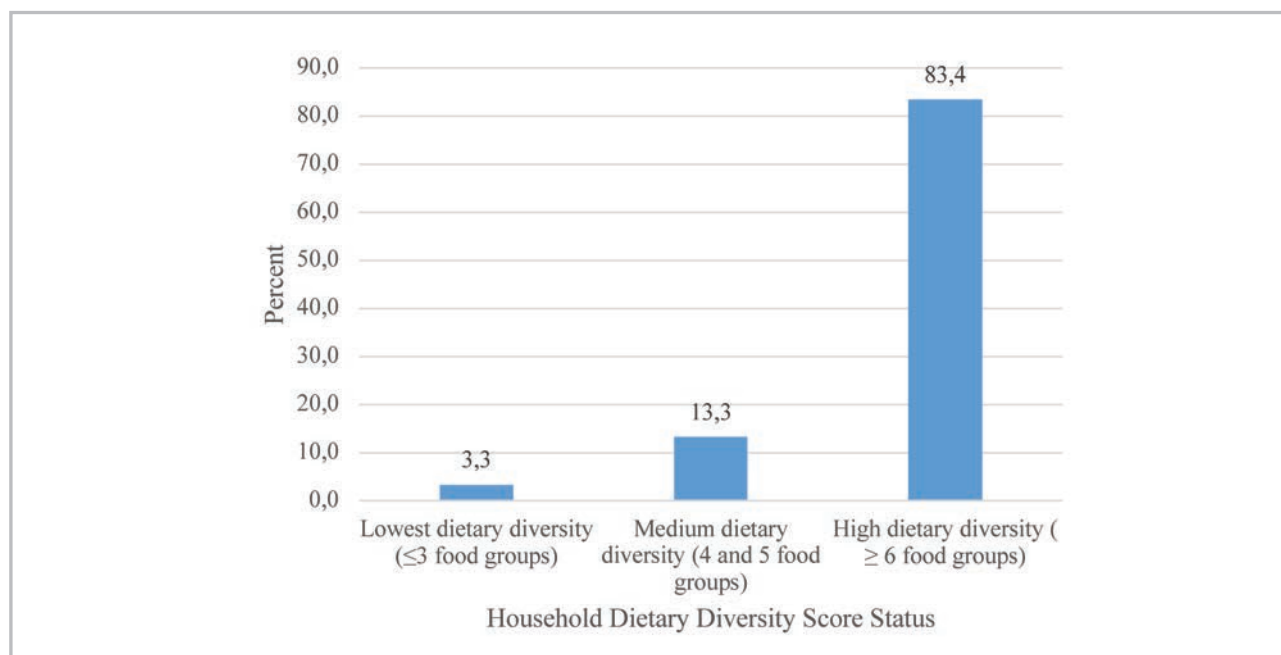


Figure 52: Household Dietary Diversity Scores

The results in Table 39 show that 2% of the male-headed households had the lowest dietary diversity compared to 5% of the female-headed households. About 84% of the male-headed households consumed the highest dietary diversity, compared to 82% of the female-headed households. Concluding within the context of this tool, these results generally suggest that male-headed households have better access to diversified food compared to female-headed households. In terms of the age groups, all age groups generally consumed a high dietary diversity, with results showing all but the age group 25-34 years having a higher percentage of 80% or above of households that consumed highly diversified food. Results of the age groups also show that household heads aged 55-64 years were the ones that largely consumed the lowest dietary diversity, followed by household heads within the age group of 45-54 years. In general, results from all districts but Mopani showed that the majority (more than 80%) consumed the highest dietary diversity. These results should be taken with caution because with a 24-hour recall, it is possible to find the situation looking good in terms of food variety simply because the previous day was a pension day.

Table 39: Household Dietary Diversity Scores

		Lowest dietary diversity (≤ 3 food groups)		Medium dietary diversity (4 and 5 food groups)		High dietary diversity (≥ 6 food groups)	
		Number	%	Number	%	Number	%
Sex	Male	20	2	98	14	543	84
	Female	39	5	131	13	725	82
Age	18-24	0	0	8	17	37	83
	25-34	6	3	30	21	108	75
	35-44	8	2	33	14	180	84
	45-54	14	5	39	12	244	83
	55-64	16	6	42	14	264	80
	65+	15	3	71	12	377	86
District	Capricorn	16	4	61	15	252	81
	Sekhukhune	20	3	59	10	329	87
	Mopani	12	4	62	18	309	79
	Vhembe	8	2	42	11	354	87
	Waterberg	12	4	54	16	257	80

However, HDDS should not be interpreted as a measure of nutrition or diet quality, as achieving a high dietary diversity score does not guarantee that important food groups, such as fruits and vegetables, are included in the diet. It is possible for households to lack crucial micronutrients even when consuming a diverse diet. Figure 53 shows the food groups and their frequency of consumption by the households. The figure shows that the most popular food groups were cereals, condiments, vegetables, and sugars. The least consumed food groups were pulses and nuts, fish and seafood, tubers, and eggs. Except for vegetables, Figure 53 shows that the most consumed food groups were mostly the less healthy ones, providing a different light to Figure 51, which gives an impression of highly diverse and healthy diets.

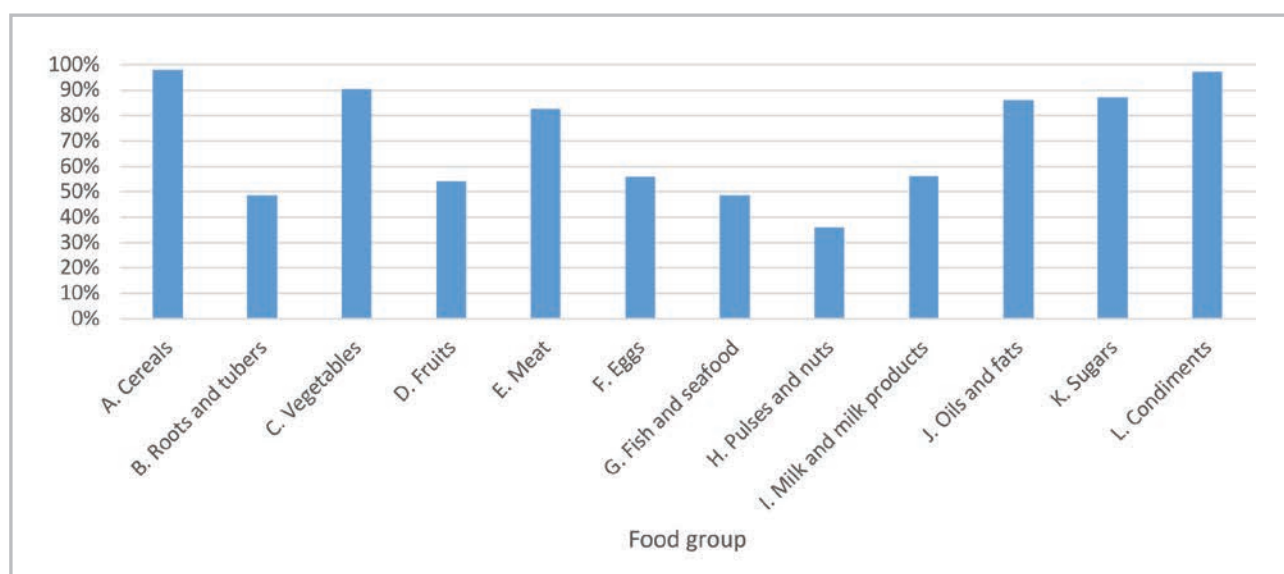


Figure 53: Frequency of food group consumption

7.4 Food Consumption Score

Food Consumption Scores (FSC) were calculated using the WFP methodology to further understand the levels of dietary diversity in the study areas. This FCS differs from Dietary Diversity in that it represents a weighted dietary diversity score.

Categories of FCS showed that most households (38%) were consuming adequately (acceptable) diversified diets and about 26% of households are at the borderline and could fall into unacceptable diversity of foods if no action is taken to help them improve their diets. Results further indicate that 35.9% of the households consumed poor diets (Figure 54). This is concerning because 36% is a big proportion of households that are not consuming acceptable diets, and this may lead to nutrition related problems.

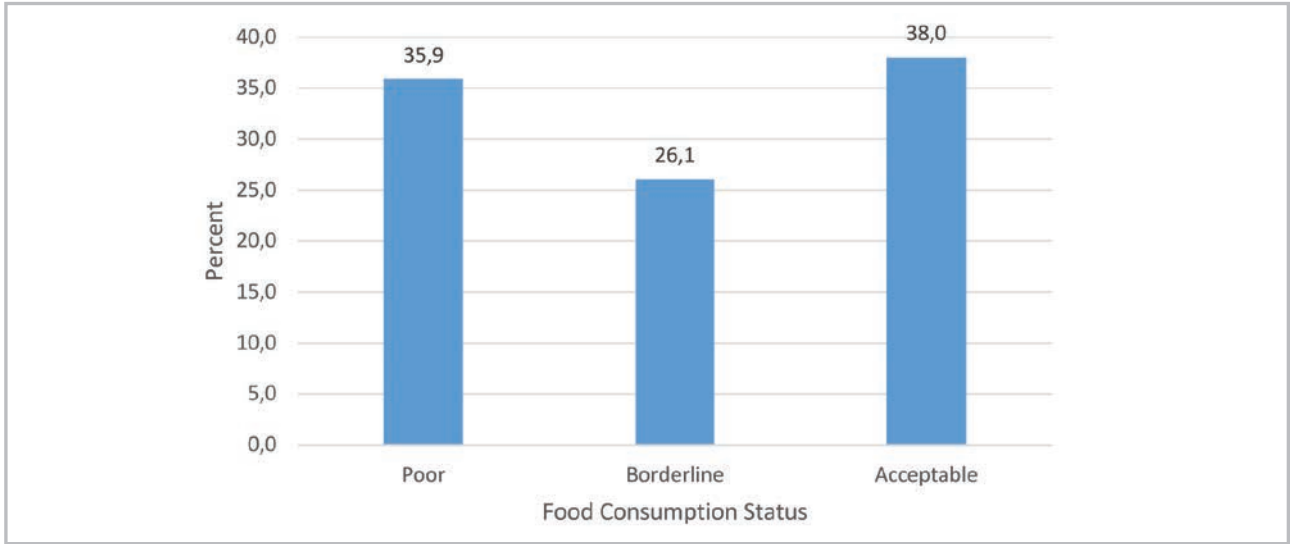


Figure 54: Food consumption score

Results in Table 40 indicate that female-headed households had slightly more acceptable diets compared to male-headed households. About 38% of the female-headed households were found to have consumed acceptable diets, compared to 35% of the male-headed households. More household heads within the age group 18-24 years consumed food with an acceptable diet, and this was followed by household heads within the age group of 45-54 years. Surprisingly, households from the age group of 18-24 were also the highest that consumed a poor diet, suggesting that fewer of the households in this age group were on the borderline. Regarding the districts, it was found that more households with poor diets were found in Waterberg District, followed by households from Mopani District (Table 7). Households from Capricorn District consumed high diversity, and this was followed by households from the Vhembe and Sekhukhune districts, where 41% of the households was each found to be within the acceptable diets. Many households from the different districts are also on the borderline, which is a concern as those households may fall into poor diets unless things change for the better and they move on to fall into acceptable diets.

Table 40: Food Consumption Score by sex, age of household head, and district

		Poor		Borderline		Acceptable	
		Number	%	Number	%	Number	%
Sex	Male	193	41	142	23	211	35
	Female	267	35	174	27	294	38
Age	18-24	8	48	8	10	19	42
	25-34	44	36	29	28	42	36
	35-44	71	41	37	22	77	37
	45-54	75	36	67	22	88	41
	55-64	95	35	65	27	114	38
	65+	150	37	97	31	143	32
District	Capricorn	102	35	49	22	112	43
	Sekhukhune	90	36	77	23	129	41
	Mopani	90	37	71	27	111	36
	Vhembe	130	30	114	29	170	41
	Waterberg	104	41	65	29	75	30

7.5**Relationship between household food security situation and socio-economic factors**

Household food security varies according to demographics, socio-economic characteristics, and support levels. This section presents results investigating the extent to which food security status of households differs according to several factors. For this analysis, the HFIAS categories were merged into a binary food security status variable, indicating whether a household was food secure or food insecure. The three food insecurity categories (i.e., mild, moderate, and severe levels) were all captured as food insecure. Table 41 presents the results. The table shows that significant relationships were found between household food security status and some demographics and socio-economic factors such as gender, age of household heads/ acting head, access to irrigation, improved water source, sanitation, social grants, household size, markets, education level of household head/ acting head, and involvement in agricultural production.

Table 41: Relationship of food security and socio-economic factors

Variables	Categories	Food security status		t/ Chi-square tests
		Food secure	Food insecure	
HH Sex	Male	53.9	44.9	***
	Female	46.1	55.1	
HH age group	18-24	5.8	3.6	***
	25-34	8.8	9.2	
	35-44	15.8	18.1	
	45-54	18.2	18.6	
	55-64	14.1	15.7	
	65+	37.3	34.9	

Variables	Categories	Food security status		t/ Chi-square tests
		Food secure	Food insecure	
Marital status	Married	50.5	54.9	***
	Unmarried	49.5	45.1	
District	Capricorn	51.3	43.7	***
	Sekhukhune	65.7	34.3	
	Mopani	42.4	57.6	
	Vhembe	43.6	56.4	
	Waterberg	47.6	52.4	
HH education level	No schooling	6.5	12.1	***
	Primary	17.5	14.4	
	Matric	55.5	59.0	
	Tertiary	20.5	14.4	
Household size		4.73	4.58	***
HH employment status	Employed	79.9	20.1	***
	Unemployed	74.5	25.5	
Urban status	Farms	88.7	11.3	***
	Traditional	41.4	58.6	
	Urban	48.5	51.5	
Access to social grants	Beneficiary	0.52	0.47	
	Non-beneficiary	0.49	0.51	
Access to land	Yes	0.53	0.47	***
	No	0.40	0.59	
Involved in farming activities	Yes	0.58	0.42	***
	No	0.27	0.73	
Access to irrigation	Yes	45.4	54.6	***
	No	36.1	63.9	
Access to extension	Yes	91.4	8.6	***
	No	86.2	13.8	
Access to markets	Yes	86.2	13.8	***
	No	91.4	8.6	
Access to road infrastructure	Yes	92.8	7.2	***
	No	81.7	18.3	
Access to improved water sources	Yes	95.1	4.9	***
	No	90.9	9.1	
Access to improved sanitation	Improved sanitation	0.34	0.65	***
	Unimproved	0.58	0.42	

Table 41 above shows that female headed households were significantly more likely to be food insecure than male-headed households. More than half (55%) of the households in the food insecure category were female-headed. This result is not unexpected, as females generally have disadvantages in accessing productive resources in traditional communities due to, among others, the historical formulation and implementation of patrilineal laws and cultural traditions, including laws that limit females' inheritance of productive assets such as land. Further, there is often social and administrative bias towards males, as well as unequal access to education, extension, training, information, and inputs, which limits the livelihood options for females, thus compounding the food security plight of their households. The age of a household head also significantly varied with the food status of their household. The relationship seems to be non-linear, with households headed by the youngest (18-24 years) and oldest households (65+ years) appearing more in the food insecure group than they do in the food secure group. This finding was not expected, since one would expect the household heads in their late 30s and early 50 years to have access to more opportunities than those younger or older.

Households in the food secure category had more household members than those in the food insecure category, and this difference was statistically significant. On the one hand, one would have expected that food insecure households to have more members than the food secure ones. This is because more members imply more mouths to feed, thus a greater burden than in smaller ones. On the other hand, more household members indicate higher availability of labour. In farming communities, where labour is generally supplied by family members, bigger households are more likely to produce more because of the relatively easier access to labour. Further, labour availability also means the households engage in more diversified livelihood portfolios, reducing the chances of complete livelihood failure during shocks such as droughts, or pandemic-induced lockdowns.

The table shows a positive and significant relationship between the education level of heads of household and household food security. Educated people have higher opportunities and higher chances of success in their endeavours, which leads to higher welfare. Also, higher education among farming communities, such as those in Limpopo, could lead to better information access and assimilation, which may increase awareness of the possible advantages of modernizing agriculture by means of technological inputs or simply taking advantage of opportunities arising in the area. This leads to higher productivity, food production, and incomes.

As expected of rural provinces such as Limpopo, households which are involved in agriculture have a high chance of being food secure, indicating that farming plays a significant role in improving food security and other livelihoods outcomes in Limpopo. This is especially so, if these households have access to land, irrigation, and markets - which were also positively associated with higher chances of food security. Similarly, the results show that employment was positively and significantly associated with food security.

Access to safe water and sanitation are important development goals and are among the most basic human necessities. A community that has safe drinking water, good sanitation and good hygiene is less likely to be affected by water-borne diseases such as diarrhoea, dysentery, cholera, typhoid, worms, and trachoma. The analysis showed a significant positive relationship between household food security and access to improved water sources. There is, therefore, a need for government to expand programmes and projects that provide safe water, such as tap water and boreholes in communities, and make an effort to ensure that each South African has access to safe drinking water.

Improved sanitation facilities are facilities that ensure hygienic separation of human excreta from human contact. They include flush or pour-flush toilet or latrine, piped sewer system, septic tank pit latrine, ventilated improved pit (VIP) latrine, pit latrine with slab, and composting toilet. The results showed that water and sanitation have a significant positive role in household food security. Progress in the WASH sector is assessed through the level of access to WASH services, and the quality and functionality of those services. Equity analyses focus on the degree to which progress in WASH has been pro-poor, and the allocation of budget in relation to need and location. Among the areas that need improvements in the sector are coordination and improved service delivery. Communities indicated that there is also limited consultations by government

and development partners during the development of WASH programmes and interventions. This results in limited alignment of partner projects with district priorities. For example, some partners support sanitation and hygiene activities falling under their project impact areas, and not district sanitation and hygiene priority areas. About two-thirds of the challenges reported were in the areas of coordination and delivery of WASH interventions. The results suggest that there is a need for government to promote projects and programmes that provide and encourage access to improved water sources and good hygiene practices such as the use of latrines and washing hands with soap after using the toilet.

7.6 Discussion

The food security situation in Limpopo Province has been a cause for concern for several years, and yet the challenge continues. The food access indicators have shown that a significant proportion of households face challenges in accessing food, with the Household Food Insecurity Access Score (HFIAS), showing that more than half of the households (59%) in Limpopo Province experienced food insecurity, with only 41% found to be food secure. This figure is marginally higher when compared with previous studies, such as De Cock et al. (2013), who reported that 53% of the sampled households were food insecure in a study of food security in Limpopo Province. The HFIAS also showed that 11% of the households were severely food insecure, 29% of the surveyed households were moderately food insecure, while 19% of the households were mildly food insecure. This household food security situation is not strange, bearing in mind that the data was collected three weeks after the first lockdown due to the COVID-19 pandemic. This implies that the lockdown affected both food availability and access in the study area. In a study focusing on rural communities in Limpopo Province, De Cock et al. (2017) found that 14.8% of the people from the sample were food secure, 5.8% were mildly food insecure, 26.4% were moderately food insecure, and 53.1% were severely food insecure. The higher food insecurity figures reported in De Cock et al. (2017) are possibly because the study only focussed on rural communities which are traditionally more food insecure, hence you would expect higher food insecurity levels there.

Overall, our results are in line with most of the food security findings which generally indicate that a significant proportion of households experience food access challenges in South Africa. For example, the 2021 Global Food Security Report indicated that during the 2018-20 period, 45% of the population in South Africa were characterised by moderate food insecurity, and 19% experienced severe food insecurity. These results are also at variance with results reported from the Limpopo Province study by Ntila et al. (2017), where severe food insecurity among children of 87% and 78% in rural and peri-urban were observed, respectively. This scenario may be realistic since children in both rural and urban areas do not get enough balanced foods required for growth and body building. Another possible reason for the disparity could be that Ntila et al. (2017) used the Children's Food Insecurity Access Scale (CFIAS) unlike the HFIAS that was used in the NFNSS study.

In addition, the results of the food security status as measured by the Household Hunger Scale (HHS) showed that most of the sampled households experienced little to no hunger (85%). About 12% and 4% of the households experienced moderate hunger and severe hunger, respectively (Figure 49). While a significant proportion of households experienced food insecurity (as shown by the HFIAS results), the HHS suggests that the level of food deprivation is not very severe for most of the households in Limpopo Province. Also, emerging results from the household survey indicate that 87% of the male-headed households experienced little to no hunger, compared to 82% of the female-headed households. This situation indicates that there is a need for interventions tailor made for female-headed households, to assist them to escape food insecurity. Likewise, the moderate and severe hunger in the households were slightly more experienced by female headed households compared to male-headed households. This is similarly echoed by results from a study in the Limpopo Province, where women-headed households experienced hunger.

The Food Consumption Score (FCS) revealed that most households (38%) were consuming adequately (acceptable) diversified diets, and about 26% of households are at the borderline and could fall into unacceptable diversity of foods if no actions are taken to help them improve their diets. Waterberg and Mopane districts were the worst in dietary diversity score whilst Capricorn, Vhembe, and Sekhukhune districts had the most

acceptable food consumption scores, in that order. This is largely because Capricorn District is mostly urban and food is mostly accessed from urban markets, which have diverse foods, and Vhembe District households produces a variety of food including cereals, fruits, and vegetables. However, it is important for the government to develop interventions that enhance access to diverse foods in most of the districts since 26% of them are on the borderline; they are likely to fall into the category of poor FCS. A previous national survey in 2009 (Labadarios, Steyn & Nel, 2011) found the mean DDS to be 4.02 with 38% of the population having a DDS of less than 4. These results are in sharp contrast to the NFNSS results, which report a high percentage (83.4%) of the households in Limpopo having an HDD above 6, indicating that they consumed high levels of diverse foods. The variance could be because Labadarios, Steyn & Nel (2011) was a national study which included other provinces other than Limpopo. In terms of studies in other developing countries, which have evaluated dietary diversity, a mean DDS of 4.9 was found in Filipino children 24-71 months of age using the same number of food groups as in the present survey (Kennedy, Pedro, Seghieri et al. 2009). In sharp contrast to the NFNSS HDD results, in Burkino Faso, a score of 4.6 was found; 3.3 in northern Uganda, and 5.2 in Laos (Kennedy, Pedro, Seghieri et al., 2009). It appears that poor dietary variety is a feature of many developing countries; however, in the Limpopo Province of South Africa, there is a high diversity of food groups consumed by most households.

The most popular food groups consumed were cereals, condiments, vegetables, and sugars - in that order - whilst the least consumed food groups were pulses and nuts, fish and seafood, tubers, and eggs. This is largely because cereals and sugars are cheap food stuffs whilst pulses, fish, eggs, and sea foods are relatively expensive to purchase. In addition, pulses, fish, eggs, and sea foods are not commonly produced across the five districts of the Limpopo Province. The proposed interventions also need to take into consideration that male-headed households have a poor dietary diversity consumption score. This is possibly attributable to the critical care giver role that females play within the households since they are primarily responsible for food preparing and feeding of household members.

Individual Nutrition Status

This section highlights the status of infant feeding practices and the nutritional status of children aged 0-5 years in the study area, as well as the nutritional status of selected individuals aged 18 years and older.

8.1 Child Nutrition

South Africa adopted the WHO feeding guidelines, which recommended that infants should be exclusively breastfed until 6 months of age (WHO, 2006; DoH, 2011). It is important to have data on breastfeeding and complementary feeding since this can provide information on the child's growth and immunity and may also explain certain disease conditions. Exclusive breastfeeding for 6 months is particularly important because it provides the best immunity against infectious diseases and, furthermore, decreases the likelihood of the development of gastrointestinal diseases resulting from feeding from bottles which are not properly clean or from infant formula which has not been correctly mixed. Exclusive breastfeeding is encouraged by putting the baby to the breast as soon as possible after giving birth, and by not providing any fluid other than breast milk. The longer this is delayed, the less chance there is of exclusive breastfeeding taking place. It is recommended that semi-solid foods should not be introduced to exclusive breastfeeding infants before 6 months of age since breast milk meets all nutritional requirements; and to infants on other feeding regimes at 4 months of age. Introducing solids too late can also be harmful since infants may not meet all their energy and nutrient requirements.

8.1.1 Infant feeding practices

Breastfeeding status

Data was recorded for a total of 194 children. Of those aged 0-11 months (n=95), 81.6% were ever breastfed, while 89.4% were breastfeeding at the time the survey was conducted. In children aged 12-24 months (n=99), 93.1% were ever breastfed, while 43.3% were breastfeeding at the time the survey was conducted (Table 42). Exclusive breastfeeding was reported in 11.6% of all children aged 0-6 months. Reports of between 76.8% and 89.0% were recorded for children that were ever breastfed across all districts with no significant differences between districts. Capricorn District reported the lowest number of children (47.9%), and Sekhukhune reported the highest number (68.1%) currently breastfeeding. However, there were no significant differences between districts. When disaggregating by district, results should be interpreted with caution as the sample sizes in some districts were small (n<30).

Table 42: Breastfeeding status among infants aged 0-24 months in Limpopo

	Ever been breastfed			Currently breastfed ¹			Exclusively breastfed (0-6 months)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Age (months)									
0-11 months	81.6	[68.2-90.2]	95	89.4	[81.3-94.3]	79			
12-24 months	93.1	[85.3-96.9]	99	43.3	[27.5-60.7]	88			

	Ever been breastfed			Currently breastfed ¹			Exclusively breastfed (0-6 months)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Gender									
Male	92.3	[78.5-97.5]	30	*	*	25#	*	*	9#
Female	93.3	[75.6-98.4]	34	67.2	[45.8-83.2]	32	*	*	5#
Total	92.8	[82.0-97.3]	65	71.5	[51.0-85.8]	58	*	*	15#
District - LP									
Mopani	89.0	[68.2-96.8]	52	61.3	[46.9-74.0]	45	*	*	9
Vhembe	*	*	18#	*	*	17#	*	*	4
Capricorn	80.9	[66.3-90.1]	49	47.9	[28.8-67.7]	42	*	*	12#
Waterberg	*	*	29#	*	*	29#	*	*	6
Greater Sekhukhune	76.8	[64.5-85.8]	46	68.1	[53.3-80.0]	34	*	*	9
Total	87.5	[80.5-92.2]	194	64.4	[52.2-74.9]	167	11.6	[4.8-25.4]	40

¹ among those ever breastfed

* cell sample sizes too small to generate a reasonable estimate

n<30

Time lapsed until the introduction of breastfeeding

In most infants aged 0-24 months, (n=167), breastfeeding was introduced immediately (76.4%), within the first hour (9.1%) or within 24 hours (7.9%) (Table 43). Only in 1.6% of cases was breastfeeding introduced more than 24 hours after birth. There were no significant differences reported between children aged 0-11 months and 12-24 months. Neither were there any significant differences reported between male and female children.

Mopani reported the lowest rates (68.3%) of children to have been introduced to breastfeeding immediately, compared to Sekhukhune, who reported the highest rate (90.6%). Overall, though, there were no significant differences in the time lapsed until the introduction of breastfeeding across all districts.

Table 43: Time lapsed until the introduction of breastfeeding among infants aged 0-24 months in Limpopo

	Immediately		Less than one hour		Less than 24 hours		More than 24 hours		Don't know		n
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Age											
0-11 months	75.9	[61.5-86.2]	13.2	[5.4-28.8]	4.3	[1.6-10.7]	3	[0.7-11.8]	3.7	[1.1-12.0]	79
12-24 months	76.9	[54.7-90.1]	5.7	[2.4-13.0]	10.9	[2.0-42.4]	0.5	[0.1-3.7]	6	[1.3-24.1]	88
Gender											
Male	*	*	*	*	*	*	*	*	*	*	25#
Female	80.2	[60.0-91.6]	14.2	[5.2-33.3]	1.5	[0.2-10.4]	0	-	4.1	[0.5-25.6]	31
Total	75.4	[47.8-91.1]	15.9	[6.9-32.5]	0.7	[0.1-5.1]	0	-	8.1	[1.8-29.3]	57

	Immediately		Less than one hour		Less than 24 hours		More than 24 hours		Don't know		n
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
District – LP											
Mopani	68.3	[55.6-78.7]	18.7	[10.6-30.8]	6.5	[1.9-19.9]	1.3	[0.2-8.8]	5.2	[1.4-18.0]	45
Vhembe	*	*	*	*	*	*	*	*	*	*	17#
Capricorn	71	[36.7-91.2]	4.8	[1.2-17.7]	22.2	[4.8-61.9]	2	[0.2-14.3]	0		41
Waterberg	*	*	*	*	*	*	*	*	*	*	29#
Sekhukhune	90.6	[69.6-97.6]	0		0		4.8	[0.7-25.1]	4.7	[0.6-28.8]	35
Total	76.4	[61.3-86.9]	9.1	[4.6-17.3]	7.9	[2.1-25.1]	1.6	[0.5-5.4]	5	[1.7-13.6]	167

* cell sample sizes too small to generate a reasonable estimate

n<30

8.1.1.1 Age at which breastfeeding was stopped

In children aged 0-24 months, breastfeeding was most often stopped between the ages of 3-4 months (34.4%). A further 12.2% of mothers stopped breastfeeding at 5-6 months, and by 7-12 months, 26.5% more mothers stopped breastfeeding (Figure 55). Fifteen percent of mothers stopped breastfeeding before 3 months, while 2.1% of mothers continued to breastfeed for nearly 2 years. No significant differences were found when disaggregating the data by districts.

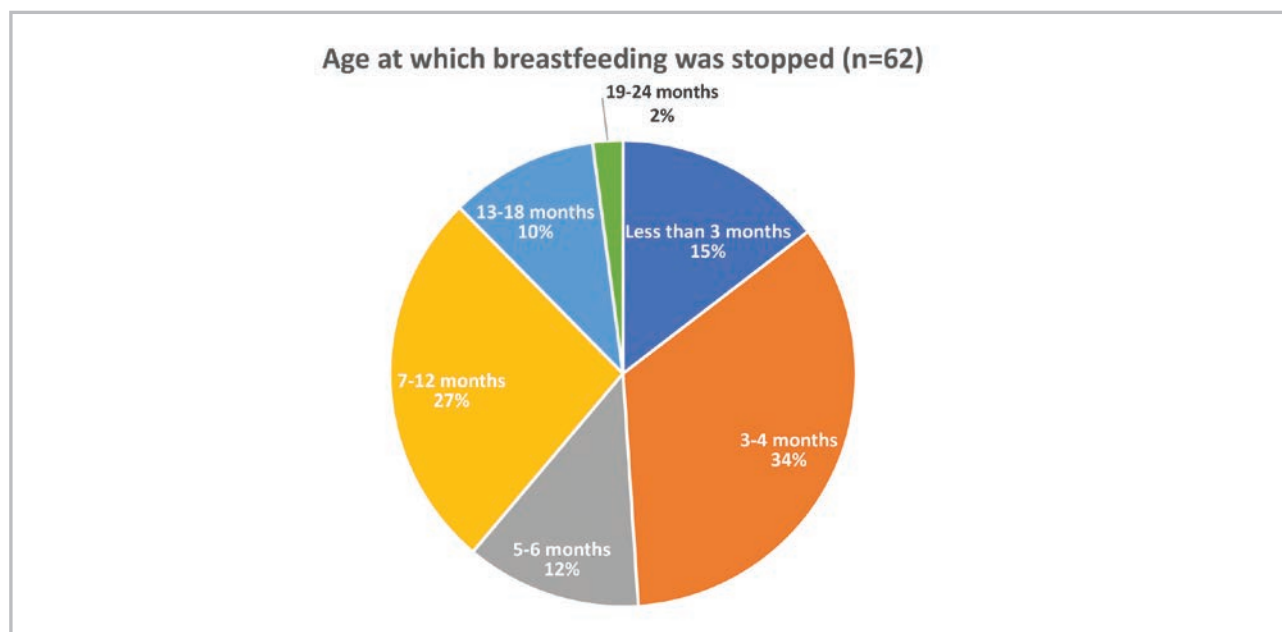


Figure 55: Age at which breastfeeding was stopped among infants aged 0-24 months in Limpopo

8.1.1.2 First drink other than breastmilk

Infant formula (41.8%) and plain water (34.0%) were reported to be the most common first drink other than breastmilk that was introduced to infants under 2 years of age (Figure 56). There were no significant differences between children aged under and over 12 months. Similarly, no significant differences were found between male and female children.

First drink other than breastmilk in children aged 0-24 months

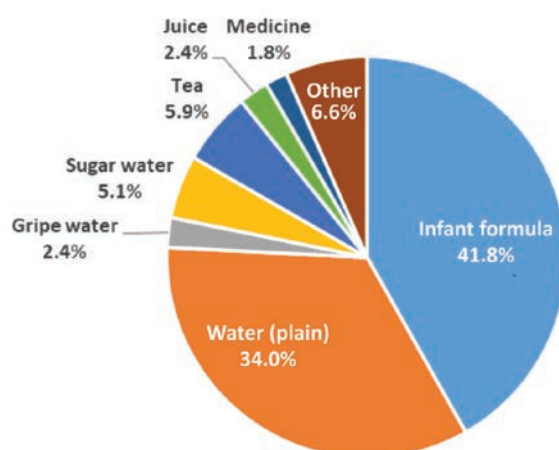


Figure 56: First drink other than breast milk in children aged 0-24 months in Limpopo

All districts reported infant formula (>40%), followed by water (>25.0%) as the first drink other than breastmilk that was introduced to children aged 0-24 months (Table 44). Other drinks such as gripe water, sugar water, juice, tea, and medicine were reported as first drinks by less than 10.7% of mothers across all districts, with no significant differences between districts. It is important to note, though, that the results for Vhembe and Waterberg could not be shared due to the small sample size in these districts (n=14 and n=28, respectively).

Table 44: The first drink other than breast milk among children aged 0-24 months by district in Limpopo

	Infant formula		Water (plain)		Gripe water		Sugar water		Tea		Juice		Medicine		Other		n
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI			
District - LP																	
Mo-pani	42.4	[23.4-63.8]	34,4	[13.9-63.0]	0,7	[0.1-5.5]	1,2	[0.2-7.7]	9,6	[5.0-17.7]	0,6	[0.1-4.7]	2,9	[0.6-12.7]	8,3	[3.9-16.8]	52
Vhem-be	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	14#
Capri-corn	48.1	[32.0-64.6]	29,6	[10.6-59.7]	1,1	[0.2-5.8]	1,6	[0.2-11.8]	10,7	[2.9-32.8]	7,2	[1.1-35.3]	1,2	[0.2-7.5]	0,6	[0.1-4.6]	48
Water-berg	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	28#
Greater Sekhu-khune	59.3	[38.4-77.4]	25,2	[12.7-43.7]	9,5	[2.1-33.5]	0		2,1	[0.4-9.6]	0		0		3,8	[0.6-20.3]	43
Total	41.8	[31.9-52.4]	34	[23.3-46.6]	2,4	[0.8-7.1]	5,1	[1.7-14.4]	5,9	[2.5-13.4]	2,4	[0.4-13.8]	1,8	[0.7-4.7]	6,6	[3.1-13.5]	185

* cell sample sizes too small to generate reasonable estimate

n<30

8.1.1.3 Age at which the first drink other than breastmilk was introduced

Overall, the first drink other than breastmilk was mainly introduced at 0-1 month. This occurred in a higher proportion of children aged 0-11 months (53.6%), compared to the children aged 12-24 months (32.4%) (Table 45). We can assume that this is most likely the introduction of infant formula. At 6 months, other drinks were introduced in 19.2% of children, with less than 10% being introduced to other drinks between 2-5 months of age. The same pattern was seen across all districts; however, there was a significant difference between Greater Sekhukhune where a higher proportion (77.6%) of infants were introduced between 0-1 month compared to Mopani (43.9%) and Capricorn (29.9%). It is important to note, though, that the results for Vhembe and Waterberg could not be shared due to the small sample sizes in these districts (n=13 and n=27, respectively).

Table 45: Age at which the first drink other than breastmilk was introduced among infants aged 0-24 months in Limpopo

	0-1 month		2 months		3 months		4 months		5 months		6 months		>6 months		n
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Age															
0-11 months	53.6	[39.7-66.9]	7.9	[3.4-17.3]	6.6	[3.2-13.1]	11.5	[5.7-21.8]	3.5	[0.7-15.7]	15.6	[6.6-32.6]	1.4	[0.3-6.3]	87
12-24 months	32.4	[19.9-48.1]	11.7	[2.6-40.4]	5.4	[2.5-11.4]	7.4	[2.0-24.4]	2.7	[0.8-8.5]	22.5	[9.7-43.9]	17.7	[10.0-29.4]	93
Gender															
Male	48.8	[26.5-71.6]	2.5	[0.5-11.6]	4.6	[1.0-18.2]	6.6	[1.2-28.4]	7.1	[1.3-31.8]	22.7	[5.9-57.9]	7.7	[1.7-28.7]	31
Female	23.2	[10.9-42.7]	5.8	[1.5-20.3]	4.9	[1.5-14.7]	12.4	[3.2-37.8]	5.8	[1.4-21.8]	32.4	[11.4-64.1]	15.5	[6.3-33.5]	32
Total	37.7	[22.5-55.8]	3.9	[1.3-11.1]	4.7	[1.8-12.0]	9.1	[3.1-23.7]	6.6	[2.0-19.8]	26.9	[9.7-55.8]	11.1	[4.6-24.5]	63
District - LP															
Mopani	43.9	[29.5-59.3]	7.9	[1.9-27.5]	12.3	[4.7-28.8]	5.5	[1.8-15.3]	6.2	[0.9-33.1]	7.8	[2.5-21.9]	16.3	[8.7-28.5]	51
Vhembe	*	*	*	*	*	*	*	*	*	*	*	*	*	*	13#
Capricorn	29.9	[17.7-45.8]	20.3	[4.8-56.1]	6.8	[2.5-17.0]	16.5	[4.4-45.9]	5.6	[1.9-15.7]	12.9	[4.2-33.5]	8.0	[3.1-19.4]	46
Waterberg	*	*	*	*	*	*	*	*	*	*	*	*	*	*	27#
Greater Sekhukhune	77.6	[65.2-86.4]	0.7	[0.1-4.8]	1.8	[0.4-8.6]	6.4	[1.7-21.2]	0		7.4	[2.9-17.6]	6.1	[1.6-20.7]	43
Total	42.7	[32.3-53.8]	9.9	[3.6-24.2]	6.0	[3.3-10.6]	9.4	[4.1-20.2]	3.1	[1.1-8.6]	19.2	[9.6-34.6]	9.8	[5.8-16.2]	180

* cell sample sizes too small to generate reasonable estimate# n<30

8.1.1.4 Milk feeds

The mean age at which milk feeds were introduced to children was higher in children aged 12-24 months (4.6) as compared to children aged 0-11 months (2.1) (Table 46). Small sample sizes did not allow for further analyses on this item.

Table 46: Mean age at introduction of milk feeds among infants 0-24 months old in Limpopo

	Mean	95% CI	n
Age			
0-11 months	2,1	[1.5-2.7]	48
12-24 months	4,6	[2.9-6.4]	35
Total	3,1	[2.2-4.0]	83
Gender			
Male	*	*	11#
Female	*	*	13#
Total	*	*	24#
District - LP			
Mopani	*	*	23#
Vhembe	*	*	5#
Capricorn	*	*	28#
Waterberg	*	*	4#
Sekhukhune	*	*	23#
Total	3,1	[2.2-4.0]	83

* cell sample sizes too small to generate reasonable estimate

n<30

With the exception of breastmilk, the majority of infants (23.6%) were receiving infant formula, with 9.4% receiving other milk and only 2.2% receiving full strength cow's milk. The latter was only found in children aged 12-24 months (Table 47). *These results do have to be interpreted with caution, though, due to the small sample sizes.*

Table 47: The type of milk other than breast milk that the infant receives (among infants aged 0-24 months who are receiving milk feeds)

	Cow's milk (full strength)		Cow's milk (diluted)		Goats milk		KLIM / Nespray		Infant formula (name)		Other		n
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Age													
0-11 months	*	*	*	*	*	*	*	*	*	*	*	*	19#
12-24 months	*	*	*	*	*	*	*	*	*	*	*	*	12#
Total	2.2	[0.3-15.1]	0		0		2.0	[0.3-13.1]	23.6	[11.2-43.1]	9.4	[2.2-32.4]	31

8.1.1.5 Solid foods

The mean age at which first semi-solid or solid foods were introduced was 4.4 months. This was significantly lower in children aged 0-11 months at 3.2 months and higher in children aged 12-24 months at 5.2 months (Table 48).

Table 48: Age at introduction of first semi-solid or solid food among infants aged 0-24 months in Limpopo

	Mean	95% CI	n
Age			
0-11 months	3.2	[2.4-4.1]	72
12-24 months	5.2	[4.5-5.9]	97
Gender			
Male	*	*	29#
Female	5.1	[3.9-6.2]	32
Total	4.7	[4.0-5.4]	61
District - LP			
Mopani	3.5	[2.4-4.6]	49
Vhembe	*	*	15#
Capricorn	4.4	[3.6-5.3]	40
Waterberg	*	*	27#
Greater Sekhukhune	3.9	[3.1-4.8]	38
Total	4.4	[3.9-4.8]	169

* cell sample sizes too small to generate reasonable estimate

n<30

Table 49 shows that commercial infant cereal was the first semi-solid food given to the majority of children aged 0-24 months (42.9%), followed by homemade infant cereal/porridge (33.6%). There were no significant differences between infants aged 0-11 and 12-24 months. Less than 4.0% of infants had cereal / porridge supplied by the clinic, pureed / mashed vegetables, bottled/ canned baby foods and traditional foods as their first semi-solid foods, while 15.9% of mothers reported other foods as their infants' first food.

Infants in Capricorn (59.2%) and Sekhukhune (47.5%) districts were more likely to have commercial infant cereals as their first foods, while those in Mopani (57.7%) were significantly more likely to have homemade infant cereal as their first foods. It is important to note, though, that the results for Vhembe and Waterberg could not be shared due to the small sample sizes in these districts (n=16 and n=27, respectively).

Table 49: Age of introduction of first semi-solid or solid food and the types of foods among infants 0-24 months in Limpopo

	First semi-solid or solid food (with a spoon or fingers)														n
	Infant Cereal / Porridge (commercial)		Cereal / Porridge (homemade)		Cereal / Porridge (clinic)		Pureed / mashed vegetables / fruit		Bottled / canned baby foods		Traditional baby food		Other (specify)		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Age															
0-11 months	34.7	[21.9-50.2]	28.2	[15.9-44.9]	5.8	[1.1-24.8]	0		0.3	[0.0-1.9]	1.2	[0.2-8.1]	29,8	[16.9-47.1]	85
12-24 months	50.3	[35.5-65.1]	38.4	[26.8-51.5]	1.1	[0.1-7.4]	0.8	[0.2-3.5]	0.1	[0.0-0.7]	5.9	[2.1-15.6]	3,4	[1.0-10.8]	97

	First semi-solid or solid food (with a spoon or fingers)														
	Infant Cereal / Porridge (commercial)		Cereal / Porridge (homemade)		Cereal / Porridge (clinic)		Pureed / mashed vegetables / fruit		Bottled / canned baby foods		Traditional baby food		Other (specify)		
Gender															
Male	24.1	[10.4-46.5]	36.5	[19.1-58.2]	10.3	[1.7-42.5]					6.5	[1.1-29.7]	22,6	[8.8-46.8]	30
Female	51.4	[26.7-75.5]	41.7	[19.3-68.1]	0						1.6	[0.2-11.5]	5,3	[1.0-22.9]	31
Total	36.1	[22.3-52.7]	38.6	[26.3-52.5]	5.7	[1.0-26.7]					4.3	[0.9-17.6]	15,3	[6.6-31.5]	62
District - LP															
Mopani	24.5	[14.7-37.8]	57.7	[43.5-70.6]	0		1.2	[0.2-7.9]	0		2.7	[0.3-18.0]	14	[6.8-26.8]	50
Vhembe	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16#
Capricorn	59.2	[41.9-74.5]	22.4	[12.1-37.6]	0		0		0		0		18,4	[7.8-37.3]	46
Waterberg	*	*	*	*	*	*	*	*	*	*	*	*	*	*	27#
Greater Sekhukhune	47.5	[36.0-59.3]	21.4	[12.5-34.2]	6	[0.9-31.4]	1	[0.1-7.8]	0.7	[0.1-4.7]	4.5	[1.1-15.9]	18,9	[8.7-36.3]	43
Total	42.9	[33.3-53.1]	33.6	[25.5-42.7]	3.3	[0.8-12.5]	0.4	[0.1-1.8]	0.2	[0.0-0.8]	3.7	[1.4-9.2]	15,9	[9.8-24.8]	182

* cell sample sizes too small to generate reasonable estimate

n<30

8.1.2 Anthropometry (6-59 months)

This section presents the key findings on nutritional status for children aged 6-59 months. The section presents anthropometric measures such as stunting, wasting, and underweight, which are important indicators in the assessment of child health and nutrition status. It highlights both forms of moderate and severe acute malnutrition among children under the age of five. The prevalence of malnutrition remains a public health problem which results in the substantial mortality and disease burden worldwide. The Lancet series (2013) reported that malnutrition accounts for 45% of all death of children under the age of five. This estimate translates to 3.1 million deaths globally in 2011. It is further reported that it includes intrauterine foetal growth restriction, stunting, wasting, and micronutrient deficiency, especially vitamin A and Zinc. This occurs along with poor infant feeding practices which are indicated by suboptimum breastfeeding. Data was recorded for 359 children under the age of 5 years; of these there was a slightly higher number of girls (54.6%) than boys (45.4%) (Table 50).

Table 50: Distribution of age and sex of the sample

AGE (months)	Boys		Girls		Total	
	n	%	n	%	n	%
6-17	41	44.6	51	55.4	92	25.6
18-29	43	44.8	53	55.2	96	26.7
30-41	29	41.4	41	58.6	70	19.5
42-53	37	47.4	41	52.6	78	21.7
54-59	13	56.5	10	43.5	23	6.4
Total	163	45.4	196	54.6	359	100.0

8.1.2.1 Stunting

The overall prevalence of stunting for children under the age of 5 years (n=318) was 18.3%, of which 10.0% was severe and 8.4% was moderate stunting (Table 51 and Figure 57). Results for children aged 54-59 months cannot be shown reliably due to the small sample size. There appears to be a trend showing that, generally, stunting decreases with increasing age. Severe stunting was significantly higher in the youngest age group compared to all other ages, while there were no significant differences in moderate stunting across age groups. The prevalence of both severe stunting and moderate stunting was highest in the youngest age group (6-17 months) at 29.3% and 14.2%, respectively, and lowest in the 30-41 month age group (2.8% and 2.6%), respectively.

Comparisons by gender in all children in Limpopo under 5 years of age indicated that boys had a slightly higher prevalence of stunting (18.9%) compared to girls (17.7%); however, this was not significant (Table 51 and Figure 57).

District comparisons were computed for four districts only as the sample size in one of the districts (Vhembe) was too small to generate reasonable estimates. The overall prevalence of stunting was highest in the Waterberg District (28.0%), with severe stunting at 17.3% and moderate stunting at 10.7%. This was followed closely by the Sekhukhune District (24.6%). Capricorn reported the lowest overall prevalence of stunting (5.8%), which was significantly different from that in Waterberg and Sekhukhune (Table 51 and Figure 58).

Table 51: The prevalence of Stunting in children under five years by age, sex, and district

	No stunting HAZ \geq -2		All stunting HAZ $<$ -2		Moderate stunting HAZ $<$ -2 and \geq -3		Severe stunting HAZ $<$ -3		n
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Age (months)									
6-17	56.5	[40.3-71.5]	43.5	[28.5-59.7]	14.2	[6.0-29.9]	29.3	[16.0-47.4]	81
18-29	86.7	[76.1-93.1]	13.3	[6.9-23.9]	8.7	[3.7-19.1]	4.6	[1.9-10.6]	83
30-41	94.7	[88.1-97.7]	5.3	[2.3-11.9]	2.6	[0.8-7.9]	2.8	[0.9-8.1]	65
42-53	87.9	[75.0-94.7]	12.1	[5.3-25.0]	8.7	[3.2-21.4]	3.4	[0.8-13.3]	67
54-59	*		*		*		*		22#
Total	81.7	[74.8-87.0]	18.3	[13.0-25.2]	8.4	[5.2-13.2]	10.0	[6.0-16.1]	318
Sex									
Female	82.3	[71.7-89.5]	17.7	[10.5-28.3]	11.7	[6.2-20.8]	6.0	[2.2-15.6]	173
Male	81.1	[71.4-88.0]	18.9	[12.0-28.6]	5.2	[2.8-9.5]	13.8	[7.7-23.4]	145
Total	81.7	[74.8-87.0]	18.3	[13.0-25.2]	8.4	[5.2-13.2]	10.0	[6.0-16.1]	318
District									
Mopani	81.5	[68.3-90.0]	18.5	[10.0-31.7]	6.7	[2.9-14.6]	11.8	[5.0-25.5]	81
Vhembe	*		*		*		*		12#
Capricorn	94.2	[87.7-97.3]	5.8	[2.7-12.3]	3.7	[1.5-8.8]	2.1	[0.6-7.6]	81
Waterberg	72.0	[51.9-85.9]	28.0	[14.1-48.1]	10.7	[3.4-28.8]	17.3	[6.8-37.5]	52
Sekhukhune	75.4	[62.4-85.0]	24.6	[15.0-37.6]	15.3	[8.1-27.0]	9.4	[3.7-21.5]	92
Total	81.7	[74.8-87.0]	18.3	[13.0-25.2]	8.4	[5.2-13.2]	10.0	[6.0-16.1]	318

* cell sample sizes too small to generate reasonable estimate

n<30

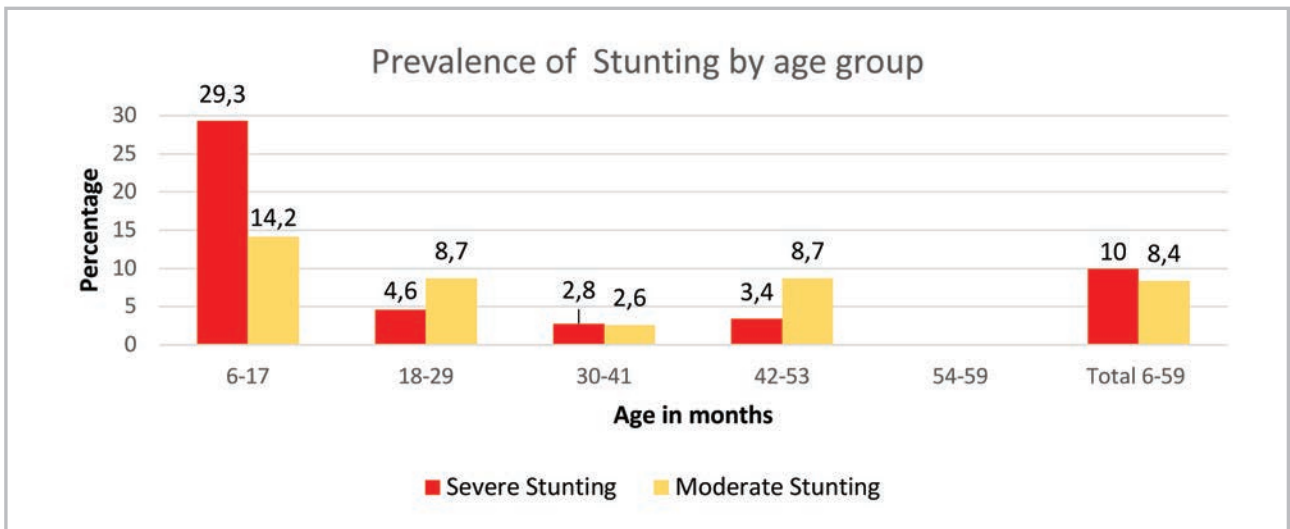


Figure 57: The prevalence of Stunting in children under five years age group

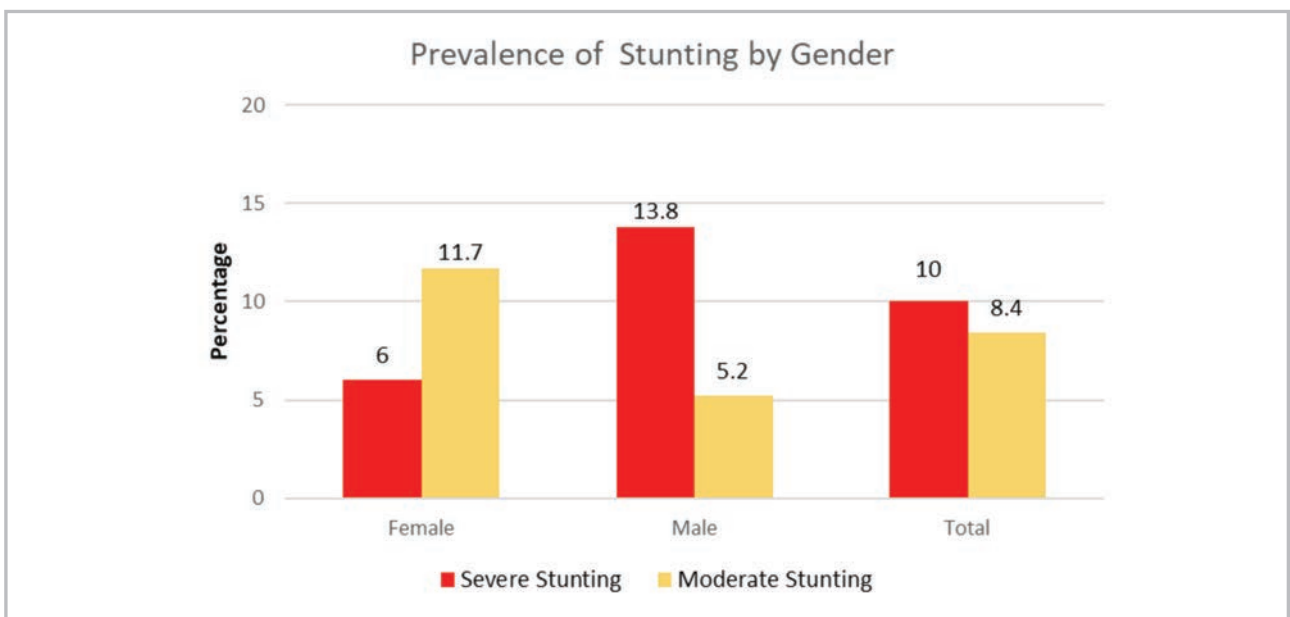


Figure 58: The prevalence of Stunting in children under 5 years by gender

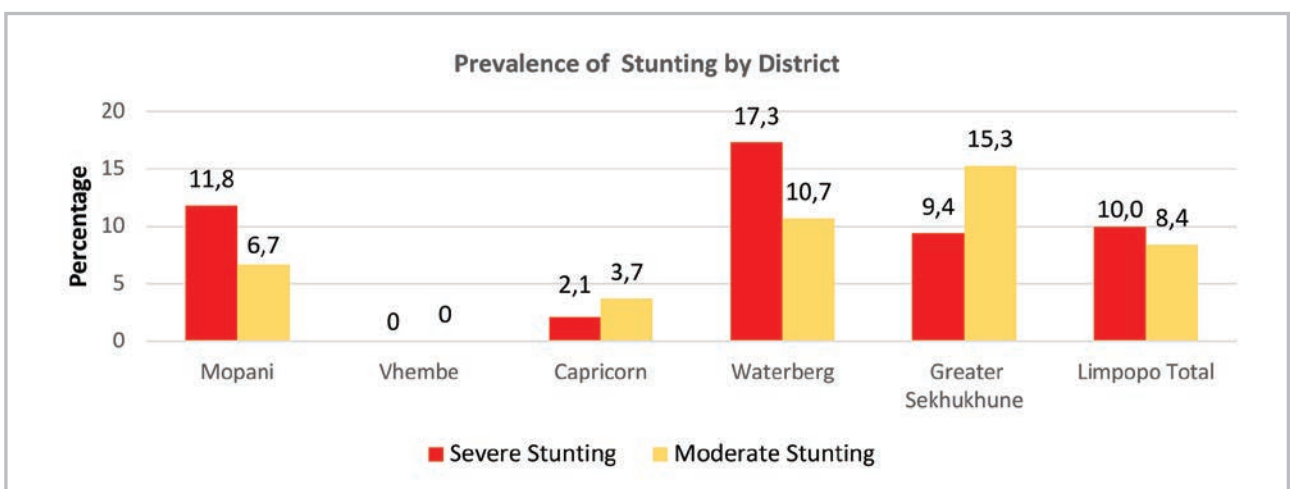


Figure 59: The prevalence of Stunting in children under 5 years in Limpopo by district

8.1.2.2 Wasting

The overall prevalence of wasting for children under the age of 5 years (n=311) was 7.7%, of which 4.3% was severe and 3.5% was moderate wasting (Table 52 and Figure 59). As with stunting, results for children aged 54-59 months cannot be shown reliably due to the small sample size. The prevalence of severe and moderate wasting was highest in children aged 6-17 months (6.4% and 6.7%, respectively). There were, however, no significant differences in all categories of wasting across age groups.

As with stunting, males had a higher prevalence of wasting (8.5%) compared to females (6.9%) (Table 52 and Figure 60). However, these differences were not significant either.

Mopani reported the highest overall prevalence of wasting (13.3%), while Capricorn reported the lowest overall prevalence (2.6%); however, there were no significant differences reported at district level (Table 52 and Figure 61).

Table 52: The prevalence of Wasting in children under five years by age, sex, and district

	No wasting WHZ \geq -2		All wasting WHZ $<$ -2		Moderate wasting WHZ $<$ -2 and \geq -3		Severe wasting WHZ $<$ -3		n
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Age (months)									
6-17	86.9	[72.1-94.5]	13.1	[5.5-27.9]	6.7	[2.2-18.4]	6.4	[1.6-22.2]	79
18-29	94.9	[85.7-98.3]	5.1	[1.7-14.3]	1.8	[0.4-8.4]	3.3	[0.8-12.8]	81
30-41	91.9	[75.3-97.7]	8.1	[2.3-24.7]	5.1	[0.8-27.0]	3.0	[1.1-8.1]	63
42-53	97.2	[89.2-99.3]	2.8	[0.7-10.8]	1.2	[0.2-8.4]	1.6	[0.2-10.4]	67
54-59	*		*		*		*		21#
Total	92.3	[86.9-95.5]	7.7	[4.5-13.1]	3.5	[1.5-8.0]	4.3	[2.1-8.6]	311
Sex									
Female	93.1	[85.8-96.8]	6.9	[3.2-14.2]	3.5	[1.3-9.0]	3.4	[1.1-10.5]	169
Male	91.5	[82.4-96.1]	8.5	[3.9-17.6]	3.5	[0.8-13.1]	5.1	[2.0-12.1]	142
Total	92.3	[86.9-95.5]	7.7	[4.5-13.1]	3.5	[1.5-8.0]	4.3	[2.1-8.6]	311
District									
Mopani	86.7	[71.8-94.4]	13.3	[5.6-28.2]	3.2	[0.6-16.6]	10.0	[3.6-24.7]	78
Vhembe	*		*		*		*		12#
Capricorn	97.4	[91.6-99.2]	2.6	[0.8-8.4]	2.6	[0.8-8.4]	0		81
Waterberg	88.9	[70.2-96.4]	11.1	[3.6-29.8]	8.2	[2.1-27.6]	2.9	[0.4-18.3]	50
Sekhukhune	96.9	[90.7-99.0]	3.1	[1.0-9.3]	0.7	[0.2-2.8]	2.4	[0.6-9.3]	90
Total	92.3	[86.9-95.5]	7.7	[4.5-13.1]	3.5	[1.5-8.0]	4.3	[2.1-8.6]	311

* cell sample sizes too small to generate reasonable estimate

n<30

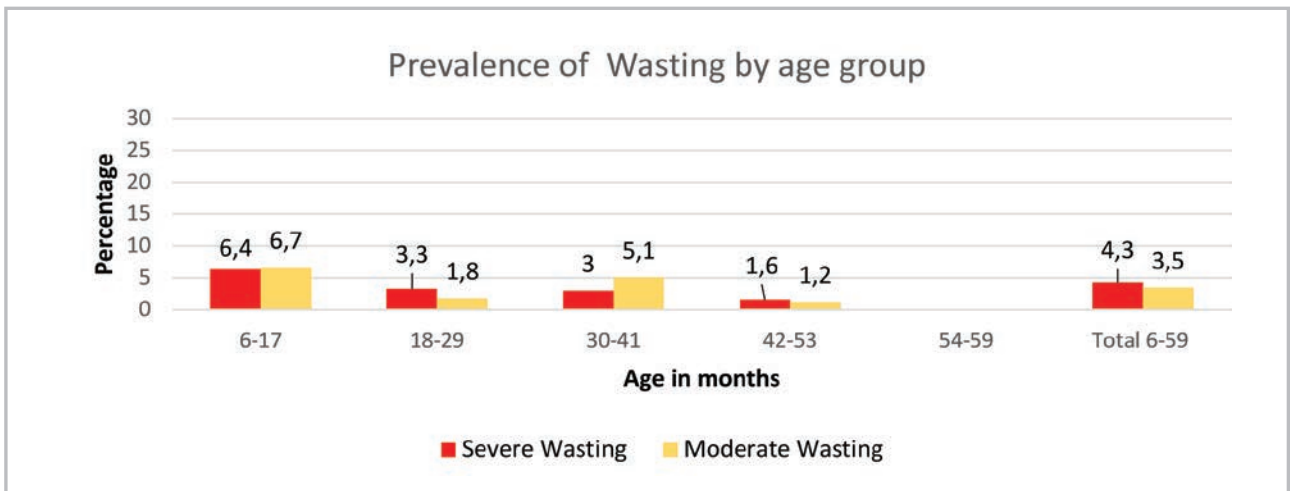


Figure 60: The prevalence of Wasting in children under 5 years by age group

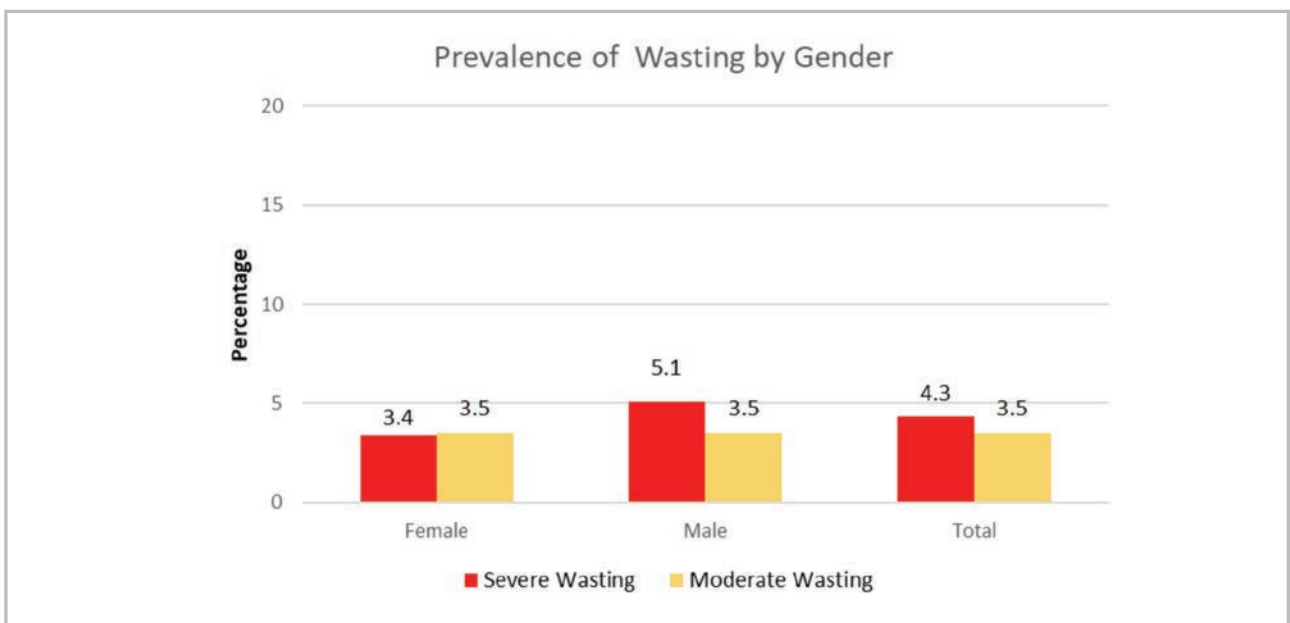


Figure 61: The prevalence of Wasting in children under 5 years in Limpopo by gender

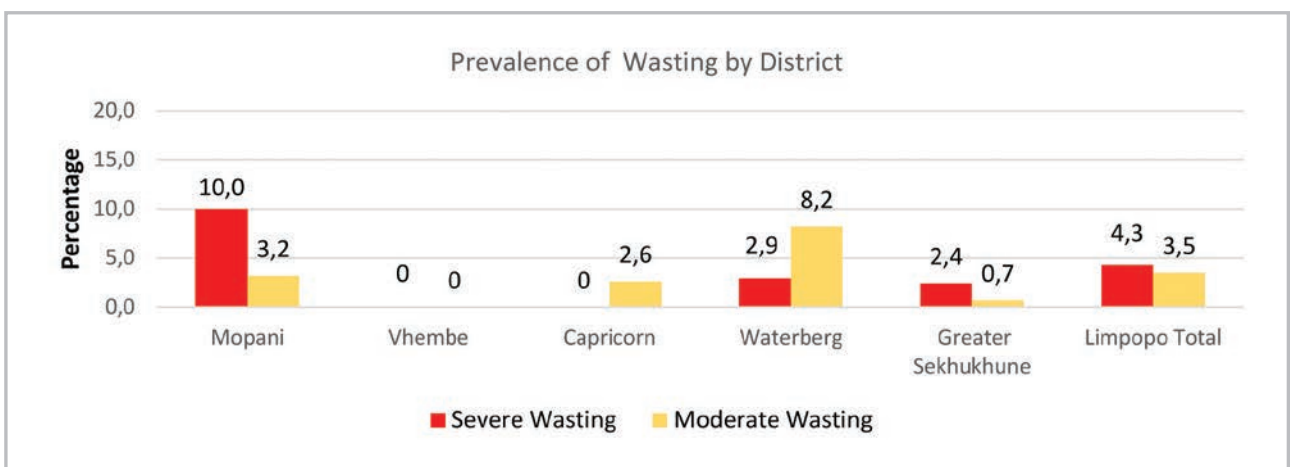


Figure 62: The prevalence of Wasting in children under 5 years by district

8.1.2.3 Underweight

The overall prevalence of underweight for children under the age of 5 years (n=328) was 11.5%, of which 6.3% was severe and 5.2% was moderate underweight (Table 53 and Figure 62). As with stunting and wasting, results for children aged 54-59 months cannot be shown reliably due to the small sample size. The prevalence of severe underweight was highest in children in the youngest age group (6-17 months) at 13.2%, while that of moderate underweight was highest in those aged 42-53 months) at 8.0%, and lowest in the 42-53 months age group (1.4%) and 30-41 month age group (0.5%), respectively. As with wasting, there were no significant differences in all categories of underweight across age groups.

The prevalence of underweight in boys (15.4%) was more than twice that in girls (7.4%); however, these differences were not significant either (Table 53 or Figure 63).

Similar to wasting, Mopani also reported the highest overall prevalence of underweight (16.6%), while Capricorn reported the lowest overall prevalence (6.8%). However, there were no significant differences in underweight reported at district level (Table 53 and Figure 64).

Table 53: The prevalence of underweight in children under five years by age, sex, and district

	Not underweight WAZ \geq -2		All Underweight WAZ $<$ -2		Moderate underweight WAZ $<$ -2 and \geq -3		Severe underweight WAZ $<$ -3		n
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Age (months)									
6-17	83.5	[68.2-92.3]	16.5	[7.7-31.8]	3.3	[0.7-13.9]	13.2	[5.5-28.6]	87
18-29	87.2	[75.1-94.0]	12.8	[6.0-24.9]	7.8	[2.9-19.3]	5.0	[1.7-14.1]	82
30-41	96.6	[91.7-98.7]	3.4	[1.3-8.3]	0.5	[0.1-3.4]	2.9	[1.0-7.7]	66
42-53	90.6	[78.1-96.3]	9.4	[3.7-21.9]	8.0	[2.8-20.7]	1.4	[0.2-9.5]	71
54-59	*		*		*		*		22#
Total	88.5	[82.9-92.4]	11.5	[7.6-17.1]	5.2	[2.9-9.3]	6.3	[3.5-11.1]	328
Sex									
Female	92.6	[85.9-96.2]	7.4	[3.8-14.1]	3.6	[1.5-8.6]	3.9	[1.4-10.0]	179
Male	84.6	[75.2-90.9]	15.4	[9.1-24.8]	6.7	[3.1-14.0]	8.6	[4.2-17.1]	149
Total	88.5	[82.9-92.4]	11.5	[7.6-17.1]	5.2	[2.9-9.3]	6.3	[3.5-11.1]	328
District									
Mopani	83.4	[70.8-91.3]	16.6	[8.7-29.2]	3.6	[1.4-8.6]	13.0	[5.9-26.2]	86
Vhembe	*		*		*		*		14#
Capricorn	93.2	[82.5-97.6]	6.8	[2.4-17.5]	5.0	[1.4-16.2]	1.8	[0.4-7.5]	84
Waterberg	88.4	[72.1-95.7]	11.6	[4.3-27.9]	5.0	[1.3-17.4]	6.6	[1.6-24.0]	54
Sekhukhune	91.9	[82.7-96.4]	8.1	[3.6-17.3]	5.7	[2.1-14.6]	2.4	[0.6-9.3]	90
Total	88.5	[82.9-92.4]	11.5	[7.6-17.1]	5.2	[2.9-9.3]	6.3	[3.5-11.1]	328

* cell sample sizes too small to generate reasonable estimate

n<30

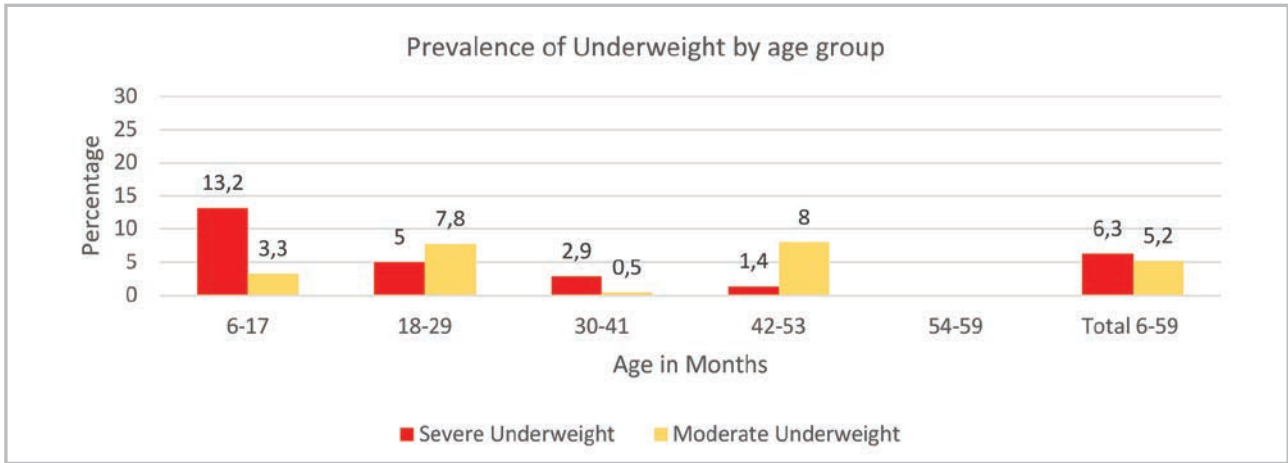


Figure 63: The prevalence of Underweight in children under five years by age group

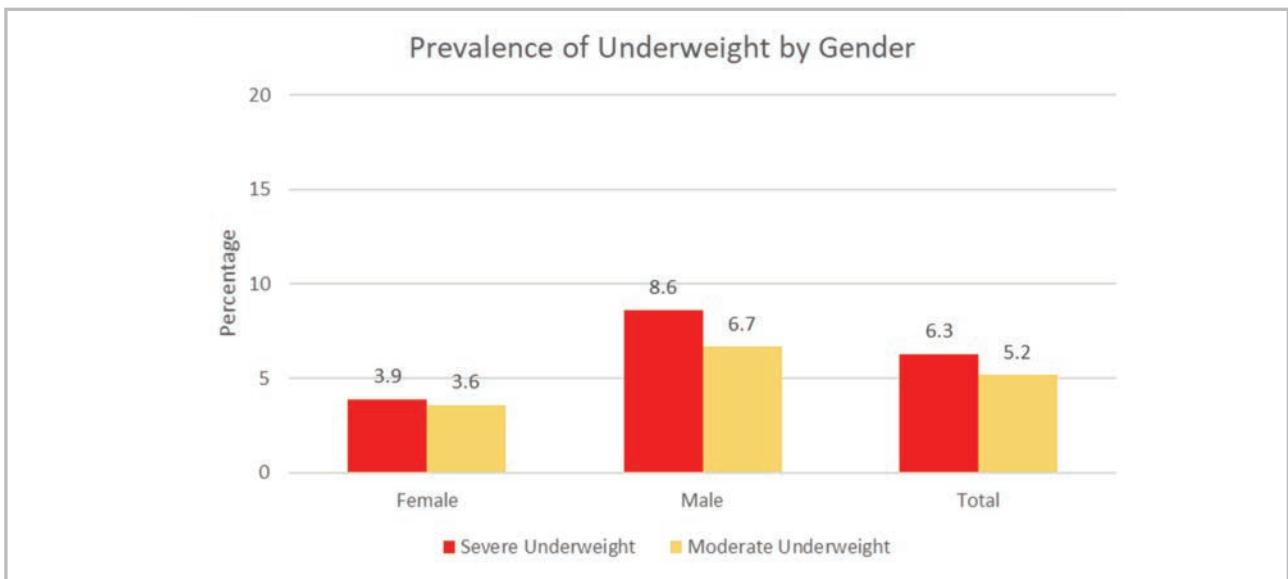


Figure 64: The prevalence of Underweight in children under five years by gender

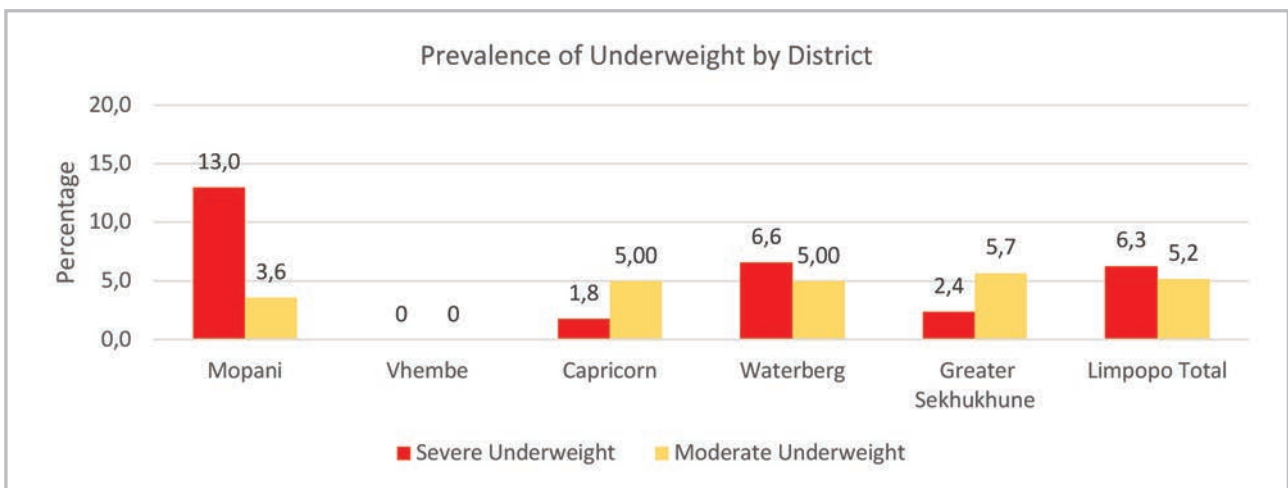


Figure 65: The prevalence of Underweight in children under five years by district

8.1.2.4 Overweight

The overall prevalence of overweight for children under the age of 5 years (n=311) was 8.6%, of which 4.7% was severe and 3.8% was moderate overweight (Table 54 and Figure 65). As with the previous indicators, results for children aged 54-59 months cannot be shown reliably due to the small sample size. The prevalence of severe and moderate overweight was highest in children in the youngest age group (6-17 months) at 14.1% and 13.4%, respectively; and lowest in older age groups, with 0% severe and moderate overweight reported in the 42-53 month and 30-41 month age groups, respectively. As with wasting, there were, however, no significant differences in all categories of overweight across age groups.

Girls had a higher prevalence of overweight (9.7%) compared to boys (7.5%) (Table 54 and Figure 66). However, these differences were not significant either.

Waterberg reported the highest overall prevalence of overweight (11.8%), while Capricorn reported the lowest overall prevalence (6.8%). However, there were no significant differences in overweight reported at district level (Table 54 and Figure 67).

Table 54: The prevalence of Overweight in children under five years by age, sex, and district

	Not overweight WHZ<2		All overweight WHZ>=2		Moderate overweight WHZ>=2 and <3		Severe overweight WHZ>=3		n
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Age (months)									
6-17	72.5	[55.7-84.7]	27.5	[15.3-44.3]	13.4	[5.2-30.3]	14.1	[6.1-29.3]	79
18-29	93.2	[85.2-97.0]	6.8	[3.0-14.8]	2.6	[0.7-8.5]	4.3	[1.5-11.6]	81
30-41	98.1	[94.2-99.4]	1.9	[0.6-5.8]	0		1.9	[0.6-5.8]	63
42-53	98.9	[92.5-99.8]	1.1	[0.2-7.5]	1.1	[0.2-7.5]	0		67
54-59	*		*		*		*		21#
Total	91.4	[86.3-94.8]	8.6	[5.2-13.7]	3.8	[1.7-8.2]	4.7	[2.5-8.7]	311
Sex									
Female	90.3	[81.7-95.1]	9.7	[4.9-18.3]	5.6	[2.0-14.8]	4.1	[1.9-8.9]	169
Male	92.5	[85.2-96.3]	7.5	[3.7-14.8]	2.2	[0.9-5.7]	5.3	[2.1-12.8]	142
Total	91.4	[86.3-94.8]	8.6	[5.2-13.7]	3.8	[1.7-8.2]	4.7	[2.5-8.7]	311
District									
Mopani	92.6	[82.5-97.1]	7.4	[2.9-17.5]	1.9	[0.5-7.0]	5.5	[1.7-16.2]	78
Vhembe	*		*		*		*		12#
Capricorn	93.2	[84.5-97.2]	6.8	[2.8-15.5]	2.4	[0.7-7.7]	4.4	[1.4-13.0]	81
Waterberg	88.2	[69.6-96.0]	11.8	[4.0-30.4]	7.9	[1.8-28.4]	3.9	[0.8-16.1]	50
Sekhukhune	89.6	[77.7-95.5]	10.4	[4.5-22.3]	3.9	[1.4-10.1]	6.6	[2.0-19.9]	90
Total	91.4	[86.3-94.8]	8.6	[5.2-13.7]	3.8	[1.7-8.2]	4.7	[2.5-8.7]	311

* cell sample sizes too small to generate reasonable estimate

n<30

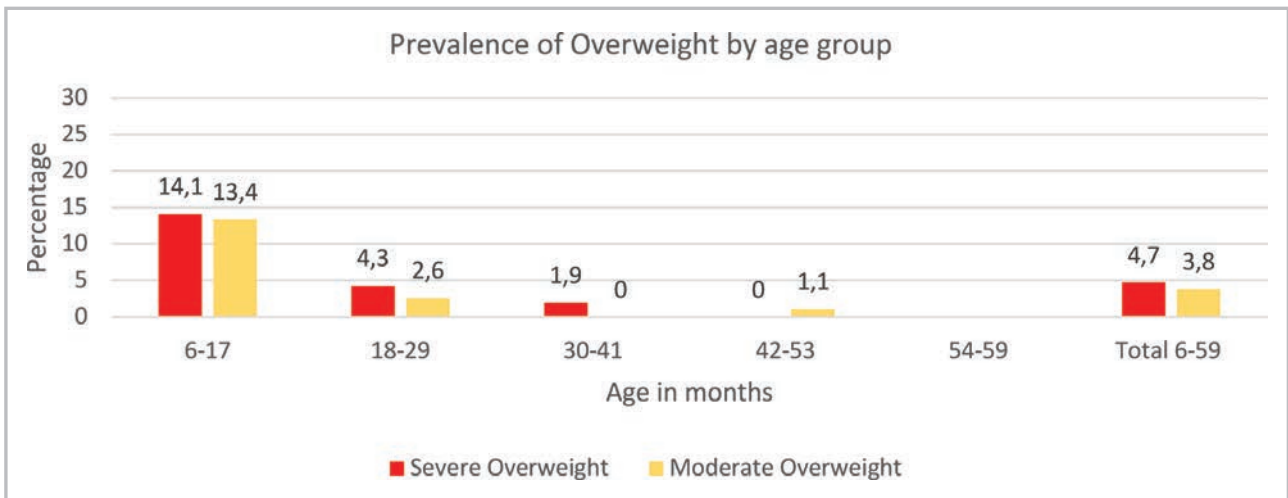


Figure 66: The prevalence of Overweight in children under 5 years by age group

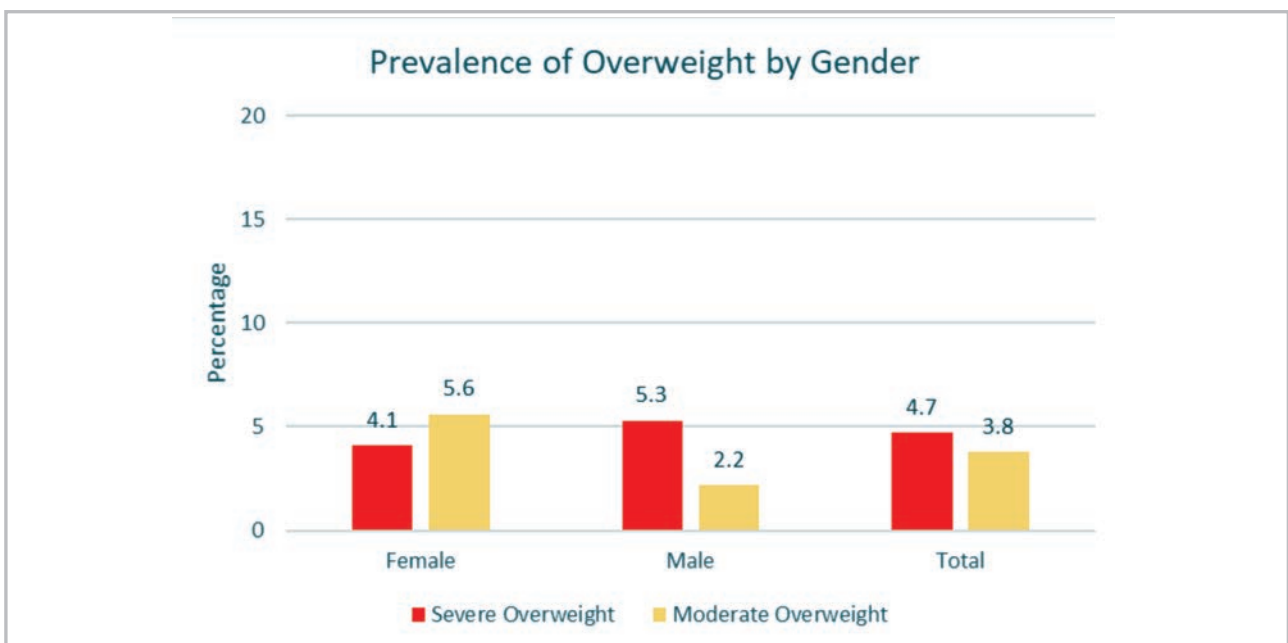


Figure 67: The prevalence of Overweight in children under five years by gender

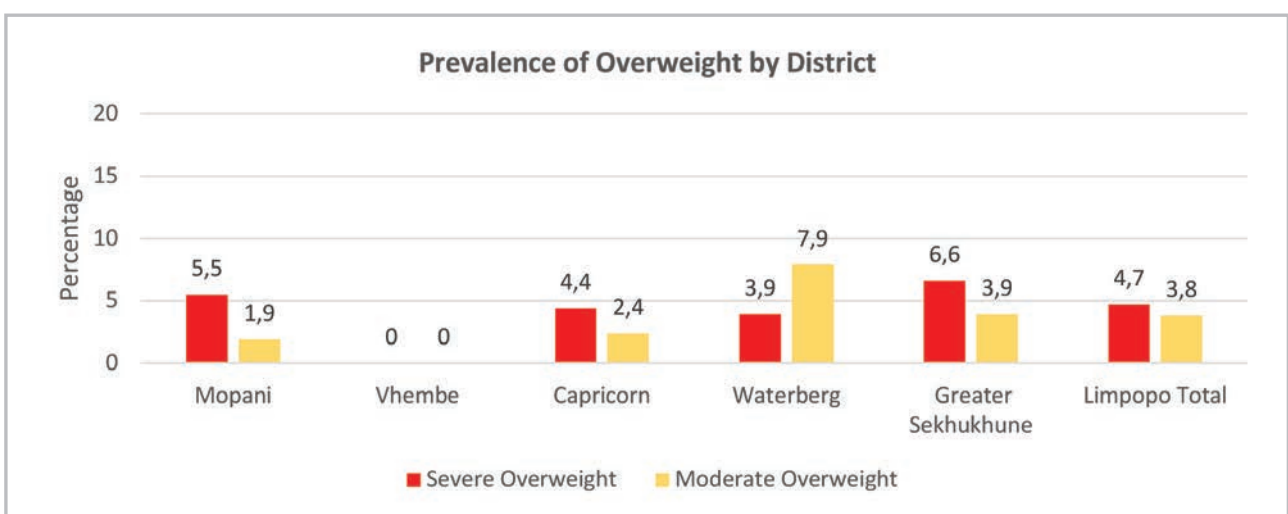


Figure 68: The prevalence of Overweight in children under five years by district

8.2 Adult Anthropometry

8.2.1 Adult BMI

The mean BMI for adults aged 18 years and older (n=1487) in Limpopo was 27.5 kg/m². This was significantly different between males (24.6 kg/m²; 95%CI 23.6-25.5) and females (28.6 kg/m²; 95% CI 27.7-29.4). There were also significant differences in BMI between individuals of different age groups, with those aged 35-64 years having a significantly higher mean BMI (range 28.6-29.0 kg/m²) than those aged 18-34 years (range 24.4-26.7 kg/m²) and those aged 65 years and older (27.4 kg/m²).

Overall, more than 50% of adults aged 18 years and older in Limpopo were classified as either overweight (19.8%) or obese (34.8%). Slightly more than a third (36.0%), 9.4% were classified as underweight (Figure 68).

When disaggregating by gender, (Males n=443. Females n=1040). the prevalence of both overweight (13.6% vs 22.0%) and obesity (40.0% vs 20.6%) is nearly double in females compared to males, respectively (Figure 69). Conversely, the prevalence of underweight in females (7.3%) is about half of that in males (15.4%); however, these results are not significantly different.

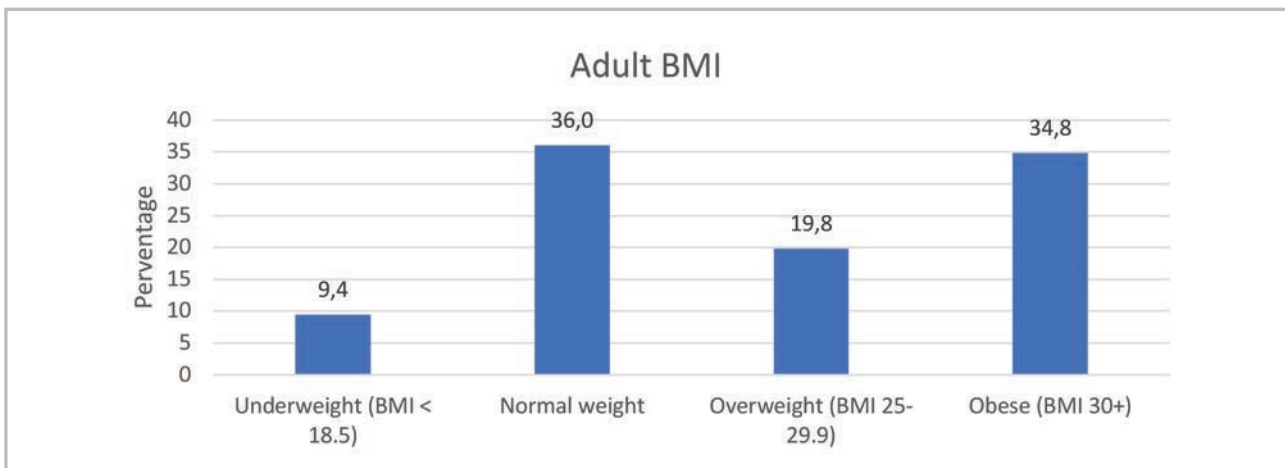


Figure 69: Distribution of BMI in adults aged 18 years and older across all districts in Limpopo

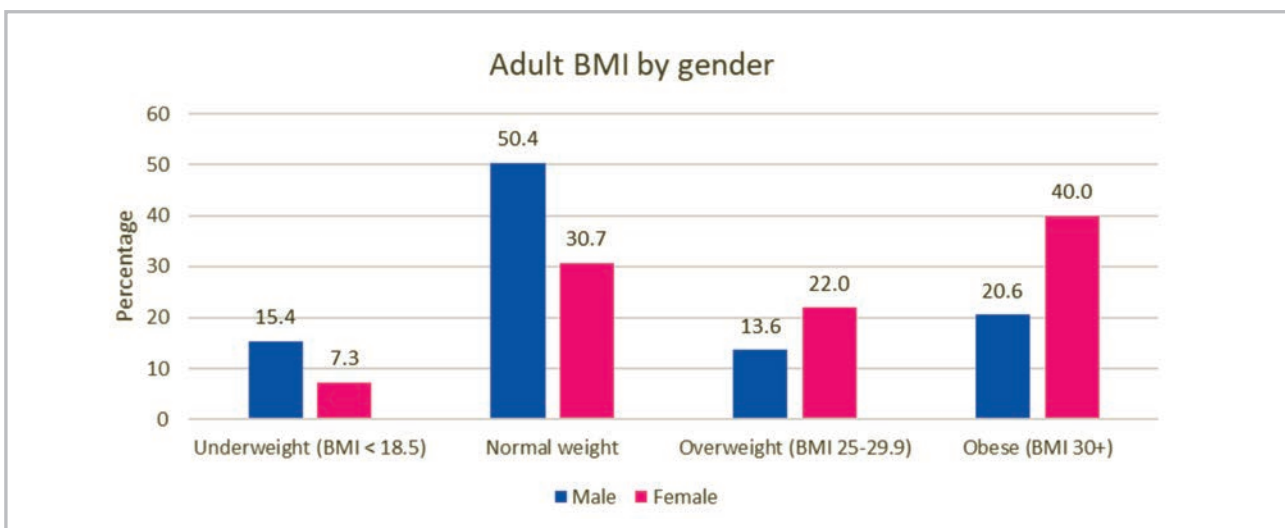


Figure 70: Distribution of BMI in adults aged 18 years and older by gender

When disaggregating the overall adult population by age, those aged 45-64 years have the highest prevalence of overweight, while those aged 35-44 years have the highest prevalence of obesity (Figure 70). The prevalence of underweight ranged from 6.2%-12.0% across all age groups, with no significant differences between them. Figure 66 compares BMI differences by age group between males and females. These figures clearly illustrate that underweight is lower in females (4.1%-8.3%) than males (14.1%-22.9%) across all age categories, except those aged 65 years and older (7.3% vs 3.1%, respectively). Conversely, both overweight (17.5%-29.7% vs 7.8%-24.5%) and obesity (24.2%-49.8% vs 14.6%-35.7%) is higher in females than males across all age categories, respectively.

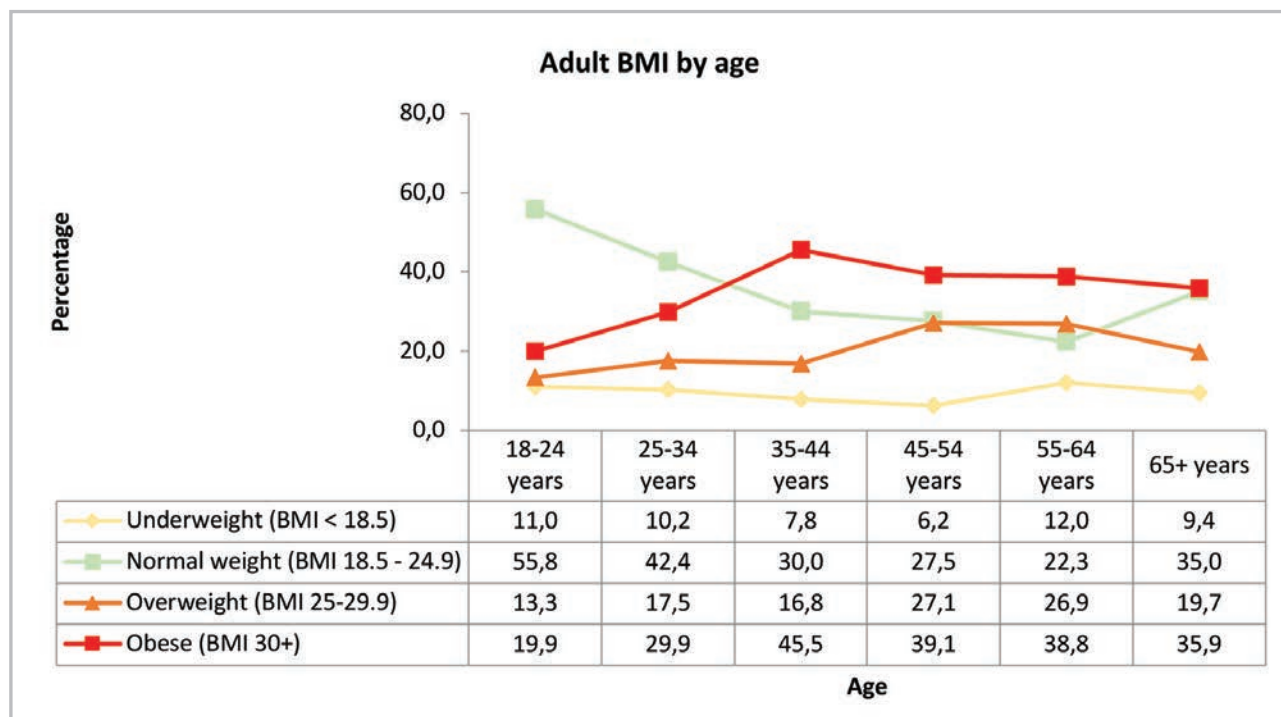


Figure 71: Adult BMI by age

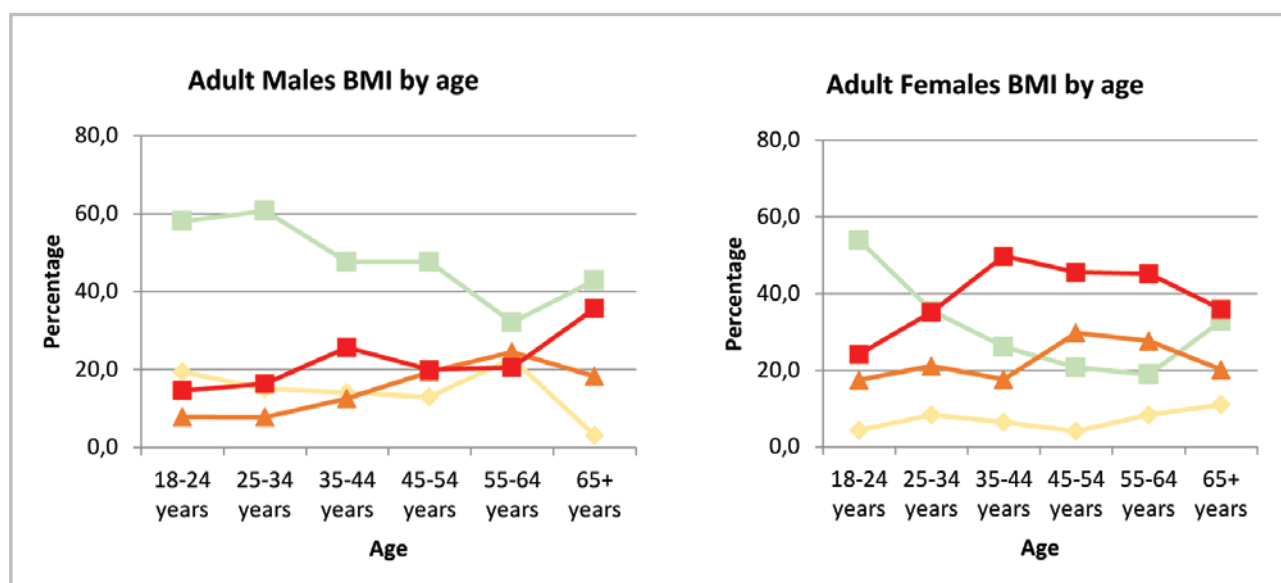


Figure 72: Comparison of the distribution of BMI in adults aged 18 years and older by age and gender

Figure 73 shows the disaggregation of BMI by district and indicates that BMI categories are similar across all districts with no significant differences between them. Figure 74 compares district level data by gender. In both genders, these figures illustrate that in all districts, females have higher rates of overweight and obesity than males have. There are, however, no significant differences in overweight and obesity between districts for both males and females. While it is not significant, it is interesting to note that in the Capricorn District, the disparity in BMI between genders is the highest, where males have a combined overweight and obesity prevalence of 24.4%, compared to females at 66.7%. Furthermore, amongst males, Capricorn has the lowest prevalence of overweight (7.3%) and obesity (17.1%), while females in the same district have the highest combined prevalence of overweight and obesity.

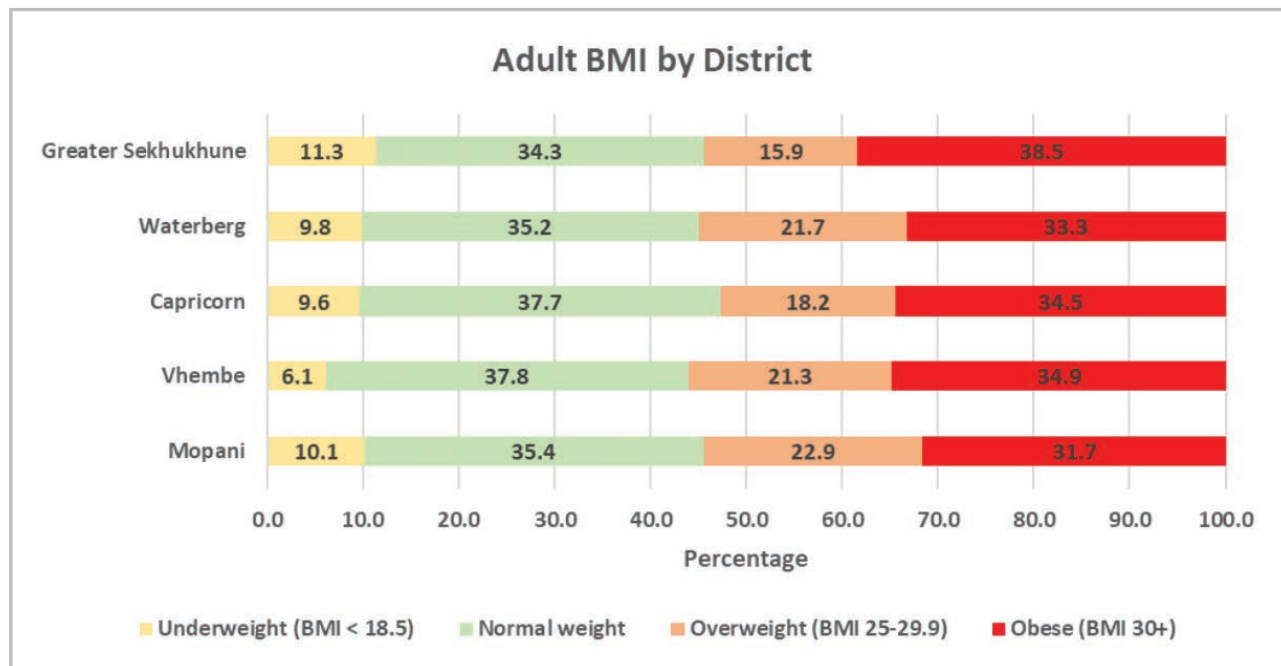


Figure 73: Comparison of the distribution of BMI in adults aged 18 years and older by district

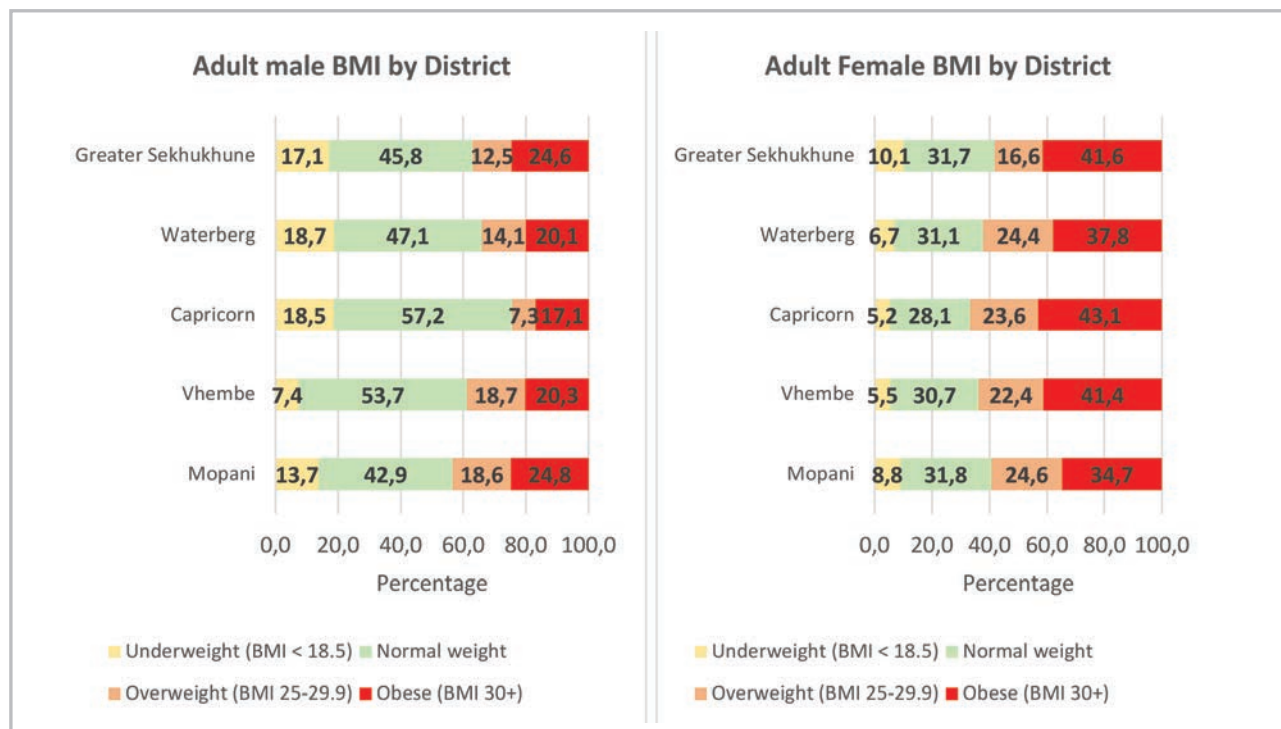


Figure 74: Comparison of the distribution of BMI in adults aged 18 years and older by districts and gender

8.2.2 Waist Hip Ratio

A waist hip ratio (WHR) ≥ 1 in males and ≥ 0.85 in females is indicative of an increased risk of non-communicable diseases (NCDs) such as diabetes and hypertension, amongst other illnesses. The mean waist hip ratio both for males (n=498) and females (n=1296) was 0.88 with a range of 0.81-0.94 and 0.84-0.91, respectively. However, Table 55 clearly shows that overall, a far greater proportion of females (62.3%) had a high WHR compared to only 9.7% of males.

Table 55: Waist hip ratio (WHR) of adults aged 18 years and older by gender, age and district

	Males					Females				
	Waist-hip ratio		Waist hip ratio ≥ 1		n	Waist-hip ratio		Waist hip ratio ≥ 0.85		n
	Mean	95% CI	%	95% CI		Mean	95% CI	%	95% CI	
Age group										
18-24	0.81	[0.79-0.84]	0.0		89	0.84	[0.81-0.87]	37.6	[23.5-54.3]	136
25-34	0.87	[0.84-0.90]	6.4	[2.0-18.7]	113	0.89	[0.87-0.91]	59.3	[52.1-66.1]	284
35-44	0.92	[0.88-0.95]	16.9	[7.9-32.7]	73	0.87	[0.86-0.89]	63.6	[55.8-70.7]	244
45-54	0.92	[0.90-0.93]	10.5	[4.0-24.6]	80	0.90	[0.88-0.92]	68.8	[61.0-75.6]	211
55-64	0.93	[0.91-0.95]	16.4	[7.9-31.1]	62	0.91	[0.89-0.93]	75.9	[65.5-83.9]	201
≥ 65	0.94	[0.91-0.96]	22.2	[12.6-36.1]	81	0.87	[0.85-0.89]	63.6	[52.0-73.7]	220
District - LP										
Mopani	0.90	[0.87-0.93]	11.4	[7.5-16.9]	98	0.89	[0.88-0.91]	72.8	[62.3-81.2]	247
Vhembe	0.89	[0.86-0.91]	11.7	[4.4-27.6]	88	0.88	[0.86-0.89]	59.0	[50.2-67.3]	205
Capricorn	0.88	[0.81-0.95]	9.9	[2.9-28.6]	99	0.90	[0.89-0.92]	67.1	[61.2-72.4]	230
Waterberg	0.90	[0.88-0.92]	11.5	[6.2-20.5]	101	0.88	[0.87-0.89]	61.3	[54.9-67.3]	245
Greater Sekhukhune	0.86	[0.82-0.90]	5.0	[2.1-11.8]	112	0.86	[0.85-0.87]	56.1	[48.8-63.2]	369
Total	0.88	[0.86-0.90]	9.7	[6.3-14.7]	498	0.88	[0.87-0.89]	62.3	[58.6-65.8]	1296

* cell sample sizes too small to generate reasonable estimate

n<30

Table 55 and Figure 74 illustrate that WHR tends to increase with age in females, peaking in the 55-64 year-old age group and decreasing again in the age group 65 years and older. However, in males, those aged 65 years and older were recorded to have the highest prevalence of high WHR. However, this was not significantly different from other age groups. In both males and females, those aged 18-24 had the lowest prevalence of an increased WHR, which was significant when compared to most age groups.

There were no significant differences in the mean WHR among males across the various districts in Limpopo. However, among females, those in Sekhukhune had a significantly lower mean WHR than those in Capricorn and Mopani (Table 55).

Males in Greater Sekhukhune had the lowest prevalence of an increased WHR (5.0%) compared to all other districts who had an average of double the prevalence (Figure 75), with those in Vhembe having the highest prevalence (11.7%). These differences were, however, not significant across districts. While more than 50% of females across all districts had an increased WHR, those in Sekhukhune had the lowest prevalence (56.1%) compared to females in Mopani (72.8%) who had the highest prevalence. However, this too, was not significant.

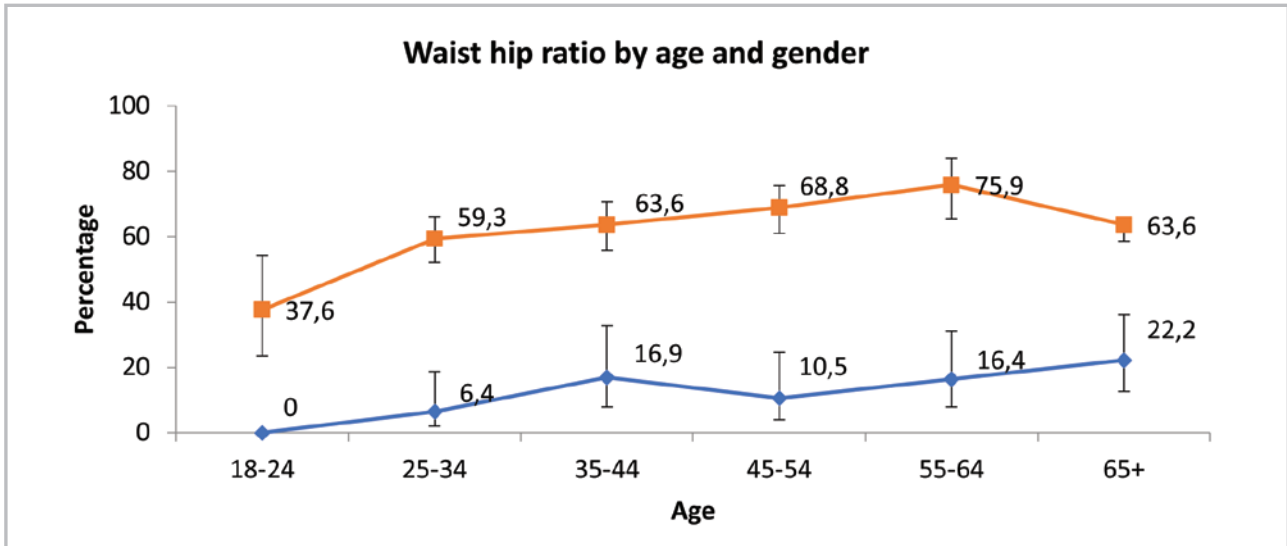


Figure 75: Comparison of the distribution of WHR in adults aged 18 years and older by age and gender

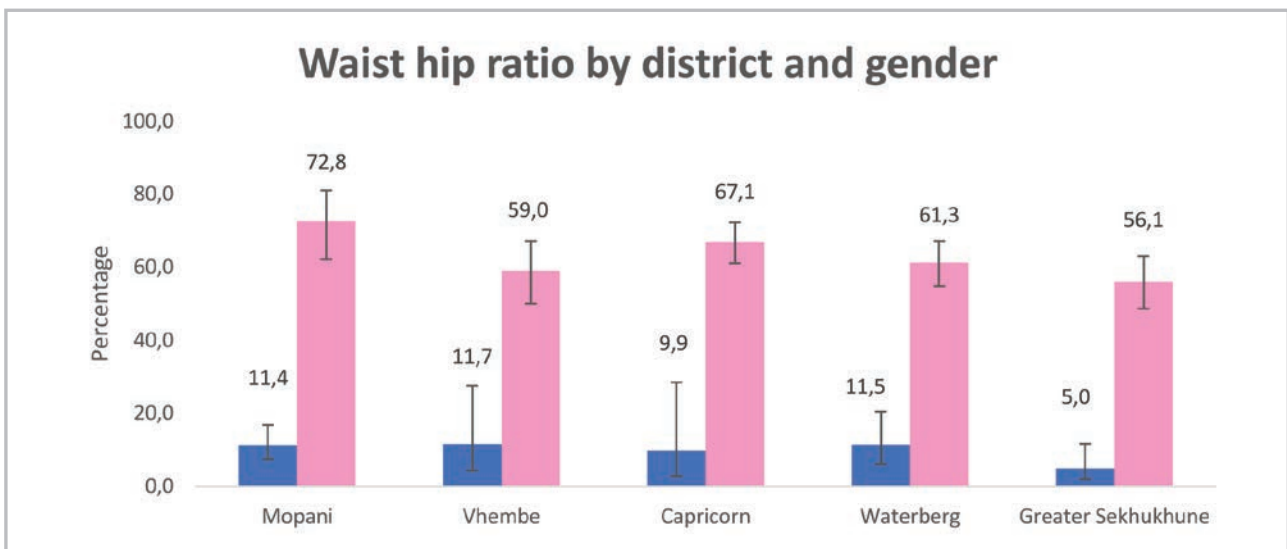


Figure 76: Comparison of the distribution of WHR in adults aged 18 years and older by districts and gender

8.3 Individual Dietary Diversity

A variety of foods in the diet is needed to ensure an adequate intake of essential nutrients. Dietary diversity can be used as a proxy measure of the nutritional quality of a population's diet, as well as an indicator of the access dimension of household food security (Kennedy, 2009). Populations consuming a diet of low dietary diversity are nutritionally vulnerable (Kennedy, 2009).

In this survey, adult participants and caregivers of children aged 6 months to 5 years were asked to recall all foods and drinks they or their child had consumed the previous day. These food items were then allocated to specific food groups. A dietary diversity score (DDS) was calculated by summing the number of food groups from which food had been consumed; the nine food groups were: cereals, roots and tubers; vitamin A-rich vegetables and fruit; vegetables other than vitamin A-rich; fruit other than vitamin A-rich fruit; meat, poultry, and fish; eggs; legumes; dairy products; and foods made with fats or oils. Each food group was counted only once. A DDS below four is considered to be low and to be associated with dietary inadequacies (Steyn, Nel, Nantel et al., 2006).

The mean dietary diversity score (DDS) for individuals residing in Limpopo (n=426) was 4.21, which is indicative of an adequate dietary diversity (Table 56). District comparisons showed that Vhembe had the highest mean DDS (5.8) compared to Mopani, which had the lowest (3.48). The table further shows that while individuals in Vhembe, Capricorn and Greater Sekhukhune reported an adequate DDS (>4), Mopani and Waterberg reported low DDS (3.48 and 3.91, respectively).

We were unable to differentiate between DDS scores for adults and children.

Table 56: Mean dietary diversity scores for individuals in Limpopo

District - LP	Dietary Diversity Score (DDS)		
	Mean	95% CI	n
Mopani	3.48	[3.17-3.80]	96
Vhembe	5.8	[5.14-6.47]	44
Capricorn	4.32	[3.76-4.88]	118
Waterberg	3.91	[3.16-4.67]	58
Greater Sekhukhune	4.08	[3.68-4.47]	110
Total	4.21	[3.89-4.52]	426

Figure 76 illustrates the proportion of the population in Limpopo and in the various districts who have low and acceptable DDS. Overall, 57.2% of people in Limpopo reported an adequate DDS. About 42.8% of individuals had a low DDS. Vhembe reported the lowest proportion of people with low DDS (7.4%), while Mopani reported the highest proportion of people with a low DDS (63.4%).

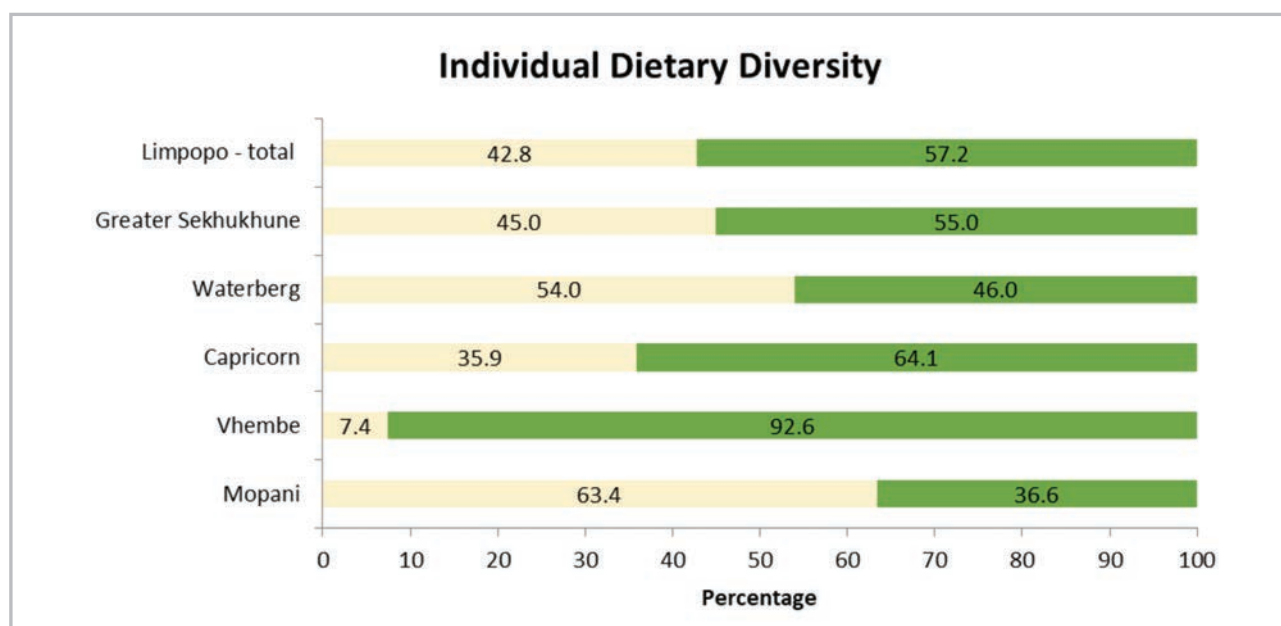


Figure 77: Comparison of the distribution of DDS in individuals in Limpopo by districts

8.4 Relationship of Household Food Insecurity and Malnutrition (Limpopo)

Table 57 presents the associations between nutrition indicators and food security status, based on the Household Food Insecurity Access Scale (HFIAS). In Limpopo Province, there were no significant relationships between food security and any of the four nutrition indicators (stunting, wasting, underweight, and overweight) for children aged 0-5 years. Even though it was not statistically significant, the table does show that the prevalence of household food insecurity was higher among households that had at least one child under 5 years who was stunted (67.9%) than among households that did not have a child under 5 years who was stunted (53.6%).

Furthermore, there was no significant relationship between household food security and having at least one underweight adult in the household. There was also no significant association between household food security and having at least one overweight/obese adult in the household. The only significant relationships were found between food security and waist hip ratio as well as individual dietary diversity. High waist hip-ratio (WHR) is a risk factor for non-communicable diseases (NCDs). Persons with an elevated waist-hip ratio, that is, WHR of >1 in males or >0.85 in females, are considered as being at increased risk of NCDs. The prevalence of household food insecurity was significantly higher (55.2%) in households that had at least one person who had an elevated waist-hip ratio, compared to households that did not have anyone with an increased WHR (47.6%). Similarly, the prevalence of food insecurity was significantly higher (67.2%) in households that had at least one person who had a low dietary diversity (DDS <4) compared to households in which everyone had acceptable dietary diversity (45.7%).

Table 57: Relationship between Household Food Insecurity and Nutrition indicators in the Limpopo Province

Nutrition indicators (%)	Categories	Food security status (%)		Chi-square tests
		Food secure	Food insecure	
0-5 years				
Stunting	Yes	32.1	67.9	
	No	46.4	53.6	
Wasting	Yes	49.1	50.9	
	No	44.0	56.0	
Underweight	Yes	43.2	56.8	
	No	44.5	55.5	
Overweight	Yes	44.4	55.6	
	No	44.4	55.6	
Underweight	Yes	44.0	56.0	
	No	49.0	51.0	
Obesity / Overweight	Yes	49.4	50.6	
	No	47.3	52.7	
Increase risk of NCDs (Waist / hip ratio)	Yes	44.8	55.2	**
	No	52.4	47.6	
Individual Dietary Diversity	Low	32.8	67.2	***
	Acceptable	54.3	45.7	

* p<0.10, ** p<0.05, ***p < 0.01

Table 60 demonstrates South Africa's double burden of malnutrition. While on the one hand, South Africa experiences higher levels of undernutrition, it also experiences higher levels of overweight and obesity (FAO et al., 2021).

Infant feeding practices

Exclusive breastfeeding has been adopted as one of the key and crucially important components of the *Infant and Young Child Feeding Policy* which was developed in 2007 (DoH, 2011). Promotion, protection, and support of breastfeeding are a key focus area of infant and young child feeding of the Integrated Nutrition Programme of the Department of Health.

The results of the current study indicate that 87.5% of children under 2 years were breastfed at some point in their lives, which is very similar to the national results reported in the SADHS in 2016 (84%).

Furthermore, the results of the current study indicated that more than three quarters of children aged 0-2 years in Limpopo were introduced to breastfeeding immediately after birth, with a total of 85.5% being breastfed within an hour of birth. These results are very similar to the national results reported by the SANHANES in 2012 (83.0%) and far higher than those reported in the SADHS in 2016 (67%).

Exclusive breastfeeding in Limpopo was reported to be 11.6%. This should be interpreted with caution due to the small sample size. However, 11.6% is higher than the national reports in the 2003 SADHS (8.3%) and SANHANES 2012 (7.5%), but considerably lower than that reported by Shisana et al. in 2008 (25.7%) and the 2016 SADHS (30%).

In 1998, 2003, and 2016, the SADHS reported an average duration of breastfeeding of 15.6 months, 16.6 months, and 12.2 months, respectively. SANHANES, however, showed a much lower average duration of breastfeeding (5.9 months). The average duration of breastfeeding in those who are not currently being breastfed in Limpopo was 6.97 months, which is slightly longer but more in line with what the SANHANES reported compared to the SADHS.

Overall, the first drink other than breastmilk was mainly introduced at 0-1 months. This occurred in about 42.7% of children. We can assume that this is most likely the introduction of infant formula, for mothers who may be unable to breastfeed. At 6 months, other drinks were introduced in 19.2% of children, with less than 10% of children being introduced to other drinks between 2-5 months of age. With regards to the type of drink that was first introduced, just more than 40% indicated infant formula, while 34% indicated plain water.

After 6 months, infants should be introduced to solid foods as breastmilk is no longer sufficient to meet the nutritional requirements. However, the results of this study indicate that complementary feeding is initiated earlier than the anticipated 6 months at 4.4 months. This is similar to the results of the SANHANES 2012 (4.5 months). The most common food introduced is commercial-based cereal rather than homemade cereal.

Anthropometry (0-5 years)

In 2012, the SANHANES reported a national stunting prevalence of 28.6% in children 0-5 years, and a provincial prevalence of 24.5% in Limpopo. Four years later, in 2016, the SADHS reported a slightly lower stunting prevalence at both the national (27.0%) and provincial (22%) levels. The results of the current study appear to indicate that the stunting prevalence in Limpopo has continued to decline, with a current prevalence of 18.3% in children of the same age group, which indicates that fewer children were experiencing chronic undernutrition in 2021. While the SADHS reported that stunting was more prevalent nationally in the age group 18-23 months, the results of this provincial analysis indicate that stunting is more prevalent in children aged 6-17 months in Limpopo. Furthermore, the SANHANES and SADHS has reported that stunting is more prevalent in male children than female children at a national level. This study shows similar trends at a provincial level. At a district level, the current study reported that stunting is more prevalent in the Waterberg and Greater Sekhukhune districts than it is in the Capricorn District.

The national prevalence of wasting was reported to be 3.7% in 2012 (SANHANES), with a higher provincial prevalence in Limpopo of 5.8%. In 2016, similar national results were presented in the SADHS (3.0%); however,

a provincial prevalence was not reported at the time. The current study has reported a higher provincial prevalence of wasting in Limpopo of 7.7%, thereby indicating that slightly more children were experiencing acute undernutrition in 2021, with the youngest age group experiencing the highest prevalence. There was, however, no differences between genders and across districts in the current study.

The prevalence of 'underweight' in Limpopo in the current study (11.5%) is more than double the provincial prevalence of underweight reported by the SANHANES in 2012 (5.8%). A similar prevalence was reported at the national level in 2012 (6.8%) and 2016 (6%).

In 2016, the SADHS reported a national prevalence of 'overweight' of 13% in children 0-5 years. SANHANES reported a higher prevalence in females than in males across all age categories at a provincial level. The current study corroborates these findings, though the differences between genders and across districts were not significant. Children in Limpopo do, however, have a lower prevalence of overweight (8.6%) than the national level reported in 2016.

The above trends across time seem to indicate that over the last 10 years, chronic undernutrition has reduced, but acute undernutrition has increased. This could be a direct impact of the COVID-19 pandemic. At a district level, it appears as if the Waterberg and greater Sekhukhune districts have the highest prevalence of both chronic undernutrition. Mopani appears to have the highest prevalence of acute undernutrition, followed closely by Waterberg.

Anthropometry (18 years and older)

At a national level, the mean BMI in females and males were reported to be 28.9 kg/m² in 2012 and 29.2 kg/m² in 2016. For males, there was no change in mean BMI between 2012 and 2016, as both the SANHANES and the SADHS reported a mean BMI of 23.6 kg/m². A slightly lower provincial mean was reported for BMI in Limpopo for both females (27.7 kg/m²) and males (23.0 kg/m²). The current study, however, reported a slightly higher mean BMI for both females (28.6 kg/m²) and males (24.6 kg/m²) in Limpopo.

Based on BMI cut off points, SANHANES reported a national prevalence of overweight and obesity of 64.0% in females and 30.7% in males 10 years ago. The SADHS reported similar results in 2016 (68.0% in females and 31% in males). The provincial prevalence of overweight and obesity in Limpopo was slightly lower than the national estimate for both females (56.6%) and males (27.8%) in 2012. In 2016, the SADHS reported an increase in the provincial prevalence in Limpopo in females (64.0%) and a slightly lower prevalence of 25% in males. Ten years later, the results of this study indicate a slightly lower prevalence of overweight and obesity in females (62.0%) compared to the SADHS, and a higher prevalence in males (34.2%).

The current study also reported an increase in the proportion of both females (62.3%) and males (9.7%) with regards to a waist hip ratio larger than 0.85 and 1, respectively, compared to previous studies. For females, SANHANES reported 47.1% and 44.7% at a national and provincial level, respectively. For males, SANHANES reported 6.8% and 5.2% at a national and provincial level, respectively.

Dietary Diversity

A diet that is sufficiently diverse reflects nutrient adequacy. This statement is based on the fact that no single food contains all required nutrients for optimal health. Consequently, the more food groups included in a daily diet, the greater the likelihood of meeting nutrient requirements (Kennedy, 2009). Monotonous diets, based mainly on starches such as maize, rice, and bread, have been closely associated with food insecurity. Dietary diversity is an outcome measure of food security at the individual or household level (Kennedy, 2009). Apart from reflecting on food security, a low DDS has also been associated with low weight and stunted growth (Rah, Akhter, Semba et al., 2010), as well as other health issues. In the present survey, the mean dietary score of the population was 4.2, with nearly 43% of the population having a score less than 4.

These results are similar to those reported in SANHANES nationally in 20012 (mean of 4.2 and 40%), and slightly higher than that of the NFCS in 2009 (mean 4.02 and 38%).

9.1 Household health status, chronic illnesses, and diseases

The study sought to review the disease burden and health experiences of household heads and household members in the year preceding the study. As expected, a wide range of diseases were reported (Table 58). Most household heads reported having experienced coughs/colds/chest infections (17.9%), followed by other diseases (13.9%) - hypertension (11.0%), headaches (7.5%), and diabetes (7.2%). Coughs/colds/chest infections were also reported by 12.3% of household members. These are commonly reported ailments some of which are simply symptoms rather than confirmed diseases. Nonetheless, the level of access to nutritious food predisposes individuals to a multitude of illnesses/ conditions/ diseases and also influences their ability to prevent/ manage/ recover from these illnesses/ conditions/ diseases. Diseases such as diabetes and hypertension, for example, require specific diets if they are to be managed successfully. It is, therefore, important that households have access to diverse diets, including medically prescribed diets.

Table 58: Illnesses and diseases reported by household heads and members in Limpopo a year prior to the survey

Disease	Household heads (%)	Household members (%)
Cough/cold/chest infection	17.9	12.3
Other disease	13.9	6.3
Hypertension	11.0	4.2
Headache	7.5	3.9
Diabetes	7.2	2.3
Toothache or mouth infection	5.6	2.5
Eye infection	5.0	2.9
Abdominal pains	4.6	2.7
HIV/AIDS	3.2	1.4
Asthma	1.7	0.9
Fever/malaria	1.5	0.9
Paralysis	1.4	1.1
Skin rash	1.3	1.1
Vomiting	1.2	0.9
TB	1.1	0.4
Diarrhoea	0.9	1.2
Bronchitis/pneumonia/chest pain	0.1	0.2

The study found a low prevalence of chronic illness (a disease that lasts for more than 3 months) at both the household head (13.6%) and household member levels (5.8%) (Figure 79). The significance of this finding is that food and nutrition security is vital to managing most chronic diseases as the nutritious status of foods that people eat assists in controlling recovery processes. The prevalence of chronic diseases adds to the need for ensuring that most households are food secure.

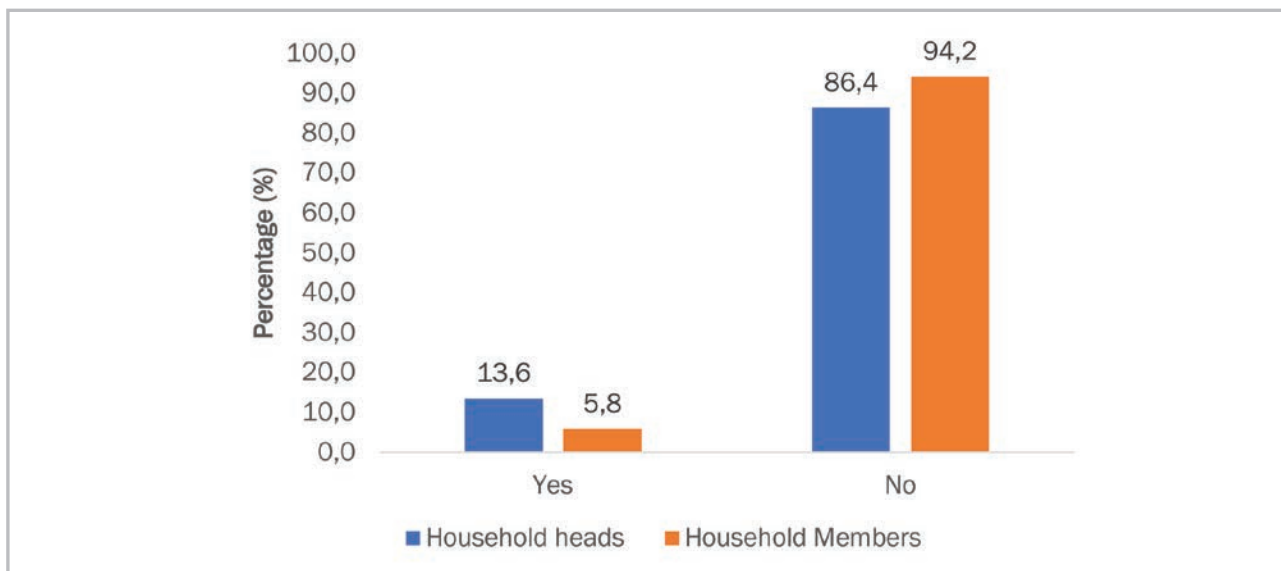


Figure 78: Household heads and members who reported having been continuously ill, for at least 3 months in the last 12 months prior to the survey

There was generally no difference in the reported or perceived health status of household heads by sex and age group, but noticeable differences are observed, particularly across districts (Table 59). Capricorn had the highest percentage (21.4%) of household heads who perceived their general health status as poor or fair.

Table 59: Household heads' perceived health status by sex, age, and district

	Poor/Fair		Good		Very good/Excellent		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	14.2	[8.3-23.3]	46.6	[40.3-53.1]	39.2	[35.3-43.2]	722
Female	14.4	[10.2-19.9]	55.7	[48.9-62.3]	29.9	[24.0-36.6]	823
Age group							
18-24	16.9	[4.4-47.0]	45.5	[26.9-65.6]	37.6	[21.6-56.8]	60
25-34	14.0	[8.6-22.2]	53.8	[37.7-69.1]	32.2	[21.3-45.4]	181
35-44	11.6	[6.1-21.0]	53.9	[42.5-64.8]	34.5	[24.6-46.0]	237
45-54	16.0	[9.3-26.2]	51.7	[42.7-60.6]	32.2	[25.5-39.8]	297
55-64	12.2	[7.8-18.8]	48.9	[42.1-55.8]	38.9	[31.0-47.3]	315
65+	14.9	[8.6-24.6]	50.3	[42.1-58.5]	34.7	[23.6-47.8]	439
Total	14.2	[9.8-20.1]	51.2	[46.1-56.3]	34.6	[30.6-38.8]	1,529
District							
Capricorn	21.4	[17.1-26.5]	40.0	[31.4-49.3]	38.6	[31.1-46.6]	278
Sekhukhune	14.8	[4.9-36.9]	49.1	[37.8-60.6]	36.0	[28.9-43.8]	334
Mopani	18.0	[13.2-23.9]	48.0	[43.3-52.8]	34.0	[28.9-39.5]	311
Vhembe	10.9	[7.0-16.7]	65.2	[57.9-71.8]	23.9	[17.6-31.6]	346
Waterberg	7.8	[4.1-14.3]	54.5	[42.8-65.7]	37.7	[27.7-48.8]	276
Total	14.3	[9.9-20.3]	51.2	[46.1-56.3]	34.5	[30.5-38.7]	1,545

A similar pattern is observed across household members by sex, age, and district (Table 60). Unsurprisingly, the elderly (65 years and older) had the highest percentage of household members who were reported as having poor or fair health status, with 16.6%.

Table 60: Household members' reported perceived health status by sex, age, and district

	Poor/Fair		Good		Very good/Excellent		Total
	%	95% CI	%	95% CI	%	95% CI	n
Sex							
Male	9.9	[8.1-11.9]	45.3	[40.5-50.1]	44.9	[40.2-49.7]	1,911
Female	10.0	[8.3-11.9]	48.6	[43.9-53.3]	41.5	[36.7-46.3]	2,455
Total	9.9	[8.5-11.5]	47.1	[42.7-51.6]	43.0	[38.5-47.6]	4,366
Age group							
0-14	5.5	[4.0-7.4]	46.9	[40.7-53.2]	47.6	[41.1-54.2]	898
15-24	7.3	[5.3-9.9]	46.1	[40.5-51.9]	46.6	[40.6-52.7]	727
25-34	8.2	[6.3-10.6]	44.5	[39.1-50.1]	47.2	[41.3-53.3]	682
35-44	10.5	[7.7-14.2]	47.0	[40.9-53.2]	42.5	[36.5-48.6]	514
45-54	14.5	[11.2-18.6]	44.0	[38.0-50.1]	41.5	[35.6-47.8]	420
55-64	14.0	[10.5-18.4]	50.8	[44.5-57.2]	35.2	[29.0-41.9]	378
65+	16.6	[13.2-20.6]	51.9	[46.2-57.6]	31.5	[26.4-37.0]	456
Total	9.9	[8.4-11.5]	47.0	[42.7-51.4]	43.1	[38.6-47.7]	4,075
District							
Capricorn	12.6	[9.2-17.0]	37.6	[31.5-44.1]	49.8	[41.7-58.0]	1,303
Sekhukhune	7.9	[5.9-10.7]	41.5	[29.8-54.2]	50.6	[37.2-63.9]	1,724
Mopani	8.2	[6.1-11.1]	41.6	[36.8-46.6]	50.2	[45.7-54.6]	1,499
Vhembe	7.9	[6.0-10.2]	60.6	[53.2-67.6]	31.5	[24.5-39.5]	1,644
Waterberg	8.2	[5.5-12.0]	43.4	[33.2-54.2]	48.4	[37.8-59.2]	1,401
Total	9.0	[7.8-10.4]	45.8	[41.6-50.0]	45.2	[40.8-49.7]	7,571

Figure 79 shows that Molemole local municipality was under the highest category (14.6% to 18.6%) of household members with reported poor or fair health status. Local municipalities that fell under the lowest category (1.3% to 3.8%) were Ba-Phalaborwa, Makhado, and Thabazimbi.

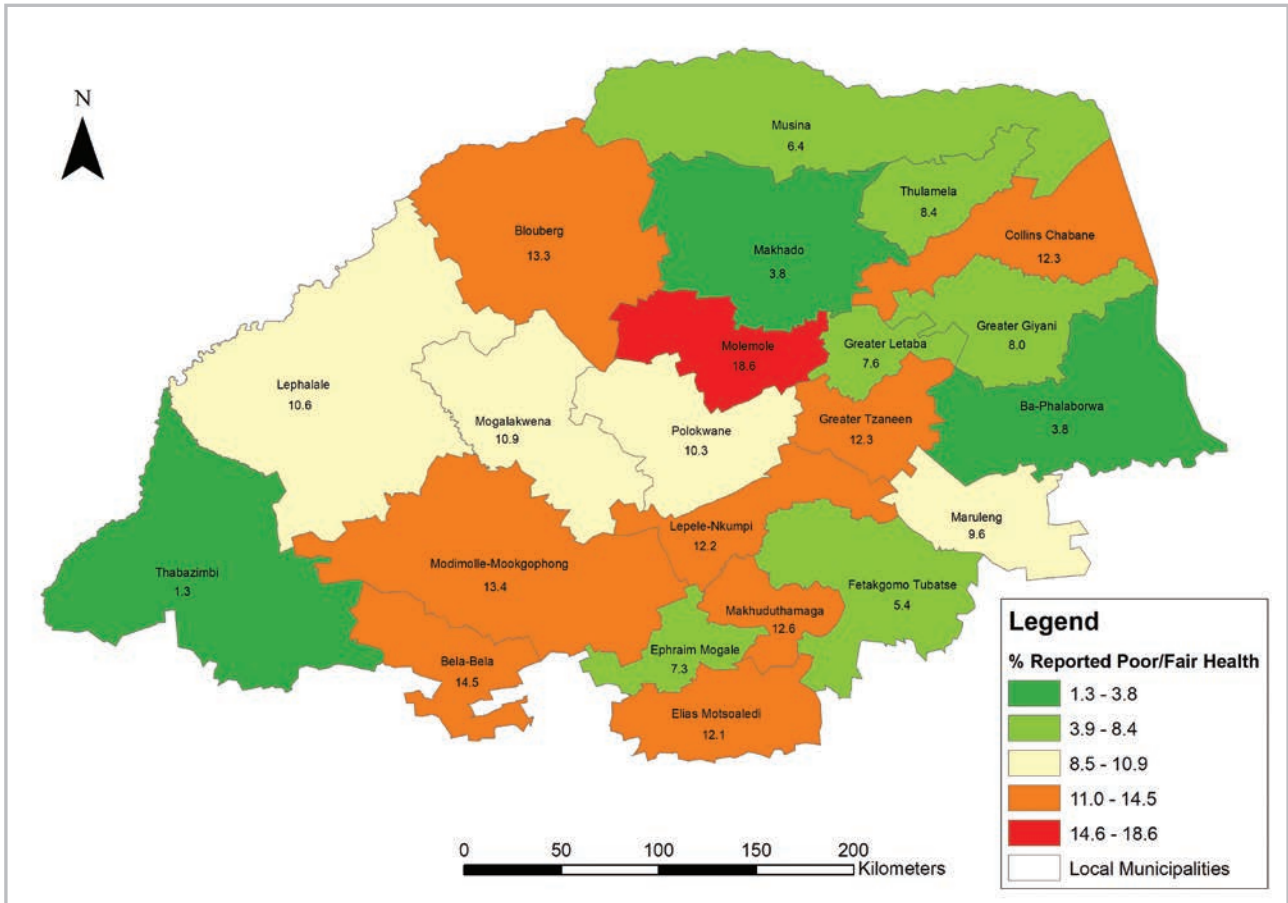


Figure 79: Household members' reported perceived health status by local municipality

This section covers some of the shocks and their associated effects on household food availability. The COVID-19 coping strategies are also covered in this section, bearing in mind that the survey was conducted three weeks after the first COVID-19 lockdown, which affected household food access and availability in the study area.

9.2.1 Drought and water shortage

Shocks due to floods were not commonly reported across the five districts of Limpopo. About 20% of the respondents in Capricorn District reported having experienced floods, with the experience having been reported in Sekhukhune District. Over 70% percent across the five districts reported that they have not experienced floods (Figure 80).

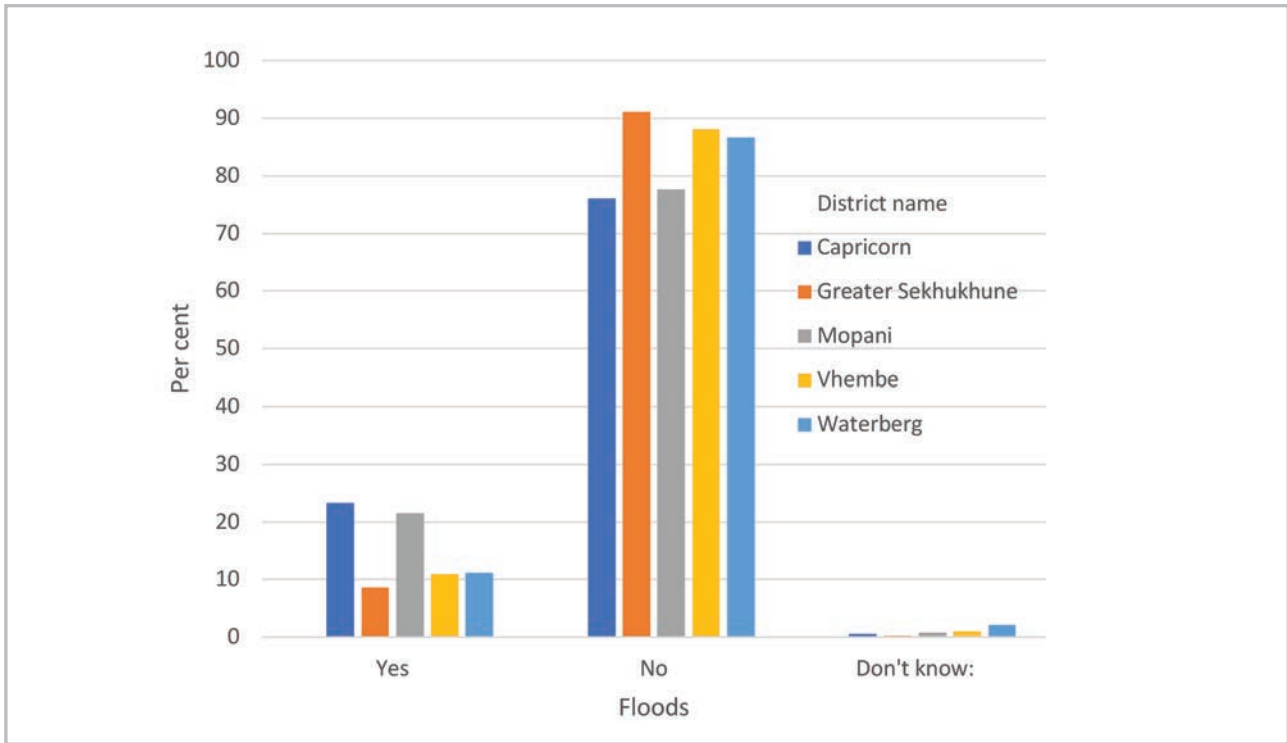


Figure 80: Households that experience drought and water shortage shock

Overall, droughts are rarely experienced in Limpopo Province as shown by Figure 80 above, in which only about 22% of the households in Sekhukhune District reported experiencing droughts.

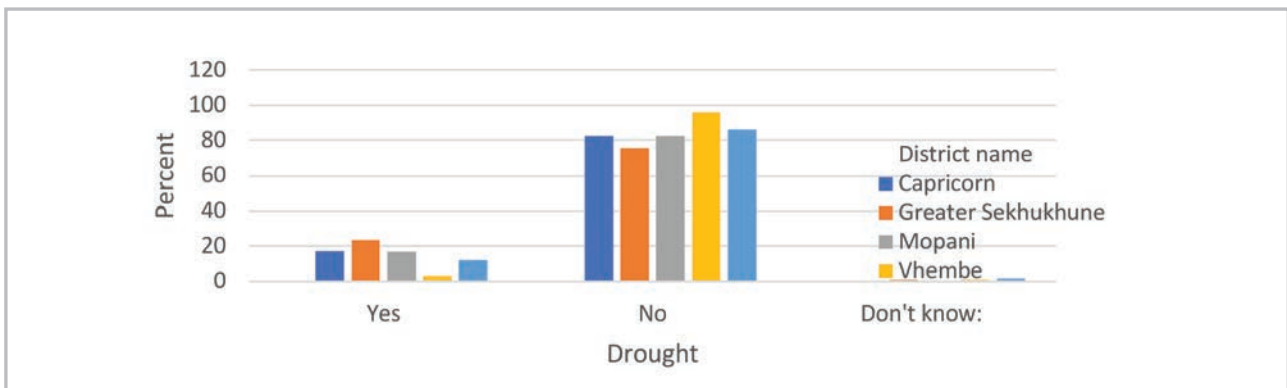


Figure 81: Households that experience drought shock by district

This is also because Sekhukhune is part of the dry regions where annual average rainfall is very low. Vhembe District had more than 90% response of not experiencing droughts. This is in line with the observations and evidence from literature which points to the district being the one that receives the highest average annual rainfall (Figure 82).

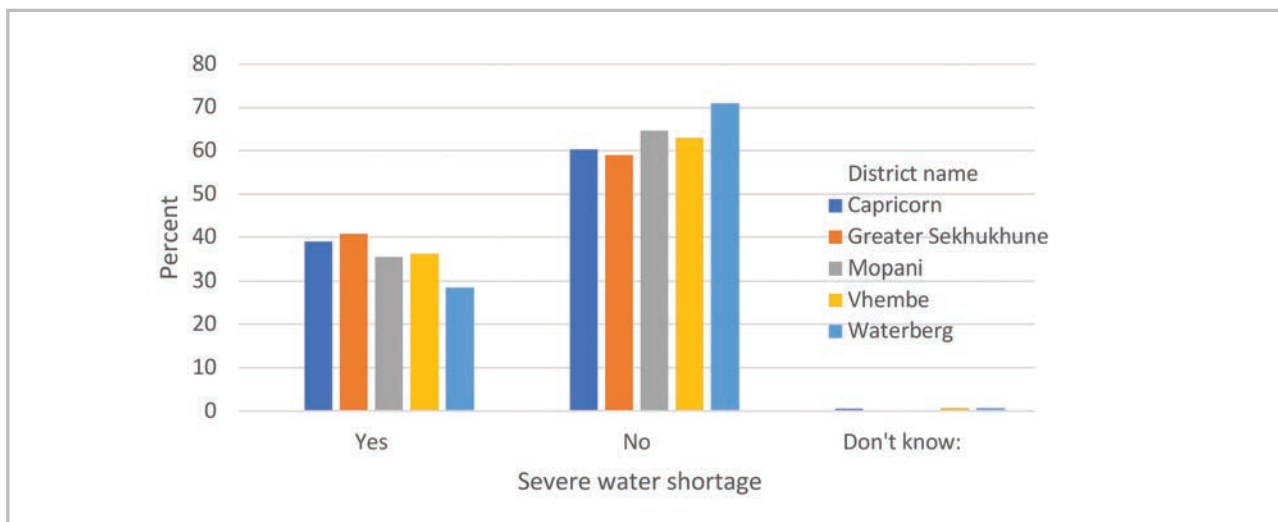


Figure 82: Household that experience severe water shortage shock by district

Severe water shortage is one of the shocks that was widely reported in most of the districts and was more pronounced in Sekhukhune (41%) and Capricorn (39%) districts, as depicted by the graph. However, severe water shortage was least reported in Waterberg (28%) (Figure 83).

9.2.2 Crop disease and crop failure

Crop failure and emergence of crop diseases were not widely reported across the districts, with Mopani having about 22%, whilst the least was reported in Vhembe District (8%) (Figure 83).

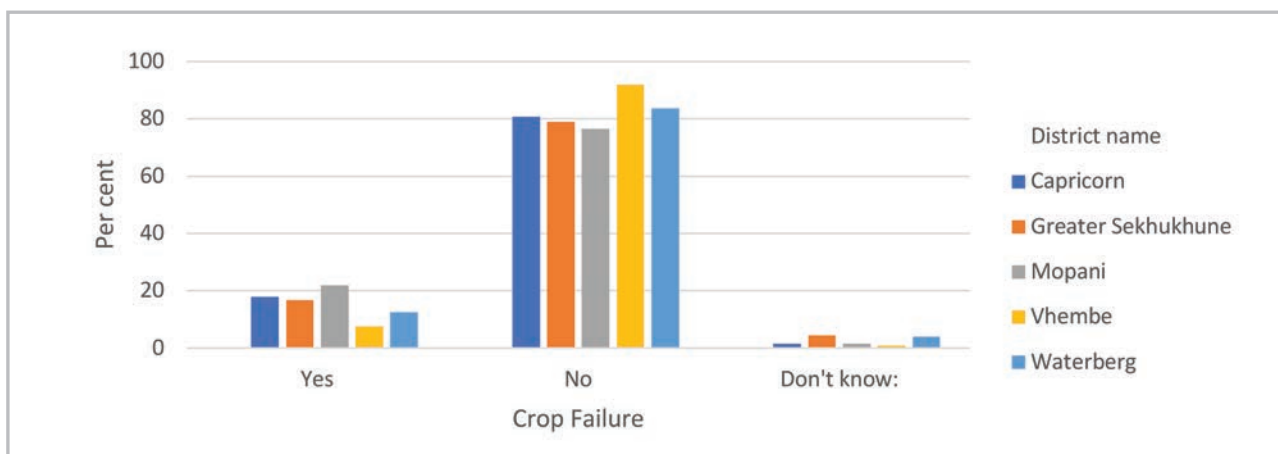


Figure 83: Household that experience crop failure shock by district

Vhembe District is a major cropping area because of high rainfall received, hence there is very limited crop failure that is experienced in the district. Mopani and Capricorn districts had 15% and 18% records of experiencing crop diseases. Livestock theft was least reported across all the five districts, with only about 10% respondents reporting cases of livestock theft in Sekhukhune District. This district is suitable for livestock rearing hence it is likely to have high incidences of stock theft (Figure 84).

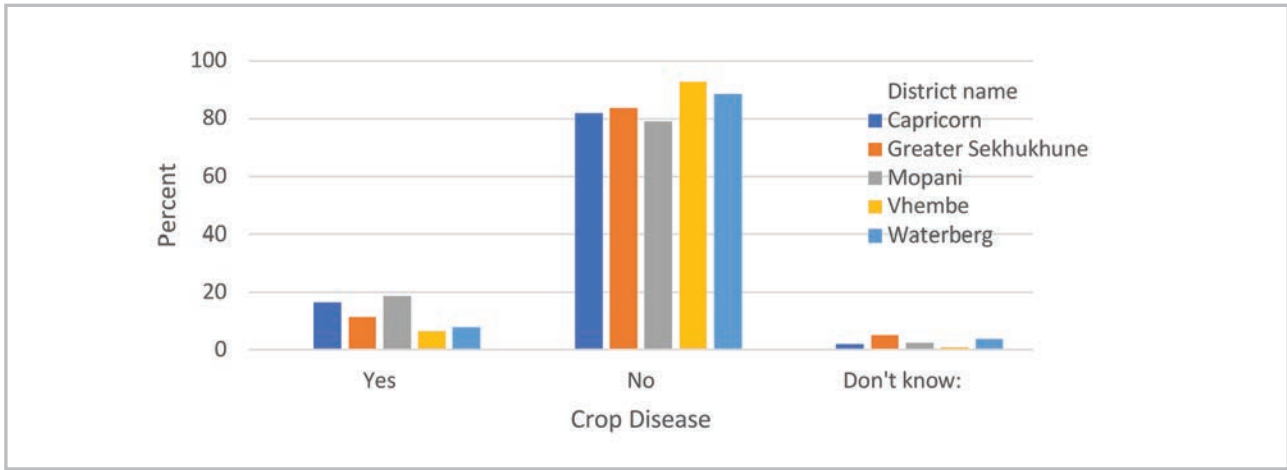


Figure 84: Households that experience drought and water shortage shock by district

9.2.3 Increase in inputs and food prices

The increase in food prices was the biggest shock experienced across all the five districts in the Limpopo Province. Sekhukhune District reported the highest percentage (73%) in terms of increases in food prices. This is mainly attributable to the idea that there is very limited food production in this district, and shocks such as the COVID-19 pandemic would immediately trigger prices increases since the supply chains were disrupted. This is clearly shown by the least reported prices increases in Vhembe District (40%) in which most food crop and fruit production occurs, hence most households involved in crop and fruit production will not experience this shock (Figure 86).

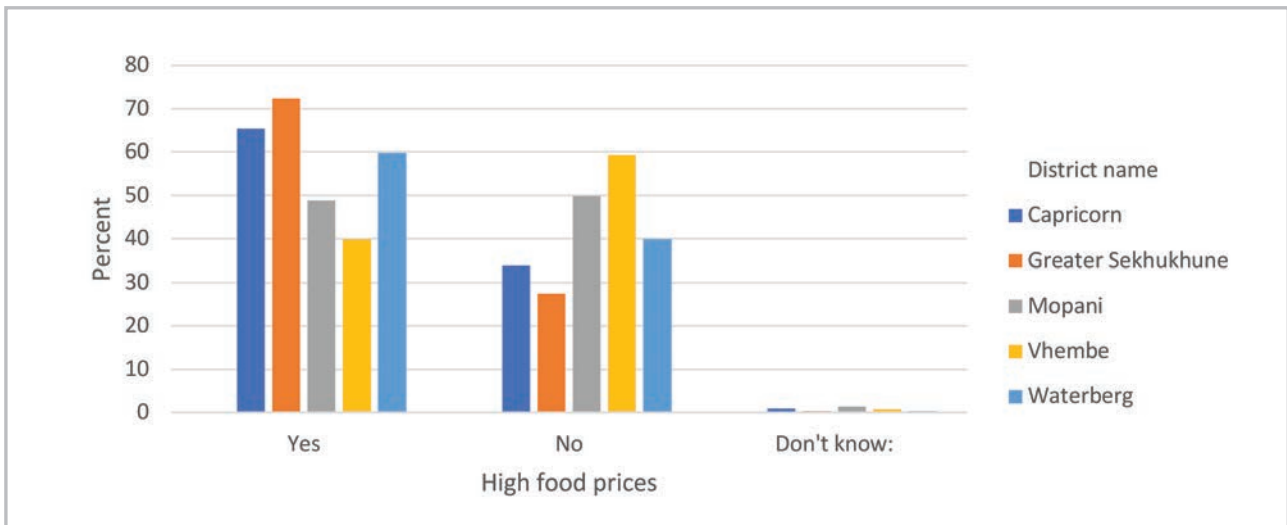


Figure 85: Households that experience high food prices shock by district

The increase in input prices was also reported mainly in Capricorn District (37%) and Mopani District (34%), whilst it was least in Vhembe District (27%). The increase in input prices also has a direct effect on the increase in food process, hence this justifies the reported increases in food prices across the five districts (Figure 87).

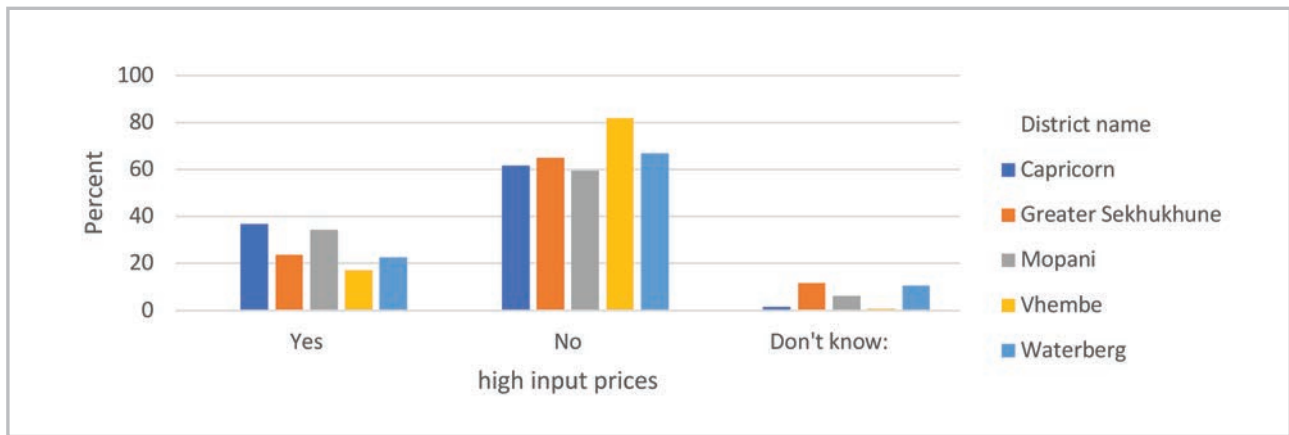


Figure 86: Household that experience high input prices shock by district

The death of a bread winner and crops being eaten by wild animals were rarely reported across the five districts of Limpopo.

9.2.4 COVID-19 shocks and associated coping strategies

The Covid-19 pandemic resulted in serious disruptions of food supply chains and production systems. Results indicate that less than 5% of the respondents in all the districts of Limpopo did not start food production because of the pandemic.

Table 61: Households that are worried their food would run out before they get money to buy more

Variable		Households worried their food would run out before they get money to buy more							
		Never		Rarely		Sometimes		Often	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
District	Capricorn	59	18.0%	42	12.8%	129	39.4%	97	29.7%
	Sekhukhune	57	14.0%	51	12.5%	183	44.9%	117	28.7%
	Mopani	63	16.4%	51	13.3%	142	37.1%	127	33.2%
	Vhembe	97	24.1%	21	5.2%	180	44.7%	105	26.1%
	Waterberg	70	21.7%	26	8.0%	120	37.2%	107	33.1%

About 45% of the households in Sekhukhune were sometimes worried of the idea that they would run out of food before they get money to buy some more food. This followed an almost similar trend in Vhembe District, where about 44% of the households sometimes worried that their food would run out. In Sekhukhune as well, the food that they bought did not last and 46% of the respondents did not have money to buy more food (Tables 61 and 62).

Table 62: Households whose food did not last, and they did not have money to get more

		The food that was bought just did not last, and they did not have money to get more							
		Never		Rarely		Sometimes		Often	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
District	Capricorn	73	22.2%	54	16.4%	126	38.3%	76	23.1%
	Sekhukhune	69	17.0%	54	13.3%	185	45.6%	98	24.1%
	Mopani	89	23.2%	57	14.8%	132	34.4%	106	27.6%
	Vhembe	111	27.5%	34	8.4%	162	40.2%	96	23.8%
	Waterberg	76	23.5%	30	9.3%	121	37.5%	96	29.7%

Table 63: Households who could not afford sufficient and nutritious food because the price of food increased

		We could not afford sufficient and nutritious food because the price of food increased							
		Never		Rarely		Sometimes		Often	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
District	Capricorn	72	22.0%	73	22.3%	105	32.0%	78	23.8%
	Sekhukhune	77	18.9%	68	16.7%	157	38.5%	106	26.0%
	Mopani	82	21.4%	51	13.3%	137	35.7%	114	29.7%
	Vhembe	119	29.5%	35	8.7%	155	38.5%	94	23.3%
	Waterberg	72	22.3%	33	10.2%	118	36.5%	100	31.0%

In Waterberg, about 31% of the households reported that they could not often afford sufficient and nutritious food because of the price increases. A similar trend was reported in Sekhukhune (26%) and Mopani districts (30%). Across all the five districts, the respondents reported that they sometimes could not afford sufficient and nutritious foods owing to the increases in the price of food. As a result, most households were unable to eat healthy and nutritious foods, as shown in Table 63, where 42% of the respondents in Sekhukhune District reported that they were unable to eat healthy and nutritious food (Table 64).

Table 64: Households which were unable to eat healthy and nutritious food

		Households were unable to eat healthy and nutritious food							
		Never		Rarely		Sometimes		Often	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
District name	Capricorn	69	21.0%	58	17.6%	130	39.5%	72	21.9%
	Sekhukhune	72	17.7%	59	14.5%	171	42.0%	105	25.8%
	Mopani	77	20.1%	50	13.0%	145	37.8%	112	29.2%
	Vhembe	120	29.8%	43	10.7%	150	37.2%	90	22.3%
	Waterberg	74	22.9%	26	8.0%	115	35.6%	108	33.4%

Table 65: Households which could not access the cheap and affordable food market, because they were shut down due national lockdown restrictions

		Households which could not access the cheap and affordable food market, because they were shut down due national lockdown restrictions					
		Never		Rarely		Sometimes	
		Count	Row N %	Count	Row N %	Count	Row N %
District	Capricorn	132	40.1%	46	14.0%	99	30.1%
	Sekhukhune	95	23.3%	73	17.9%	155	38.1%
	Mopani	92	24.0%	58	15.1%	131	34.2%
	Vhembe	127	31.5%	42	10.4%	152	37.7%
	Waterberg	82	25.4%	35	10.8%	125	38.7%

Most households across the districts reported that sometimes they could not access cheap and affordable food markets since they were shut down because of the COVID-19 national lockdown restrictions. However, this was mostly experienced in Sekhukhune and Waterberg (Table 65).

Table 66: Household heads who were hungry but did not eat

		Household heads who were hungry but did not eat							
		Never		Rarely		Sometimes		Often	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
District name	Capricorn	163	50.2%	59	18.2%	73	22.5%	30	9.2%
	Sekhukhune	186	46.3%	91	22.6%	92	22.9%	33	8.2%
	Mopani	161	42.5%	70	18.5%	111	29.3%	37	9.8%
	Vhembe	235	58.5%	77	19.2%	74	18.4%	16	4.0%
	Waterberg	140	43.9%	71	22.3%	62	19.4%	46	14.4%

Table 67: Household head who had to skip a meal

		Household head had to skip a meal							
		Never		Rarely		Sometimes		Often	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
District name	Capricorn	165	50.3%	63	19.2%	65	19.8%	35	10.7%
	Sekhukhune	166	41.2%	82	20.3%	106	26.3%	49	12.2%
	Mopani	141	36.8%	81	21.1%	113	29.5%	48	12.5%
	Vhembe	219	54.3%	47	11.7%	S	21.6%	50	12.4%
	Waterberg	126	39.1%	52	16.1%	80	24.8%	64	19.9%

Although skipping a meal was least reported across all the districts of Limpopo, in Waterberg, it was often high (19%) compared to other districts. In Sekhukhune (26%) and Mopani (30%) they sometimes had to skip meals (Table 67). This is also attributable to the fact that these are not major food crop producing districts since they experience dry spells and poor soil conditions. Hence households would rely entirely on buying food which was limited due to restricted markets and high food price.

Table 68: Households who ran out of food

		Households who ran out of food							
		Never		Rarely		Sometimes		Often	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
District	Capricorn	141	43.4%	62	19.1%	77	23.7%	45	13.8%
	Sekhukhune	162	40.2%	79	19.6%	107	26.6%	55	13.6%
	Mopani	134	35.1%	77	20.2%	113	29.6%	58	15.2%
	Vhembe	209	51.9%	71	17.6%	92	22.8%	31	7.7%
	Waterberg	123	38.4%	50	15.6%	86	26.9%	61	19.1%

Table 69: Household heads who went without eating for a whole day

		Household heads who went without eating for a whole day							
		Never		Rarely		Sometimes		Often	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
District	Capricorn	222	68.5%	50	15.4%	30	9.3%	22	6.8%
	Sekhukhune	237	59.4%	67	16.8%	68	17.0%	27	6.8%
	Mopani	181	47.6%	70	18.4%	97	25.5%	32	8.4%
	Vhembe	253	62.8%	79	19.6%	57	14.1%	14	3.5%
	Waterberg	178	56.7%	48	15.3%	55	17.5%	33	10.5%

Results show that it was very rare for the household to go without eating for the whole day. About 10% of the households in Waterberg often went the whole day without eating during the COVID-19 pandemic, whilst an almost similar percentage of households (8%) followed a similar trend in Mopani. About 26% of the households in Mopani sometimes went the whole day without eating (Table 69).

Discussion

High food prices were the major shock that most households in Limpopo Province experienced as reported from both household survey and HEA focus group discussion results. This is true since the study period coincided with the outbreak of the COVID-19 pandemic, which disrupted the food supply chains. The COVID-19 pandemic resulted in the declaration of a national disaster by the national president, resulting in national lockdown measures that blocked interprovincial movement and this limited movement, especially by seasonal farmworkers. This meant that there was limited transportation of food from one area to another, causing food shortages, and prices, particularly of nutritious food, increased due to reduced supplies. This was also exacerbated by reduced disposable income among vulnerable households who could not perform their seasonal and routine menial jobs to sustain their lives. However, the situation was eased to a lesser extent through the distribution of food parcels by the government and NGOs, even though these were not

enough for all the vulnerable households. The government also introduced other safety nets, such as the COVID-19 monthly allowance for all unemployed South African adults. Similar findings of rising food prices were reported by Mkhawani et al. (2016) from a study in the Mopani District in Greater Tzaneen municipality, where the majority (58%) of participants indicated that their eating habits had changed owing to rising food prices. Approximately 60% of the participants indicated that they bought food in bulk as a short-term strategy to cope with rising food prices.

As a coping mechanism, Mkhawani et al. (2016) reports that approximately 50% of the households had a vegetable garden to alleviate food unavailability for subsistence purposes. The majority (57%) of participants resorted to buying cheaper brands, such as generic store brands. In addition, rising food prices made high quality food scarce for poorer households, forcing them to resort to cheaper or less nutritious foods, as similarly reported in this NFNS where the HEA discussion revealed that some households survived by eating 'pap'². Despite the challenges of rising food prices, very few households reported having to go the whole day without eating anything. However, skipping eating meals per day as a coping mechanism for limited food availability was widely implemented by most households in Sekhukhune and Mopani districts, compared to other districts. This was expected, given the limited own food production through agriculture that is common in these two drought prone districts. As a result of the effects of the COVID-19 pandemic, most households had to adjust their feeding habits as copying strategies. Most of the common coping mechanisms included skipping meals and resorting to eating cheap high energy dense foods.

The recurring droughts experienced across the five districts of Limpopo was one of the major shocks reported by the households. Most households from Mopani and Sekhukhune were severely affected by drought, relative to other districts. This has led to crop failure resulting in poor harvests and eventually limited food availability. Similar findings have been reported in the Limpopo Province for example, Maponya and Mpandeli (2012) reported a very bad outlook of rainfall patterns in which the probability of receiving above normal rainfalls was below 50% in Sekhukhune and Capricorn districts. Similarly, Mpandeli (2005) argues that drought is a recurring problem in the Limpopo Province. The persistent drought situation is also supported by Kruger and Shongwe (2004) who found that there was a significant increase in temperature between 1960 to 2003 for Polokwane, Bela-Bela, and Musina stations in the Limpopo Province. This condition has led to occurrence of droughts around the Capricorn District and has made most communities vulnerable to food scarcity. Another persistent challenge widely reported was the water shortage, which was much more prominent in Sekhukhune (41%) and Capricorn (39%) districts. Limited availability of water results in limited agriculture-related activities such as irrigation and gardening for own food production. The results corroborate with other studies.

² Pap is a local native name for popular maize meal-based meal prepared for its high calorific value and is usually consumed with meat and vegetables.

10.1 Key findings

Food security is one of the strategic imperatives for South Africa as outlined in many governments policy documents, including the Constitution and the National Development Plan. The right to have access to sufficient food by all citizens is enshrined in the Constitution of the country. This survey provides a baseline assessment of the food and nutrition security situation of households in the Limpopo Province. The findings presented in this report provided insights regarding the food and nutrition security status across the four dimensions of food and nutrition security in the province.

Demographics characterisation

More than half of the household heads were females, and largely Africans. The heads were mostly middle-aged, with significant proportions, especially women, with no schooling. Very few of the household heads had tertiary qualifications. There was generally very high unemployment levels in the sampled areas, particularly among the female-headed households. Most households earned less than R3,000 per month, and social protection play an important role in providing a major socio-economic safety net, with the majority of households being recipients of CSG and OAG. While most of the households had access to social grants, the amounts received are not enough to eradicate hunger, food insecurity, and malnutrition. Almost half of the households (46%) were registered as indigents. Households generally had access to safe drinking water and improved sanitation.

Socio-economic status, health, and well being

This survey has revealed that there are socio-economic challenges that include limited food production at household level, high dependencies on social grants, acute unemployment, especially among women and youth, and dwindling household incomes expose households to food and nutrition insecurity. Despite the high levels of unemployment and inadequacy of social grant income, few households were involved in farming activities. Most households relied on food purchases, which left them vulnerable to volatile food prices and inflation. Households' access to land was generally limited in the study area, but the land they use is generally very small, averaging less than a quarter of a hectare.

Access to land and agriculture production

Subsistence farming in rural areas of Limpopo Province has been limited by climate change, inadequate support and services (such as extension, information, and infrastructure), and was further exacerbated by the COVID-19 pandemic, which had accumulated effects on food and nutrition security.

Involvement in agriculture was generally low and in line with national agricultural participation statistics, with districts like Mopani and Vhembe having relatively moderate numbers of participation. The majority of households produced food from small plots resulting in low production that is inadequate to sustain them with a secure food supply. The majority of the produce grown are cereals, citrus, and fruits. Livestock production was reported to be common in Sekhukhune and Waterberg districts, with chickens, cattle, and goats being dominant. 'Better-off' households with larger pieces of land sold most of their produce, only for them to purchase food including staples (selling of un-milled own-produced grain rather than own grain consumption was preferred, and purchasing of mealie for consumption) further exposing even the 'better-off' households to market related shocks. Despite being involved in agricultural activities, the purchases still made up the largest proportion of people's sources of food, mostly for 'very poor' and 'poor' households, and thus

exposing them to market related shocks. An untapped potential for livestock and livestock products usage as a livelihood strategy is observed. Selling of livestock was practised by the least number of households even in times of food shortage. Dairy production was not commensurate with herd sizes and livestock ownership in general; a very small fraction of cows is milked for consumption. As a result, food and cash income from livestock and products is low for the numbers of animals present.

Food security indicators

Several food security indicators (such as the Household Food Insecurity Access Score (HFIAS), Household Hunger Score (HHS), and Food Consumption Score (FCS) and Household Dietary Diversity Score (DDS)), indicated that many households were facing food access challenges in Limpopo. The HFIAS revealed that 59% of the households are food insecure with 11% of the households being severely food insecure. Most of the households experienced no hunger to little hunger when food access was measured through HHS. On average, households consumed above average (HDSS>6) dietary levels as indicated through the HDSS. However, this does not always mean that households consumed healthy foods with the required micronutrients. Further analysis indicated that households mostly consumed food groups such as cereals, condiments, sugars, and oils/ fats, and there was limited consumption of food groups such as fruits, pulses and nuts, eggs and fish, and seafood. The FCS indicated that a significant proportion of households (35.9%) consumed poor diets. While female-headed households were significantly more food insecure than male-headed households, they were likely to consume better diets.

Nutrition indicators

The prevalence of malnutrition remains a public health problem in Limpopo Province. Most of the children were immediately breastfed. But breastfeeding of children in the ages of 0=24 months was generally stopped between the ages of 3-4 months. In general, malnutrition was prominent among children under the age of five years. More than half of the adults - 18 years and older - were overweight, which is a health concern. The overall prevalence of stunting in children under the age of 5 years was found to be 18.3%, of which 10.0% was severe, and 8.4% was moderate. The prevalence of wasting for children under the age of 5 years stood at 7.7%, of which 4.3% was severe, and 3.5% was moderate wasting. Underweight for children under the age of 5 years was 11.5%, of which 6.3% was severe, and 5.2% was moderate underweight. Overweight for children under the age of 5 years (n=311) was 8.6%, of which 4.7% was severe, and 3.8% was moderate overweight. Overall, the results depict a pronounced nutrition crisis in the Limpopo Province. Household food insecurity was found to be a key driver of malnutrition in both children and adults in the province. Stunting, wasting, and underweight were more likely among food insecure households than food secure households. On the other hand, 'overweight' and 'obesity' were likely to occur among food secure households. These results demonstrate South Africa's dual nutrition problem, where occurrence of undernutrition occurs, together with overweight and obesity in similar communities. Given the high levels of household food insecurity in Limpopo, the government should develop and implement several interventions that improve food security in the Limpopo Province. These include land access, inputs provision, and empowering women headed households. The next sub-section presents some of these recommendations.

10.2 Recommendations

- While a sizeable number of households were involved in agricultural activities, the study revealed that many households did not participate in farming in Limpopo. As such, there is a huge reliance on food purchases, from income that is mainly received from social grants. Focus group discussions generally revealed a lack of young people's participation in agricultural activities. To revitalize rural economies and improve household food security, the government and other stakeholders should implement strategies to motivate and/or attracting household members, especially the youth, to be involved in farming activities. A key strategy is to make farming profitable (through market support, agro-processing, prices, etc.), as well as 'sexy' (e.g., introducing smart farming). Given the limited potential of labour absorption in the non-farm sectors, it is clear that farming will continue to have a role in addressing the food security challenge facing communities, especially in rural areas.

- Among other challenges, water shortage and recurrent drought emerged as part of the major shocks that have dissuaded people from farming. This implies that there is a need for a well thought-out water provision program in Limpopo Province for household use and for agriculture production purposes. Possible interventions could be the construction of dams for irrigation, and a domestic water reticulation system at the household level.
- Promotion of projects and programmes that encourage good hygiene practices, such as use of latrines and washing hands with soap after using the toilet, is crucial.
- Breastfeeding promotion, growth monitoring for improved case detection in children who need care, appropriate referrals, and management of acute malnutrition, coupled with appropriate messages on complementary feeding, remain key interventions that need to be done. There is a need to scale-up multiple micronutrient supplementation during pregnancy, calcium supplementation to mothers at risk of low intake, promotion of maternal balanced nutrition, use of iodised salt, deworming, and vitamin A and zinc supplementation for children under 5 years of age.
- Nutrition assessment of children under five at all points of contact should be strengthened. More focus should be given to the first 1 000 days of a child's life. Nutrition assessment during pregnancy and appropriate management of pregnant women who are underweight or with poor weight gain should be strengthened during basic antenatal care services.
- Households need support in some months of the year (mainly January and June) to avoid negative consumption reduction practices, and incidence of seasonal hunger. Interventions that seek to help households budget and save in anticipation of lumpy expenditures are crucial to ensure year-round food security.
- Enlightenment about the importance of micro- and macro-nutrient consumption is a crucial, food security programme that must be formulated to focus on the production and consumption of foods aimed at improving the identified deficient micro-nutrient at the household level. Interventions in food preparation, meal planning, and nutrition advice to support home production of fresh produce is required for improved dietary diversity in the households.
- These interventions, together with full scale implementation of other nutrition sensitive programmes and approaches such as school feeding, agriculture and food security enhancement programmes, social safety network, early childhood nutrition, women empowerment, child protection, water, sanitation and hygiene, and other health and family planning services in an enabling environment will greatly reduce morbidity and mortality in childhood, the incidence of obesity and non-communicable diseases, while on the other hand contributing to the improvement of cognitive, motor socio-emotional development, school performance and learning capacity, adult stature, and work capacity and productivity.
- Promotion of domestic food production: This will involve encouraging families to produce their own food to ensure food security at household level. In Limpopo, most families rely on food purchased from supermarkets, formal, and informal traders. This is unsustainable and makes households more vulnerable to food insecurity.
- Focused investment and the establishment of food banks - Creating an enabling environment for commercial food production: There is a need to increase agricultural production in each district through focused food production and agro-processing investments. The province of Limpopo, through districts of Vhembe, Mopani, and Sekhukhune, has the potential to produce enough food for consumption within the province. These districts could serve as hubs where various food types are produced for local consumption in the province. These can be distributed through fruit and vegetables markets that can be strategically located close to vulnerable households in all districts of the province. The markets may also serve as food banks where items imported elsewhere could be sold at affordable prices. The districts of Capricorn and Waterberg - due to the unavailability of land - can be considered for this establishment of food banks.
- Focus on employment creation - Targeted intervention through an agric-sector employment creation drive: A combination of high levels of unemployment and dwindling incomes means that vulnerability to food insecurity will always remain high.
- Land redistribution and restitution: Most households reported limited access to land, hence there is a need for deliberate land apportionment to empower the vulnerable, especially women and the youth.

Competing priorities for land pose a threat to agriculture production. Considering this, the government is tasked to provide priorities for land use. People seem to prefer obtaining big pieces of land and use it to build houses rather than food production. Adherence to this will increase and sustain agricultural production in rural areas of South Africa. The policy has the potential to allow agriculture to serve as a significant source of income for households.

- Investment in post-harvest agro-processing: Although some households were found to be involved in agricultural activities, these are not sustainable and cannot ward off household vulnerability to food insecurity. A food system that encourages and enables households to process and consume what they produce locally is needed. Households need support in some months of the year (mainly January) to reduce consumption patterns and incidence of seasonal hunger. Interventions that seek to help households budget and save in anticipation of lumpy expenditures are crucial to ensure year-round food security. Awareness raising to enlighten households about the importance of dietary diversity for improved nutrition is crucial. Implementation of nutrition sensitive food security programmes by all sectors should be initiated.
- Enhancing food Safety: Informal traders and small businesses that trade with agricultural products need assistance to help them improve the quality of their services through quality assurance and extend the lifespan of their products. COVID-19 has irreversibly transformed human perception of food and food safety. As a result, people have realized the importance of consuming safe and healthy food, not only to boost one's immune system but also to prevent the spread of diseases. As revealed in this study, people do not have equal access to safe and healthy food. For most poor people, informal traders are the main source of food. It is for this reason that a proposal to integrate food safety and quality standards in the operations of informal traders and small to medium enterprises is being made here. This will improve the quality of food items traded, and increase the profits of informal traders.

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