National Food and Nutrition Security Survey

MPUMALANGA PROVINCE REPORT

FOOD AND NUTRITION SECURITY

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

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Department: Agriculture, Rural Development, Land and Environmental Affairs
MPUMALANGA PROVINCIAL GOVERNMENT

National Food and Nutrition Security Survey Mpumalanga Province Report

Published in 2023 by the
Human Sciences Research Council
Private Bag X41
Pretoria 0001
South Africa

ISBN: 978-0-7983 0538-9

Document Report: National Food and Nutrition Security Survey (NFNSS)
Document Type: National Survey Report

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Printer: CapitalPress

Citation: Simelane, T., Mutanga, S., Hongoro, C., Parker, W., Mjimba, V., Zuma, K., Kajombo, R., Ngidi, M., Masamha, B., Mokhele, T., Ngungu, M., Sinyolo, S., Managa, R., Tshililo, F., Ubisi, N,. Skhosana, F., Muthige, M., . Dukhi, N., Sewpaul, R., Mkhongi, A., Ndinda, C., Sithole, M., Lunga, W., Tshitangano, F., Marinda, E., 2023. National Food and Nutrition Security Survey: Provincial Report: Mpumalanga Province. HSRC: Pretoria.

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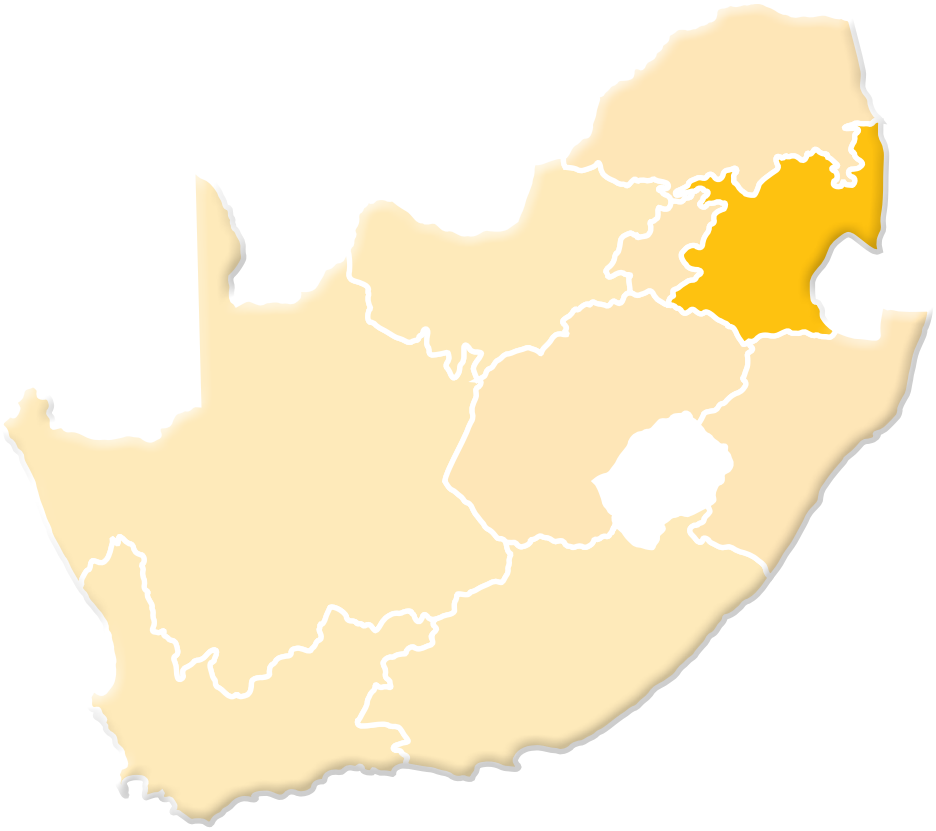
List of Abbreviations

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 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
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
ZABOL	Highveld Border Open Access Livestock
ZAHIC	Highveld Open Access Intensive Cropping Livelihood Zone
ZAHMI	Highveld Open Access Mixed Income (ZAHMI) Livelihood Zone



Acknowledgements

This report is a product of many contributors whose input is acknowledged. The research team wishes to extend words of gratitude to the following:

- The Department of Agriculture Land Reform and Rural Development for the opportunity it granted the research team to conduct this survey
- Mpumalanga Provincial Department of Agriculture and Rural Development for its support and contribution
- Community Leadership for the permission they granted to allow their communities to participate in the survey
- Officials from the district and municipal offices for their support and contributions
- The data collectors who worked earnestly to ensure that data was collected
- HSRC staff who endeavoured to ensure that the study was a success
- Experts for sharing their knowledge with the research team and data collectors.

Disclaimer

This report is based on the empirical evidence collected from selected Small Area Layers (SALs) within the five districts of Mpumalanga 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 35 visiting points (households). The results provide a baseline assessment of the status quo of food and nutrition security in the province. The data was collected during COVID-19 lockdown around September-October 2021. This greatly influenced and changed the picture from what would ordinarily obtain under a normal situation. The project benefited from the valuable insights and input of the advisory board that provided comments and reviewed the research reports. Albeit they cannot be held accountable for errors or omissions that may exist in the report. 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, including but not limited to child support, school feeding scheme, farmer support programmes and many others, 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 major concern and a reality for several millions of people in South Africa. Strong perceptions and evidence exist 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, wasting and being 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 national level. The concentration and distribution of these food insecure 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) as 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 assess the impacts of COVID-19 on household food nutrition security (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 3 districts of the Mpumalanga 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 2 485 visiting points (VPs), 96.2% were valid. Out of these valid VPs, 67.2% of them were realised. A total of 1 611 people were interviewed in this province, when weighted, this total represents 3 076 875 South Africans 18 years and older living in Mpumalanga 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 Mpumalanga Province. The HFIAS revealed that only 29% of households were food secure, with the remaining 71% of the household's being food insecure. Of those who are food insecure, 22.2% experienced severe levels of food insecurity. The HHS showed that 71.6% of households experienced little to no hunger, while 20.6% and 7.7% of households experienced moderate hunger and severe

hunger, respectively. The FCS and HDDS showed that over 47% and 84%respectively consumed an acceptable number of food groups across all the districts. The FCS indicated that 23% of households consumed poor diets, while 30% consumed borderline diets. However, the households mostly consumed nutrient poor food groups such as cereals, condiments, sugars, oils/fats, and there was limited consumption of nutrient rich food groups such as fruits, pulses, nuts, eggs, fish and seafood.

The levels of food insecurity did not vary much across districts. While severe food insecurity was more prevalent in the Nkangala district, where 26% of the households were severely food insecure and above 8% experienced severe hunger as determined by HFIAS and HHS, respectively. Additionally, households from the Nkangala region had poor diets (23.0%) and the lowest dietary diversity (5%). Other districts, namely, Ehlanzeni and Gert Sibande, both had 20% of households experiencing severe food insecurity and a hunger score of 8% and 7%, respectively. Severe food insecurity was more prevalent across all age groups. With the least being the 35-44 age group with a 19% proportion.

Significant relationships were found between household food security status and some demographic and socioeconomic factors such as gender, age of household head / acting head, access to irrigation, 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 status 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 15.5% of households headed by people with no education were food secure compared to 55.6% of households headed by people with tertiary qualifications. Farming activities played a significant role, suggesting that dealing with food insecurity in a province such as Mpumalanga is dependent on agricultural activities as well as the expansion of social protection measures (such as social grants) and creating employment opportunities.

The findings indicate that 84% 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 28.5%, 6.0% and 9.4%, compared to 40.7%, 3.1% and 13.3% in 2012. These results indicate that the proportion of children experiencing acute and chronic undernutrition has decreased over the past 10 years. Over the same time period, the combined prevalence of overweight and obesity in adult females has increased slightly from 62.0% to 70.9%, while that of adult males have remained more or less the same 30.4% to 30.1%. Across the districts, Gert Sibande has the highest prevalence of severe stunting (19.7%), severe wasting (7.2%) and underweight (4.4%), followed by Nkangala and Ehlanzeni, respectively, across the various indicators. 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 insecure households. However, there were significant correlations between food security and nutrition indicators for adults. Table A shows the summary of the food security and nutrition indicators.

The survey also showed that COVID-19 pandemic, and the lockdown measures introduced to curb its spread led to serious disruptions in food supply chains and production systems. The increase in food prices was the biggest shock experienced across all three districts of Mpumalanga Province. The highest shocks were experienced in Gert Sibanda and Ehlanzeni districts, with 79%, and 74%, respectively. Gert Sibande District had the highest percentage (41.3%) of households who were sometimes worried about their food running out before they could get money to buy some more food. Gert Sibande and Nkangala districts also had the highest percentages of 36.4% and 33.9%, respectively of households who reported that their food often runs out and they did not have money to buy more.

Several recommendations are proposed revolving around strategies for the promotion of household food production, improvement of household incomes through employment creation, development of a clear path for ensuring water security to adapt to changing climate, enhancing food safety, investment in post-harvest agro-processing, intrinsic land access, the establishment of food banks, promotion of domestic

food production, improved awareness of micro and macronutrient consumption interventions, together with full-scale implementation of other nutrition-sensitive programmes. Table A below provides a summary of selected food security and nutrition indicators for Mpumalanga Province.

Table A: Mpumalanga 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
Ehlanzeni	29.0	50.0	20.0	72.0	20.0	8.0	87.0	10.0	2.0	49.0	32.0	19.0
Gert Sibande	26.0	54.0	20.0	75.0	18.0	7.0	83.0	14.0	3.0	48.0	29.0	22.0
Nkangala	31.0	43.0	26.0	68.0	24.0	8.0	79.0	15.0	5.0	43.0	30.0	28.0
Province	29.0	48.7	22.2	71.6	20.6	7.7	84.0	13.0	3.0	47.0	30.0	23.0

DISTRICTS	FOOD SECURITY INDICATORS (%)											
	STUNTING			WASTING			UNDERWEIGHT			ADULT BMI		
	All	Moderate	Severe	All	Moderate	Severe	All	Moderate	Severe	Underweight	Overweight	Obese
Ehlanzeni	14.6	8.2	6.4	4.8	3.8	1.0	2.9	0.5	2.4	4.2	25.4	23.5
Gert Sibande	39.2	19.5	19.7	10.6	3.3	7.2	18.5	14.1	4.4	4.7	29.8	33.0
Nkangala	28.6	10.1	18.5	3.8	0.3	3.6	7.3	7.3	0.0	6.4	21.4	37.7
Province	28.5	12.3	16.2	6.0	2.0	4.0	9.4	7.6	1.8	5.1	25.7	31.7

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% +

1 Introduction

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 this 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). According to recent estimates, the number of people who have insufficient and extremely insufficient access to food increased by 843 080 from 13.7 million to 14.4 million in 2021 (Stats SA, 2021).

Food security is a multi-dimensional concept[1], 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 economic activities. 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 NFNSS, can generate such data and evidence, that is representative at the district levels. The NFNSS 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 Mpumalanga Province, in terms of:
    a. **Availability: t**o 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 the 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 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).

2 Background

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 seeks 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, 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 Mpumalanga 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. The General Household Surveys (GHS) cover approximately 32 000 households annually since 2002, but do not include nutrition indicators. They focus 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-district) by rural/ urban divide, or for both rural and urban as defined by the livelihood zones.

3 Methodological Matrix

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 individual and household experiences.. Figure 1 provides an overview of the food security continuum.

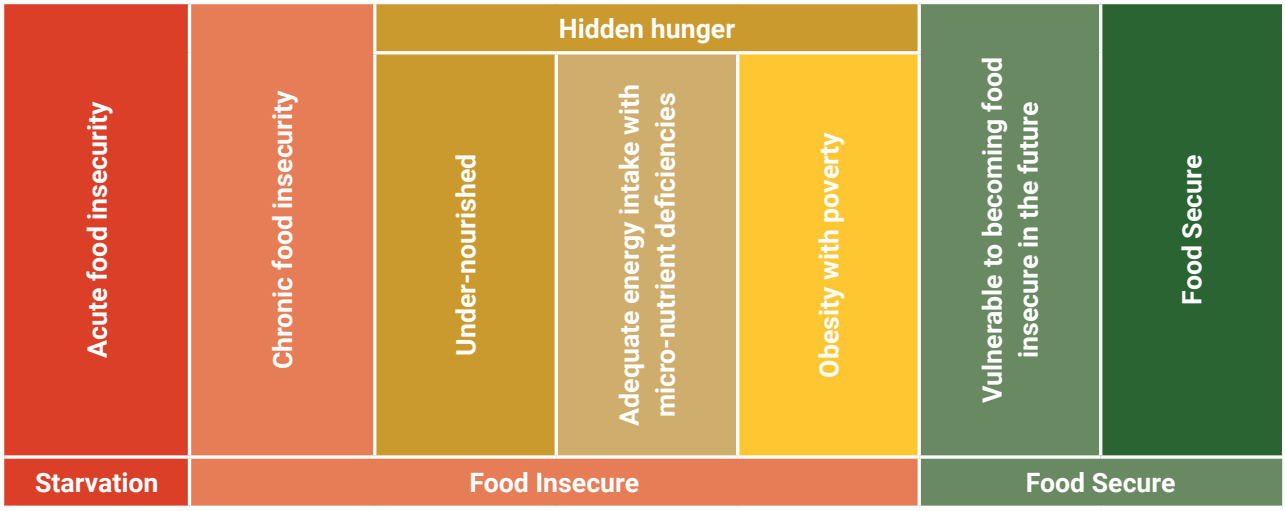


Figure 1: *Food Security Continuum (Hendriks, 2016)*

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	• Production • Post-Harvest	6	Household Economic Approach
	Access	• Hunger Scale (12months) • Hunger Scale (4Weeks) • HFIAS	7 A, B, C, D 9	
	Stability	• Food expenditure • Key Informant Interviews • Shocks	8, 11, 12	
	Utilisation	• 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 (HEA)

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, and 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 Survey Design and Sampling

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 71 SALs. The second stage was a simple random selection of households within each selected SAL/Cluster, and for this study, we selected 35 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 Mpumalanga 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, e.g., 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, Mpumalanga Province is divided into 3 districts and 17 local municipalities (mixed urban and rural). In this study, the smallest geographic unit is the small area layer (SAL) composed of 35 households sampled. Given the heterogeneity in livelihoods within regions, the province has 3 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).

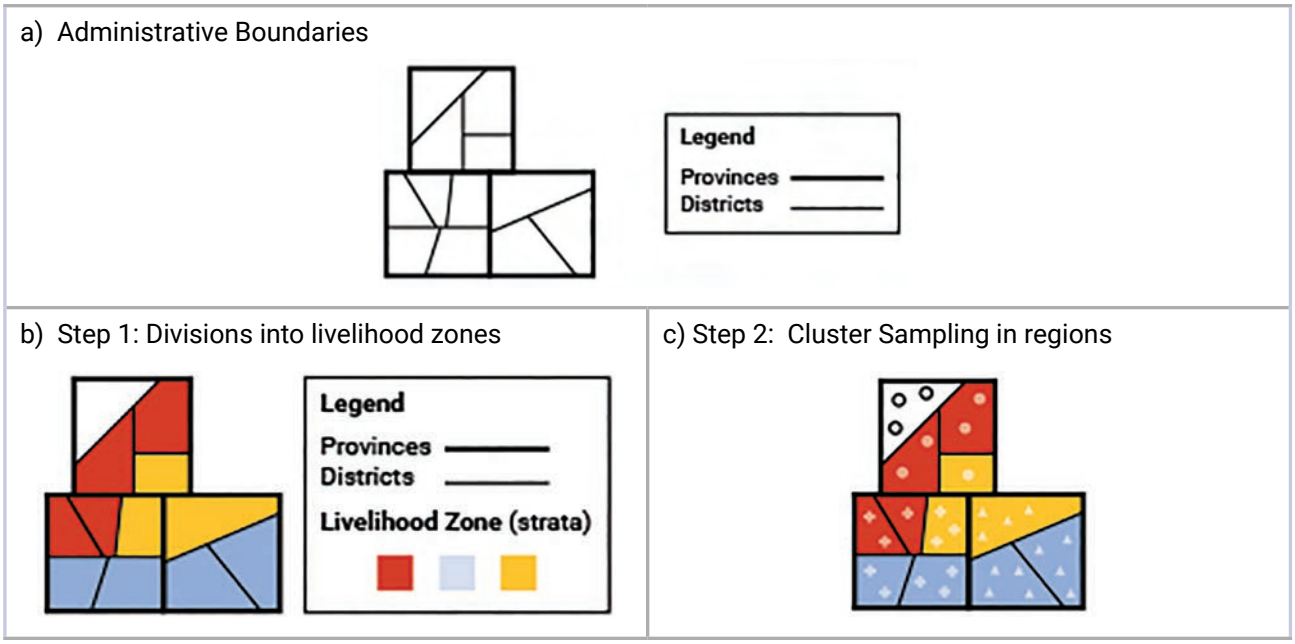


Figure 2: *Schematic representation of the overlay of administrative boundaries and LHZ*

Stratification by administrative boundary and livelihood zones serves two functions:

I. First, administrative boundaries rarely correspond with household characteristics related to food insecurity and 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 3 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 are eligible for the survey, on condition that their parent or caregiver 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 was denied by the adult household member approached by the survey team.
- Individuals in selected households are ineligible if consent for individual participation is 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 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 allows 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, and the following was applied:

- 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 was 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 non-response 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.

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

- »95% degree of confidence (Z Score=1.96);
- »P is 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 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**	**17992**

A sample of 401 households per stratum (district) provides 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 adopted for Mpumalanga Province, with an average of 480 households per district (Table 3). A lower precision, e.g., 7%, recommended for lower geographies, yields 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 for nutritional indicators survey

The sampling did not aim at providing an estimate of malnutrition at 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% (SANAHNAES 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 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 the study was 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 71 SALs, across 3 districts in the province. Within each SAL, a random sample of 35 visiting points was identified. One household was to be selected at each visiting point. This yielded a total sample size of 2 485 households. Once a household was selected, specific household members were eligible to participate in the survey (as per the inclusion and exclusion criteria set, refer to 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. We had estimated that, on average, each household will yield 3 people. The total sample was thus 2 485. The survey managed to get 395 children of 5 years and below 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 the number 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.

We adopted the World Food Program (WFP) Technical Guideline which defines a cluster based on SALs, cluster size or the number of household survey teams that can visit safely in one day, and the number of clusters with a number of households in each for each indicator. Uually, 20 to 30 clusters/EAs per stratum are typical for most settings (Technical Guideline, WFP- see Appendix I). In this province, 35 households per cluster or (SAL) were thus used.

4.4.3.1 Household Response Rate

Out of the targeted 2 485 visiting points (VPs), 96.2% were valid. Out of these valid VPs, 65% of them (1 611) were realised or interviewed while the refusals accounted for 9%. Absent or 'Other' constituted 23%. 'Other' included those who were not eligible to participate, such as those who were incapacitated, were under-age and had no adult to consent, were not at home for the duration of the study, and those who could not participate due to COVID-19 exposure. Ehlanzeni recorded the highest realisation with 75.3%, while Gert Sibande accounted for the least percentage with 60.2%. Table 4 shows characteristics of household heads from the households that were realised.

Table 4 depicts characteristics of household heads from the households that were realised.

Table 4: Household response rate by district

	Total VPs	Valid VPs		Interviewed		Refused		Absent/Other	
District	**n**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Gert Sibande	805	763	96.3	477	60.2	103	13	212	23.1
Nkangala	840	766	97.1	518	65.7	68	8.6	203	22.9
Ehlanzeni	840	778	95.1	616	75.3	51	6.2	151	13.6
Total	**2485**	**2307**	**96.2**	**1611**	**64.8**	**222**	**9.3**	**566**	**22.7**

4.4.3.2 Delimitation of the Household Economic Approach

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, sources of food, and income and expenditure as stipulated by the key informants and focus group participants from various livelihood zones.

4.5 Field Data Collection

Data collection process in the field was preceded by training that 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 ensured that the fieldwork was consistent and rigorous, that it upholds the highest degree of ethical standards. Some of the broad undertakings enshrined in training included the Standard Operational Guideline for data collection in the COVID-19 environment, ethics, and the broader governance structure and team structure. (Refer to Operational Manual Annexure)

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 by 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 thermometer 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, among others:

» 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 that involved structured household questionnaire administration in the five districts. A total of 71 Small Area Layer (SALs) with a total of 2 485 households in each visiting point were pre-selected 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. (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.

- There was rigorous training on the data collection instruments i.e., Household Questionnaire, looking at all the dimensions of food security and the questions 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 Highveld Border Open Access Livestock (ZABOL) of Ehlanzeni and Gert Sibande districts

This livelihood zone lies on the Swaziland border of Mpumalanga Province, much of it on the highland ridge between the Nkomati River and Mpuluzi River (a small section around Fernie lies south of the Mpuluzi River and another section around Tjakastad is north of the Nkomati). It is a part of Chief Albert Luthuli Municipality in Gert Sibande District. The livelihood zone is also situated on the border of the country, with the crossing into Swaziland located at Oshoek. Nearby there are large agro-forestry plantations which also serve as employment for residents. Winters in the area are extremely cold. It is accessed by feeder roads that connect to the N17 Highway from Ermelo to Swaziland.

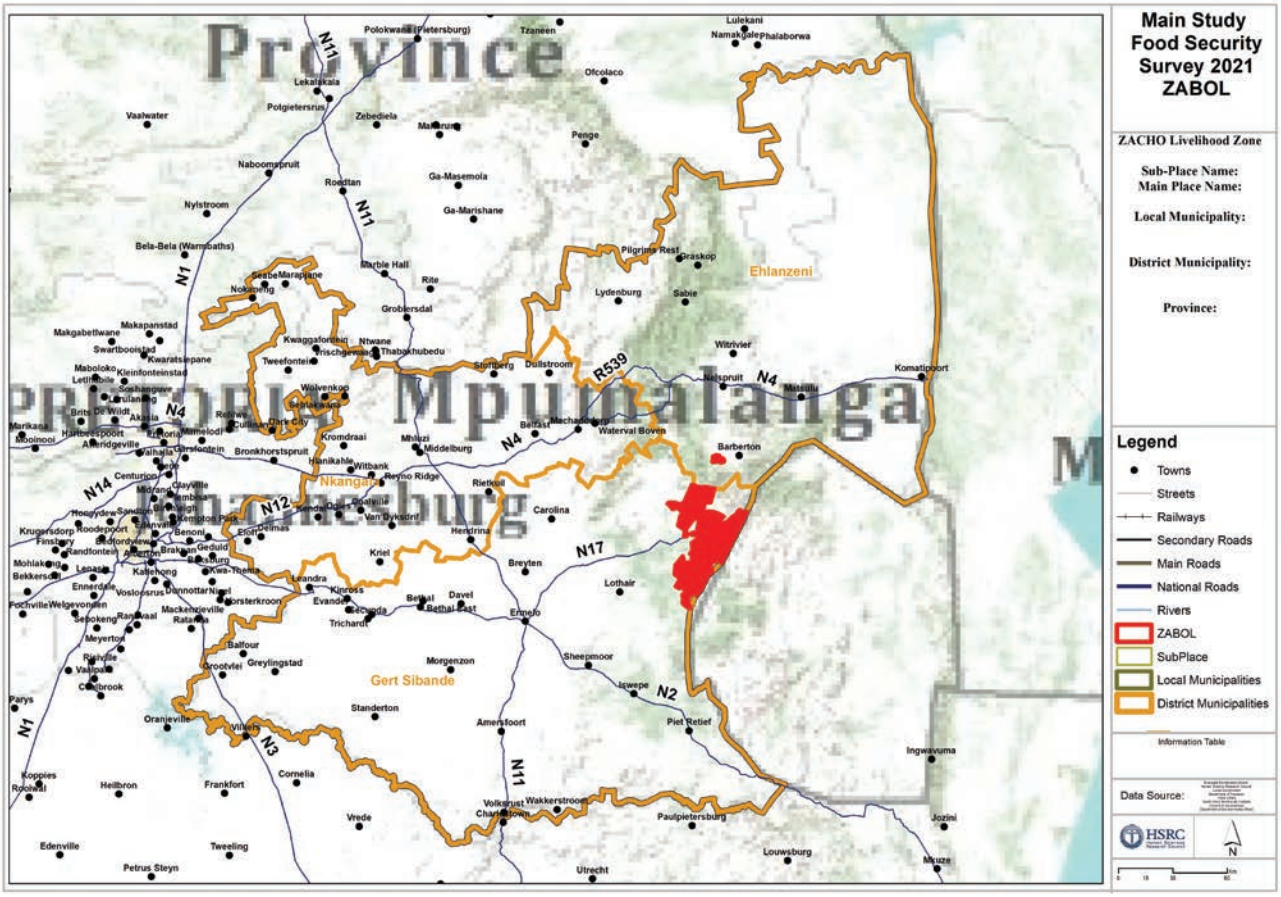


Figure 3: *Map of ZABOL livelihood Zone*

The zone receives rainfall that ranges from 500mm to 700mm; it is well-watered but mountainous, and characterised by poor soils and good pastures that lend themselves better to cattle husbandry.

Many households in the zone were forcibly removed from Carolina and settled in the area under the Group Areas Act during Apartheid. A minority of people migrated over the border from Swaziland. There are also some former commercial farmlands that have been resettled under the Land Redistribution for Agriculture Development (LRAD) grants programme. The livelihood zone also benefits from programmes such as the (CWZ). Crops are grown in the valleys, while livestock is grazed on the hills. Wealthier households keep cattle and goats, making use of the extensive grazing in the surrounding veld. Crops grown include maize, groundnuts, potatoes, sweet potatoes, beans, and vegetables. Households also depend on casual labour, remittances and grants; although formal sector jobs are scarce, and some households lack the necessary papers, such as identity documents required to obtain their grants.

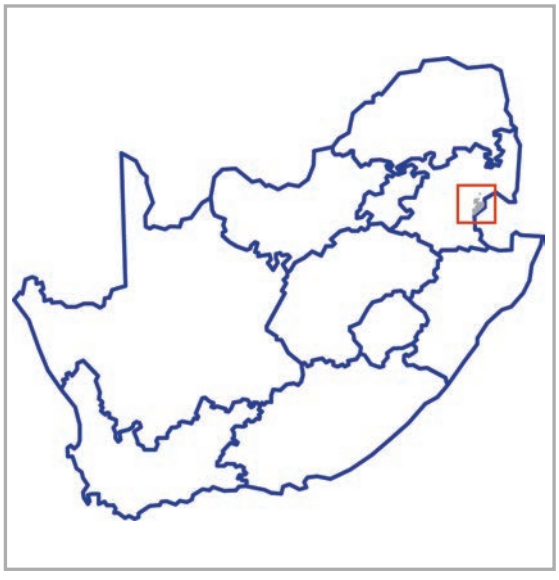


Figure 4: *ZABOL Livelihood zone location*

Table 5: 2016 Population breakdown of districts and municipalities covered by ZABOL Livelihood Zone, based on the 2011 Census and annual projections

Province	District	Municipality	Pop. Est. in ZABOL	% of Admin Level
Mpumalanga	Ehlanzeni	Umjindi	2,825	4.11%
	Gert Sibande	Albert Luthuli	127,186	62.44%

Figure 4 is a map of the zone and Figure 5 shows the location of the country. The zone is served by the N17 and the R541, as well as sealed side roads through Dundonald, Mpuluzi, and Fernie. Nhlazatje, Lochiel, and Mpuluzi are the main town centres that are located in the zone.

The livelihood zone has been given an alphabetic code (or abbreviation) of 'ZABOL' and the numeric code of 59104. These codes distinguish the zone both nationally and internationally, as well as allowing zone name changes and updates if desired (the code should always remain the same).

The zone is almost entirely located in one municipality: Chief Albert Luthuli, in Gert Sibande District and included approximately 127 000 people in 2016 (this excludes people living in the more urban centres). There is also a tiny section of the zone around Emnjandini Trust town centre in Umnjindi Municipality, Ehlanzeni District, although the zone only accounted for about 2 800 people in 2016 in the surrounding rural areas, and not the urban centre itself. The total population in the zone is 130 011 (in 2016, projected from the Census, 2011) which is 2.98% of the provincial total. Table 8 shows the breakdown for each

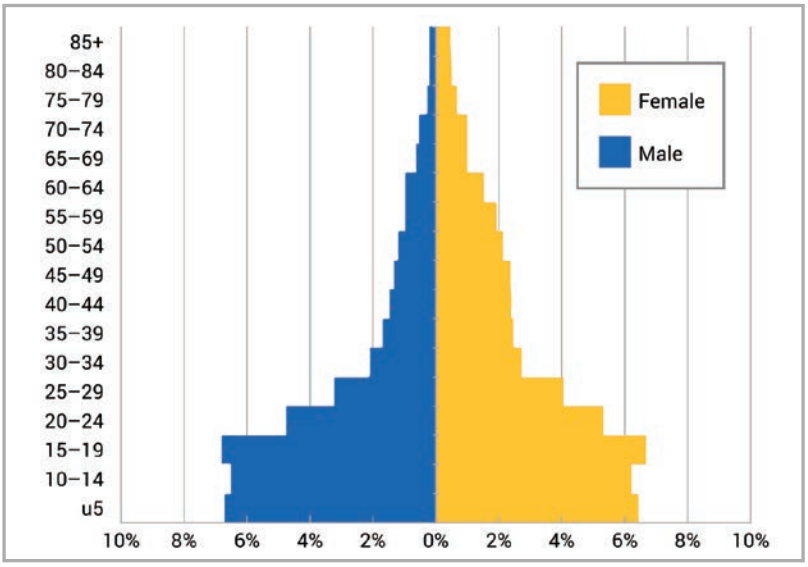


Figure 5: *Gender and age breakdown of the zone population*

The gender and age breakdown breakdown of the livelihood zone are given in Figure 6. There is a somewhat lower proportion of adult men than women in the livelihood zone as well as a high proportion of children (younger than 20). This unbalanced gender and dependency ratio is a continued consequence of apartheid, as most of the zone was a part of the former Bantustans, supplying labour to urban, industrial, mining, and commercial farming areas. The persistence of this pattern leads to shortages in the zone of human capital, which has impacts on productivity.

Highveld Open Access Intensive Cropping (ZAHIC) of Nkangala and Gert Sibande districts

This livelihood zone is located in the Highveld in good farming land. It consists of three sections:

- In the north, the largest section is a stretch of flat land straddling Mpumalanga (Dr JS Moroka and Thembisile municipalities of Nkangala District) and Limpopo (Ephraim Mogale Municipality in Greater Sekhukhune District) to the west of Marble Hall;
- In the south, a section in Mkhondo Municipality, Gert Sibande District, around Saul Mkhizeville in Mpumalanga west of Piet Retief Town; and
- A small area south of Amersfoort around Vlakpoort in Pixley ka Seme Municipality in Gert Sibande District.

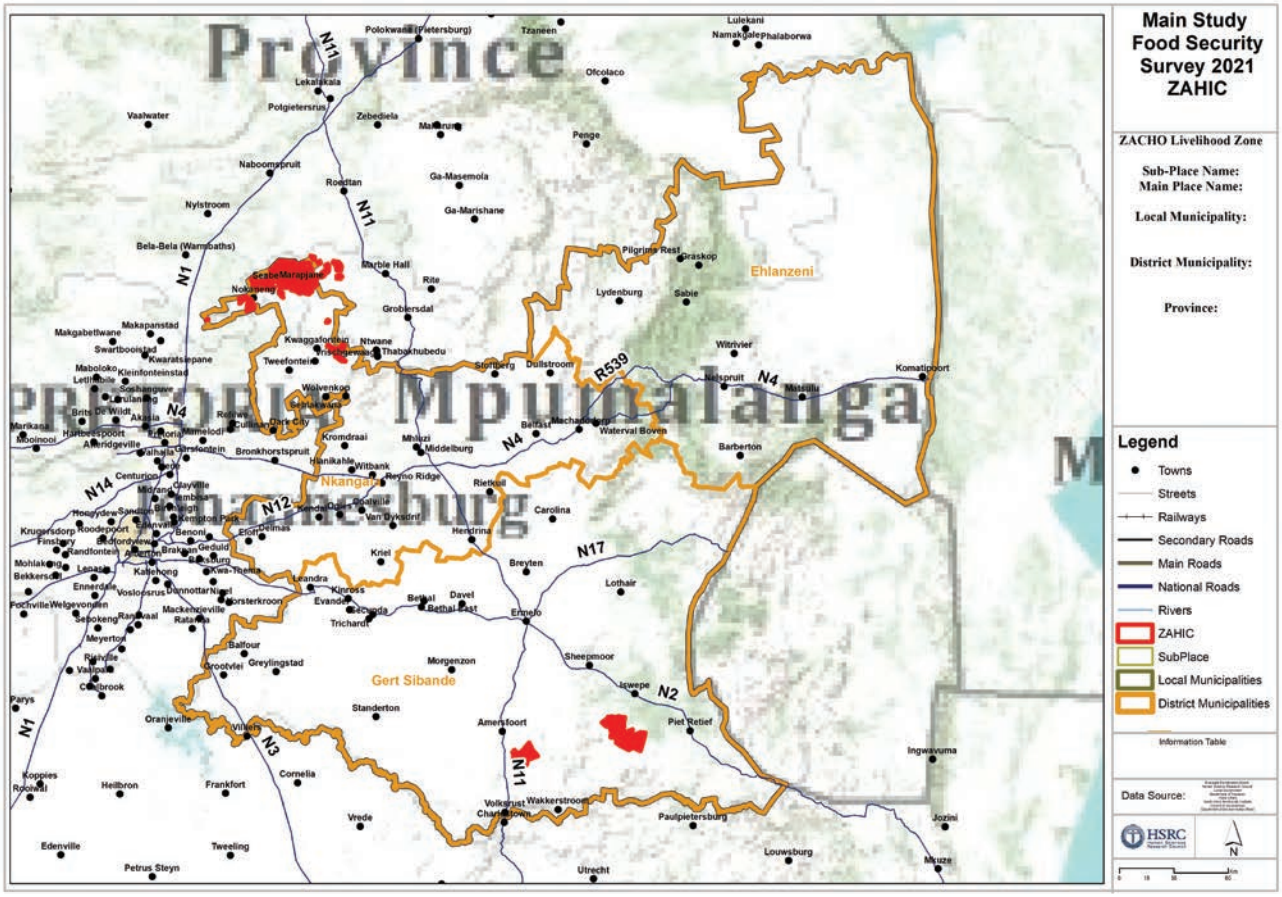


Figure 6: *Map of ZAHIC livelihood zone*

The northern section of the zone receives 300 to 600mm mean annual rainfall, while the two areas in the south receive 300 to 700mm, while temperatures vary from 7°C to 35°C in the north and –2°C to 33°C in the southern sections. The rainfall is highly variable and the high summer temperatures wither crops from transpiration. Wealthier households keep a few cattle and goats. Households also depend on casual labour, remittances, and grants.

Table 6: 2016 Population breakdown of districts and municipalities covered by ZAHIC Livelihood Zone, based on the 2011 Census and annual projections

Province	District	Municipality	Pop. Est. in ZAHIC	% of Admin Level
Limpopo	Greater Sekhukhune	Ephraim Mogale	32,093	23.75%
Provincial Total			**32,093**	**0.55%**
Mpumalanga	Gert Sibande	Mkhondo	30,065	15.96%
		Pixley ka Seme	16,965	18.62%
	Nkangala	Dr J.S. Moroka	50,370	18.14%

Figure 7 is a map of the zone and Figure 8 shows the location. The Nkangala/Sekhukhune section is served by feeder roads from the R33 between Marble Hall and Modimolle, as well as other feeder roads from the R568 through Siyabuswa and Madubaduba. There is also a railway line that skirts around the northern flank of the section from Marble Hall to Settlers. The Mkhondo section is served by the R543 from Piet Retief to Wakkerstroom or Volksrust. The Pixley ka Seme Section lies close to the N11 between Volksrust and Amersfoort or Ermelo. The Bethel to Volksrust railway also passes through Vlakpoort.

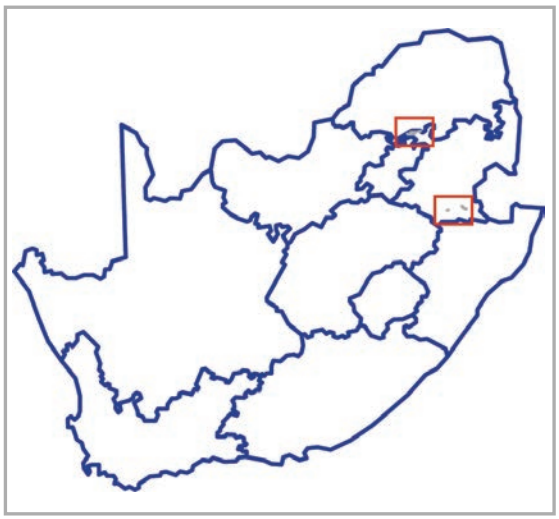


Figure 7: *ZAHIC Livelihood Zone location*

The livelihood zone has been given an alphabetic code (or abbreviation) of 'ZAHIC' and a numeric code of 59303. These codes distinguish the zone both nationally and internationally, while permitting name changes if desired (the code should remain the same).

The zone spans six municipalities in three districts across two provinces. However, only a small portion of the population in each of these six municipalities are included in the zone. The total population in the zone is 145,930 (projected to 2016 from the Census, 2011) and the Limpopo portion is 0.55% of the provincial total, while that of Mpumalanga is 2.61%. Table 6 shows the breakdown for each municipality.

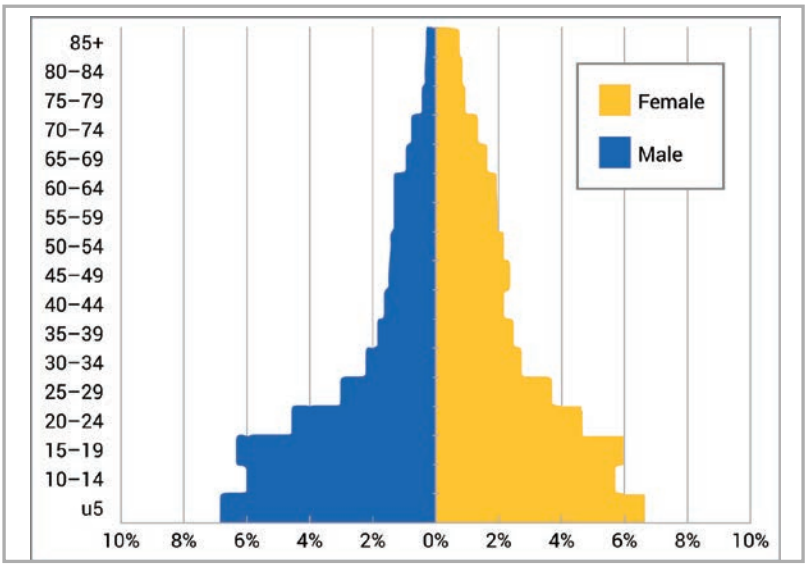


Figure 8: *Gender and age breakdown of ZAHIC Zone population*

Figure 9 shows the age and gender breakdown of the livelihood zone. The lower proportion of adult men in the livelihood zone, as well as the high proportion of children (younger than 20), an unbalanced gender and dependency ratio, is a consequence of apartheid that forced men to seek work in the surrounding commercial farms and the urban, industrial, and mining areas. The persistence of this pattern has impacted productivity through shortages of human capital and reduced labour availability.

4.6.2 Highveld Open Access Mixed Income (ZAHMI) in Nkangala District

The livelihood zone is characterised by variations in relief, climate, and vegetation. It covers the Fertile Areas of Groblersdal, Marble Hall, and the livestock producing areas of Rust De Winter and KwaMhlanga. The undulating grassy plains of the Highveld give way to the lower-lying Bushveld areas and the mountainous terrain dissected by the Olifants River. Soils are fertile; they are heavy greyish and red alluvial duplex soils, well drained and falling in the Hutton form, ranging from a Shorrocks series to a Makhatini series (the clay contents range from 15 to 35%). Rainfall is seasonal, and is distributed mostly in the summer months between November and April, while the winters are generally cool and dry. The Loskop, Arabie, Rust de Winter, and Mkhombo dams are important reservoirs for water in the livelihood zone. The areas within the catchment of the Olifants River have abundant surface and ground water supplies for commercial irrigation, tourism, industrial, and domestic uses.

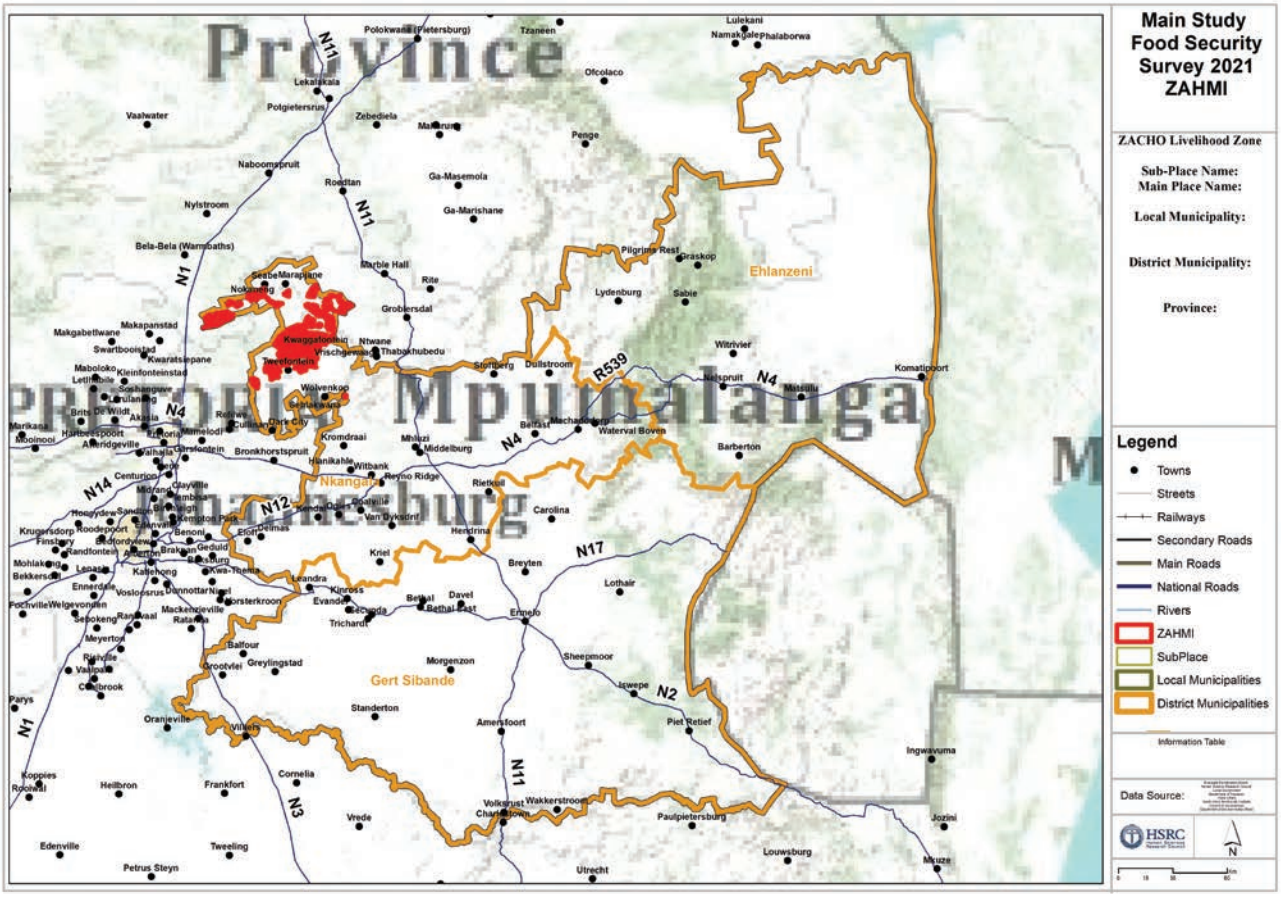


Figure 9a: *Map of ZAHMI Livelihood Zone*

Major roads such as N11, R568, R573, and R25 connect areas in the zone to commercial centres of Marble Hall, Siyabuswa, KwaMhlanga, Bronkhorstspruit, Groblersdal, eMalahleni, and Middelburg. The livelihood zone is only 70-130km away from Pretoria (via the Moloto Road).

Table 7: 2016 Population breakdown of districts and municipalities covered by the livelihood zone, based on the 2011 Census and annual projections

Province	District	Municipality	Pop. Est. in ZAHMI	% of Admin Level
Limpopo	Greater Sekhukhune	Elias Motsoaledi	86,273	31.65%
		Ephraim Mogale	4,244	4.39%
Provincial Total			90,517	1.55%
Mpumalanga	Nkangala	Dr J.S. Moroka	168,180	60.56%
		Thembisile	218,009	63.12%

Figure 9a is a map of the zone and Figure 9b shows the location. The zone spans four municipalities in two districts and two provinces. However, not all of each of the municipalities are included in the zone; substantial areas and populations from each municipality are excluded. The zone population is 90,517 in Limpopo, which is 1.55% of the provincial total, and 386,189 or 8.86% of the provincial total in Mpumalanga (extrapolated from the 2011 Census). Table 7 shows the breakdown for each municipality.

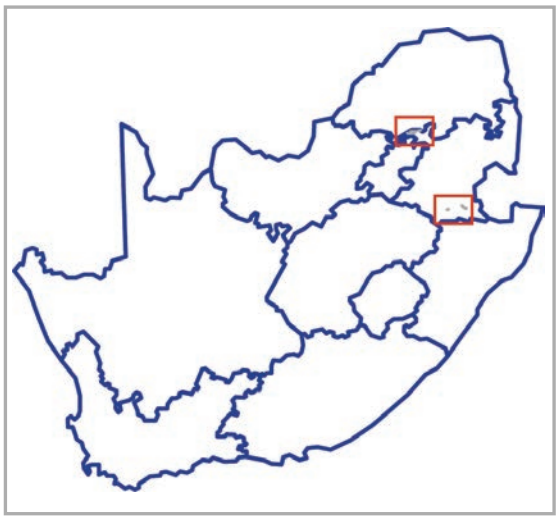


Figure 9b: *ZAHMI Livelihood Zone location*

4.7 Data Management, Weighting and Analysis

4.7.1 Data management

A database reflecting the quantitative survey questionnaire was designed to join 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 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 provinces. 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 2 484 cases, and 3 613 variables were converted to (SPSS) for descriptive analyses and exploration of data quality. Verified and cleaned data were 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 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 needed 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 Mpumalanga Province 2021 mid-year population estimates as 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 1 611 people were interviewed in this province. When weighted, this total represents 3 076 879 South Africans living in Mpumalanga Province of 18 years and older. The final data set (unweighted and weighted) is disaggregated by key demographic variables of household heads.

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
Gert Sibande	477	1 128 417
Nkangala	518	1 121 419
Ehlanzeni	616	827 048
Total	**1 611**	**3 076 879**

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

Gender	Unweighted N	Weighted N
Male	817	1 572 361
Female	794	1 504 518
Total	**1 611**	**3 076 879**

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

Age groups	Unweighted N	Weighted N
18-24	59	532 140
25-34	242	871 331
35-44	311	695 582
45-54	366	435 078
55-64	309	287 442
65-74	200	165 141
75+	120	90 162
No Answer	4	4
Total		**3 076 879**

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], was done to ensure that the estimates of the food and nutrition survey variables were aligned with the general population of Mpumalanga Province. Analyses of weighted data were conducted considering the multi-level sampling design and adjusting for non-responses.

5 Demographics

5.1 Demographics of the Respondents

5.1.1 Characteristics of the household heads and members

Table 11 depicts the characteristics of household heads and members from the households that were realised. More than half (50.7%) of household heads were males. The black African population group accounted for 98.4%, while those between aged 45 and 54 years old constituted 22.8%. In terms of marital status, those who were married or living together accounted for 41.5%. Ehlanzeni recorded the highest percentage with 38.2%, while Gert Sibande accounted for the least proportion with 29.6%. Regarding household the members, majority were children aged 0 to 14 years old, with 31.7%. Three out of four household members were single. Household members followed a similar pattern to household heads at district level.

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

	Household heads			Household members		
	%	95% CI	n	%	95% CI	n
Sex						
Male	50.7	[48.3-53.2]	817	46.8	[45.5-48.0]	3,048
Female	49.3	[46.8-51.7]	794	53.2	[52.0-54.5]	3,471
Total	**100.0**		**1,611**	**100.0**		**6,519**
Population group						
African	98.3	[97.5-98.8]	1,579	98.7	[98.4-98.9]	6,452
White	1.2	[0.8-1.9]	20	0.9	[0.7-1.2]	62
Coloured	0.4	[0.2-0.9]	7	0.3	[0.2-0.5]	20
Indian/Asian	0.1	[0.0-0.4]	1	0.0	[0.0-0.1]	3
Total	**100.0**		**1,607**	**100.0**		**6,537**
Age group						
0-14	-	-	-	31.7	[30.6-32.9]	2,023
18-24 (15-24 for HH members)	3.7	[2.9-4.7]	59	18.5	[17.6-19.5]	1,180
25-34	15.1	[13.4-16.9]	242	16.9	[16.0-17.8]	1,077
35-44	19.4	[17.5-21.4]	311	11.7	[10.9-12.5]	747
45-54	22.8	[20.8-24.9]	366	8.6	[8.0-9.4]	551
55-64	19.2	[17.4-21.2]	309	6.7	[6.1-7.3]	425
65+	19.9	[18.0-21.9]	320	5.9	[5.3-6.5]	375
Total	100.0		1,607	100.0		6,378

	Household heads			Household members		
	%	95% CI	n	%	95% CI	n
Marital status						
Married/Living together	41.5	[39.1-43.9]	656	19.3	[18.3-20.3]	1,245
Divorced/Widowed/Separated	18.7	[16.8-20.7]	295	5.0	[4.5-5.6]	326
Single	39.8	[37.5-42.3]	630	75.7	[74.6-76.7]	4,885
Total	**100.0**		**1,581**	**100.0**		**6,456**
District						
Ehlanzeni	38.2	[35.9-40.6]	616	39.4	[38.2-40.5]	2,580
Gert Sibande	29.6	[27.4-31.9]	477	28.1	[27.0-29.2]	1,841
Nkangala	32.2	[29.9-34.5]	518	32.6	[31.4-33.7]	2,135
Total	**100.0**		**1,611**	**100.0**		**6,556**

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. Table 12 shows the education attainment of the household heads. Secondary school education accounted for 35.1%, followed by those with matric qualification, with 30.1%. The older household heads, those aged 65 years and older and those aged 55 years to 64 years, had higher percentages of no schooling with 47.8% and 23.4%, respectively. Ehlanzeni had the highest percentage of (16.5%) household heads with tertiary education.

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	7.2	[4.7-11.0]	12.9	[9.8-16.8]	35.8	[29.3-42.9]	33.3	[27.7-39.3]	10.8	[7.3-15.6]
Female	12.7	[9.8-16.3]	14.5	[10.5-19.5]	34.4	[27.2-42.5]	27	[21.1-33.9]	11.4	[6.7-18.8]
Total	**10.0**	**[7.7-13.0]**	**13.7**	**[11.3-16.5]**	**35.1**	**[30.2-40.3]**	**30.1**	**[26.1-34.3]**	**11.1**	**[7.6-16.0]**
Age group										
18-24	1.8	[0.2-12.5]	3.5	[1.0-11.3]	53.1	[34.2-71.1]	36.8	[21.0-55.9]	4.9	[1.6-14.1]
25-34	2.1	[0.8-5.2]	4.5	[1.8-10.6]	37.7	[29.7-46.4]	36.1	[29.2-43.6]	19.6	[11.0-32.6]
35-44	4.8	[2.0-11.1]	11.4	[7.1-17.8]	34.7	[26.2-44.3]	39.1	[33.5-44.9]	10.0	[5.8-16.6]
45-54	14.1	[8.6-22.3]	23.4	[17.2-31.1]	32.0	[25.2-39.7]	21.2	[16.2-27.4]	9.2	[5.5-15.0]
55-64	23.4	[16.9-31.5]	36.0	[29.5-43.1]	18.7	[12.3-27.4]	14.1	[9.2-21.2]	7.7	[4.3-13.6]
65+	47.8	[40.7-54.9]	32.5	[27.2-38.3]	12.5	[7.7-19.8]	2.3	[1.2-4.6]	4.9	[2.0-11.4]
Total	**10.0**	**[7.7-13.0]**	**13.7**	**[11.3-16.5]**	**35.1**	**[30.2-40.3]**	**30.1**	**[26.1-34.3]**	**11.1**	**[7.6-16.0]**

	No schooling		Primary		Secondary		Matric		Tertiary	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
District										
Ehlanzeni	6.5	[4.4-9.6]	8.0	[5.7-11.0]	42.6	[31.6-54.3]	26.5	[20.1-34.0]	16.5	[10.4-25.1]
Gert Sibande	9.0	[6.6-12.3]	18.2	[14.2-23.1]	29.3	[22.8-36.8]	35.0	[28.2-42.5]	8.4	[3.9-17.2]
Nkangala	13.6	[8.4-21.2]	13.5	[10.3-17.6]	35.3	[27.7-43.8]	27.8	[21.8-34.6]	9.8	[4.9-18.9]
Total	**10.0**	**[7.7-13.0]**	**13.7**	**[11.3-16.5]**	**35.1**	**[30.2-40.3]**	**30.1**	**[26.1-34.3]**	**11.1**	**[7.6-16.0]**

5.1.3 Education attainment of household members

The results also show the education attainment by the household members aged 7 years and older (Table 13). Secondary school education accounted for 30.9%, followed by those with primary school education with 28.5%. 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 45.2% and 21.7%, respectively. When considering those aged 20 years and older, 11.2% of household members did not have any form of schooling, while 33.6% had matric education.

Table 13: Educational attainment of household members aged 7 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	6.8	[5.2-8.9]	30.0	[27.8-32.2]	31.3	[29.1-33.6]	24.8	[22.7-26.9]	7.1	[5.8-8.8]
Female	8.9	[7.3-10.8]	27.3	[25.7-29.0]	30.6	[28.2-33.2]	24.6	[22.7-26.6]	8.6	[6.8-10.7]
Total	**7.9**	**[6.5-9.7]**	**28.5**	**[27.1-29.9]**	**30.9**	**[29.1-32.9]**	**24.7**	**[23.1-26.3]**	**7.9**	**[6.5-9.6]**
Age group										
7-14	1.4	[0.7-2.6]	86.6	[84.3-88.6]	11.5	[9.5-13.9]	0.5	[0.2-1.1]	0.1	[0.0-0.4]
15-24	1.3	[0.6-2.9]	8.1	[6.6-9.8]	53.8	[50.0-57.5]	31.3	[28.3-34.4]	5.6	[4.1-7.6]
25-34	4.9	[2.6-8.8]	5.0	[3.8-6.6]	31.1	[27.7-34.7]	43.2	[39.4-47.2]	15.8	[12.7-19.5]
35-44	5.2	[3.4-7.8]	8.3	[6.1-11.3]	37.5	[33.3-41.9]	37.3	[33.7-41.0]	11.7	[8.9-15.2]
45-54	10.5	[7.5-14.7]	18.9	[15.2-23.4]	31.6	[27.5-35.9]	28.1	[23.9-32.8]	10.8	[7.7-15.0]
55-64	21.7	[16.8-27.5]	33.6	[28.9-38.6]	22.2	[18.1-26.9]	13.7	[10.1-18.2]	9.0	[5.9-13.5]
65+	45.2	[38.3-52.4]	35.0	[29.8-40.5]	11.4	[8.3-15.5]	5.0	[2.7-9.0]	3.5	[1.8-6.7]
Total	**7.9**	**[6.5-9.7]**	**28.5**	**[27.1-29.9]**	**30.9**	**[29.1-32.9]**	**24.7**	**[23.1-26.3]**	**7.9**	**[6.5-9.6]**
District										
Ehlanzeni	6.8	[4.9-9.3]	27.2	[25.2-29.4]	30.3	[27.1-33.8]	26.5	[24.5-28.5]	9.2	[6.9-12.1]
Gert Sibande	7.0	[5.1-9.6]	31.6	[29.1-34.1]	30.1	[27.1-33.3]	24.3	[20.8-28.2]	7.0	[4.7-10.3]
Nkangala	10.3	[7.4-14.1]	28.3	[25.9-30.9]	32.3	[30.1-34.7]	22.3	[19.8-25.1]	6.7	[4.8-9.4]
Total	**7.9**	**[6.5-9.7]**	**28.5**	**[27.1-29.9]**	**30.9**	**[29.1-32.9]**	**24.7**	**[23.1-26.3]**	**7.9**	**[6.5-9.6]**

5.1.4 Employment status

Table 14 shows that among the household heads and members who were economically active, 56.1% and 70.2%, respectively, were unemployed. A higher proportion (69.5%) of female household heads were unemployed compared to their male counterparts with 42.8%. About 75% of female household members were unemployed, compared to 63.7% males. Among the youth, those aged 34 years and younger, unemployment rate was 62.4% and 81.0% for household heads and members, respectively. With exception of the youth, those aged between 55 and 64 years old had the highest unemployment rate of 65.0% and 69.3% for household heads and members, respectively. The highest unemployment rate (62.1%) among household heads was reported in Nkangala District, followed by Ehlanzeni with 54.2%. For all household members, Nkangala had highest unemployment rate with 74.3%.

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	57.2	[48.5-65.5]	42.8	[34.5-51.5]	36.3	[32.4-40.3]	63.7	[59.7-67.6]
Female	30.5	[24.3-37.6]	69.5	[62.4-75.7]	24.3	[21.6-27.2]	75.7	[72.8-78.4]
Total	**43.9**	**[38.5-49.5]**	**56.1**	**[50.5-61.5]**	**29.8**	**[27.1-32.7]**	**70.2**	**[67.3-72.9]**
Age group								
18-24 (15 -24 for HH Members)	17.1	[8.5-31.2]	82.9	[68.8-91.5]	5.9	[4.3-8.2]	94.1	[91.8-95.7]
25-34	50.0	[41.9-58.2]	50.0	[41.8-58.1]	33.4	[29.5-37.6]	66.6	[62.4-70.5]
35-44	54.5	[48.5-60.4]	45.5	[39.6-51.5]	46.3	[41.9-50.8]	53.7	[49.2-58.1]
45-54	53.5	[44.1-62.6]	46.5	[37.4-55.9]	49.6	[44.3-54.9]	50.4	[45.1-55.7]
55-64	35.0	[26.1-45.1]	65.0	[54.9-73.9]	30.7	[25.5-36.4]	69.3	[63.6-74.5]
Total	**43.9**	**[38.5-49.5]**	**56.1**	**[50.5-61.5]**	**29.8**	**[27.1-32.6]**	**70.2**	**[67.4-72.9]**
District								
Ehlanzeni	45.8	[35.8-56.2]	54.2	[43.8-64.2]	31.5	[26.9-36.5]	68.5	[63.5-73.1]
Gert Sibande	48.2	[41.0-55.5]	51.8	[44.5-59.0]	32.2	[27.4-37.4]	67.8	[62.6-72.6]
Nkangala	37.9	[29.1-47.6]	62.1	[52.4-70.9]	25.7	[22.4-29.4]	74.3	[70.6-77.6]
Total	**43.9**	**[38.5-49.5]**	**56.1**	**[50.5-61.5]**	**29.8**	**[27.1-32.6]**	**70.2**	**[67.4-72.9]**

At local municipality level, the following local municipalities: Chief Albert Luthuli, DR JS Moroka, Mkhondo, Dr Pixley Ka Isaka Seme, and Thembesile fell under the highest band (73.7% to 78.5%) of unemployed household members (Figure 10). Thaba Chweu local municipality was under the lowest band with 46.3% of household members being unemployed.

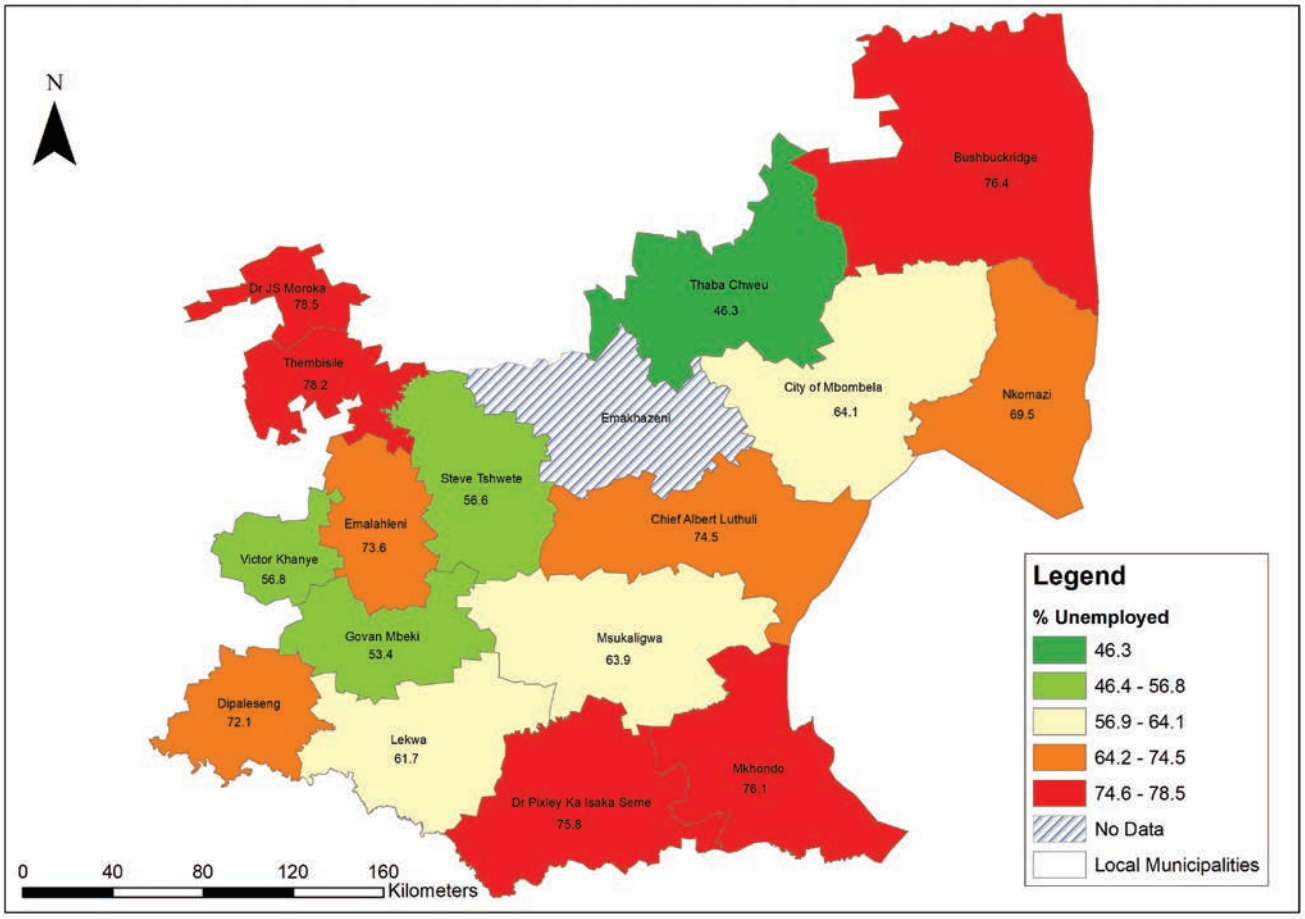


Figure 10: *Employment status of household members by local municipality*

5.1.5 Household income

Table 15 shows household income by household head sex, age, and district. The highest percentage (28.6%) was recorded among households which recorded between R1 501 and R3 000, followed by those that had no income or earned less than R1 500 with 24.0%. Male-headed households had significantly higher percentage (26.9%) household income of more than R6 000 compared to female-headed ones with 15.8%. Households headed by those aged from 45 to 54 years old had the highest percentage of household income of more than R6 000, with 27.3%. Nkangala had the highest percentage of (25.7%) households which had no income or earned less than R1 500. The difference between the three districts across all four income bands was not significant based on the confidence intervals.

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

	No income or <R1500		R1501-R3000		R3001-R4500		R4501-R6000		>R6000	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Sex										
Male	22.9	[19.4-26.8]	22.4	[19.8-25.4]	16.0	[13.3-19.1]	11.8	[10.0-13.9]	26.9	[22.7-31.6]
Female	25.3	[21.5-29.5]	35.1	[31.5-38.8]	15.0	[12.6-17.9]	8.8	[7.1-10.8]	15.8	[11.9-20.8]
Total	**24.0**	**[21.5-26.8]**	**28.6**	**[26.2-31.0]**	**15.5**	**[13.6-17.7]**	**10.3**	**[9.0-11.8]**	**21.5**	**[18.1-25.5]**
Age group										
18-24	56.2	[42.0-69.5]	20.1	[11.6-32.6]	10.2	[4.1-23.3]	9.2	[3.8-20.5]	4.2	[1.1-15.3]
25-34	32.3	[27.0-38.0]	23.8	[18.1-30.5]	11.4	[7.8-16.5]	11.0	[7.4-16.1]	21.5	[16.4-27.6]
35-44	31.6	[25.9-37.9]	20.0	[15.5-25.5]	13.2	[9.8-17.7]	10.3	[7.6-13.7]	24.9	[19.2-31.6]
45-54	22.7	[18.2-28.0]	24.7	[20.5-29.5]	15.8	[11.6-21.1]	9.5	[6.7-13.3]	27.3	[21.6-33.8]
55-64	22.3	[17.7-27.7]	31.1	[25.7-37.0]	14.9	[10.7-20.4]	10.5	[7.2-15.1]	21.3	[16.0-27.7]
65+	8.2	[5.6-11.9]	44.0	[38.6-49.6]	22.2	[16.9-28.6]	10.6	[7.9-14.0]	15.0	[11.2-19.9]
Total	**24.1**	**[21.5-26.9]**	**28.5**	**[26.2-31.0]**	**15.6**	**[13.6-17.8]**	**10.3**	**[9.0-11.7]**	**21.6**	**[18.1-25.5]**
District										
Ehlanzeni	23.6	[20.0-27.6]	26.8	[23.6-30.2]	16.0	[12.9-19.7]	11.2	[9.3-13.3]	22.5	[16.9-29.2]
Gert Sibande	22.7	[17.4-29.2]	30.2	[25.3-35.7]	15.9	[13.1-19.2]	9.2	[6.8-12.2]	21.9	[15.1-30.8]
Nkangala	25.7	[21.2-30.7]	30.1	[25.9-34.6]	14.5	[11.2-18.6]	9.9	[7.7-12.7]	19.8	[15.3-25.3]
Total	**24.0**	**[21.5-26.8]**	**28.6**	**[26.2-31.0]**	**15.5**	**[13.6-17.7]**	**10.3**	**[9.0-11.8]**	**21.5**	**[18.1-25.5]**

5.1.6 Sources of income

Table 16 shows that the majority of (32.4%) household heads relied on salaries and wages as their source of income, while the majority (39.9%) of household members relied on social welfare grants (including old age grant) as their source of income. About 30% of household heads reported social welfare grants (including old age grant) as their source of income.

Table 16: Sources of income of household heads and members

	Household heads	Household members
Source of income	%	%
Salaries and wages	32.4	14.6
Social welfare grants (including old age grant)	30.1	39.9
Net profit from business or professional practice/activities or commercial farming	5.6	2.3
Other	3.7	2.3
Regular allowances/remittances received from non- Household members	3.5	0.4
Income from share trading	1.6	0.0
Regular receipts from pension from previous employment and pension from annuity funds	1.4	0.6
Alimony, maintenance, and similar allowances from divorced spouse, family members, etc., living elsewhere	1.2	0.5
Income from small-scale farming	1.0	0.5
Income from letting of fixed property	0.5	0.1
Dividends on shares (e.g., unit trusts)	0.2	0.1
Royalties	0.0	0.0
Interest received and/or accrued on deposits, loans, savings certificates	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. Significantly more female household heads (45.7%) relied on social welfare grants as source of income compared to their male counterparts, with only 13.7% reporting social welfare grants as their source of income. A similar scenario is noticed at household members' level as there were significantly more females (45.5%) who relied on social welfare grants as source of income compared to their male counterparts with only 33.5%. Nkangala had the highest proportion of 30.3% household heads and 40.4% household members who relied on social welfare grants as their source of income. It is worth noting though that the differences between the three districts were not significant based on confidence intervals.

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 source of income			Household members who had social welfare grants as source of income		
Variable	**%**	**95% CI**	**n**	**%**	**95% CI**	**N**
Sex						
Male	13.7	[10.8-17.2]	804	33.5	[30.0-37.1]	3,013
Female	45.7	[36.1-55.6]	777	45.5	[42.4-48.6]	3,441
Total	**30.1**	**[24.5-36.3]**	**1,581**	**39.9**	**[37.0-42.8]**	**6,454**
Age group						
0-14	-	-	-	51.9	[46.8-57.0]	2,010
18-24 (15 -24 for HH Members)	16.1	[6.5-34.6]	55	30.2	[26.8-33.9]	1,173
25-34	20.9	[14.1-29.8]	232	26.1	[22.7-29.8]	1,073
35-44	28.0	[19.4-38.6]	304	27.3	[23.3-31.7]	739
45-54	22.7	[16.9-29.7]	362	25.3	[21.4-29.6]	547
55-64	47.4	[39.1-55.8]	306	46.6	[40.9-52.5]	423
65+	89.3	[80.8-94.3]	320	89.3	[84.8-92.5]	375
Total	**30.1**	**[24.5-36.3]**	**1,579**	**40.2**	**[37.3-43.1]**	**6,340**
District						
Ehlanzeni	29.8	[22.0-39.0]	611	40.2	[36.1-44.5]	2,560
Gert Sibande	30.1	[20.3-42.1]	468	38.5	[31.5-45.9]	1,821
Nkangala	30.3	[21.3-41.0]	502	40.4	[36.1-44.8]	2,097
Total	**30.1**	**[24.5-36.3]**	**1,581**	**39.9**	**[37.1-42.8]**	**6,478**

Figure 10a shows that Dipaleseng and Dr Pixley Ka Isaka Seme local municipalities fell under the highest band (50.0% to 61.5%) of household members who had social welfare grants as source of income. Chief Albert Luthuli, Govan Mbeki, and Thaba Chweu local municipalities recorded least percentages of household members who had social welfare grants as source of income, as they were under the least band of 18.0% to 27.7%.

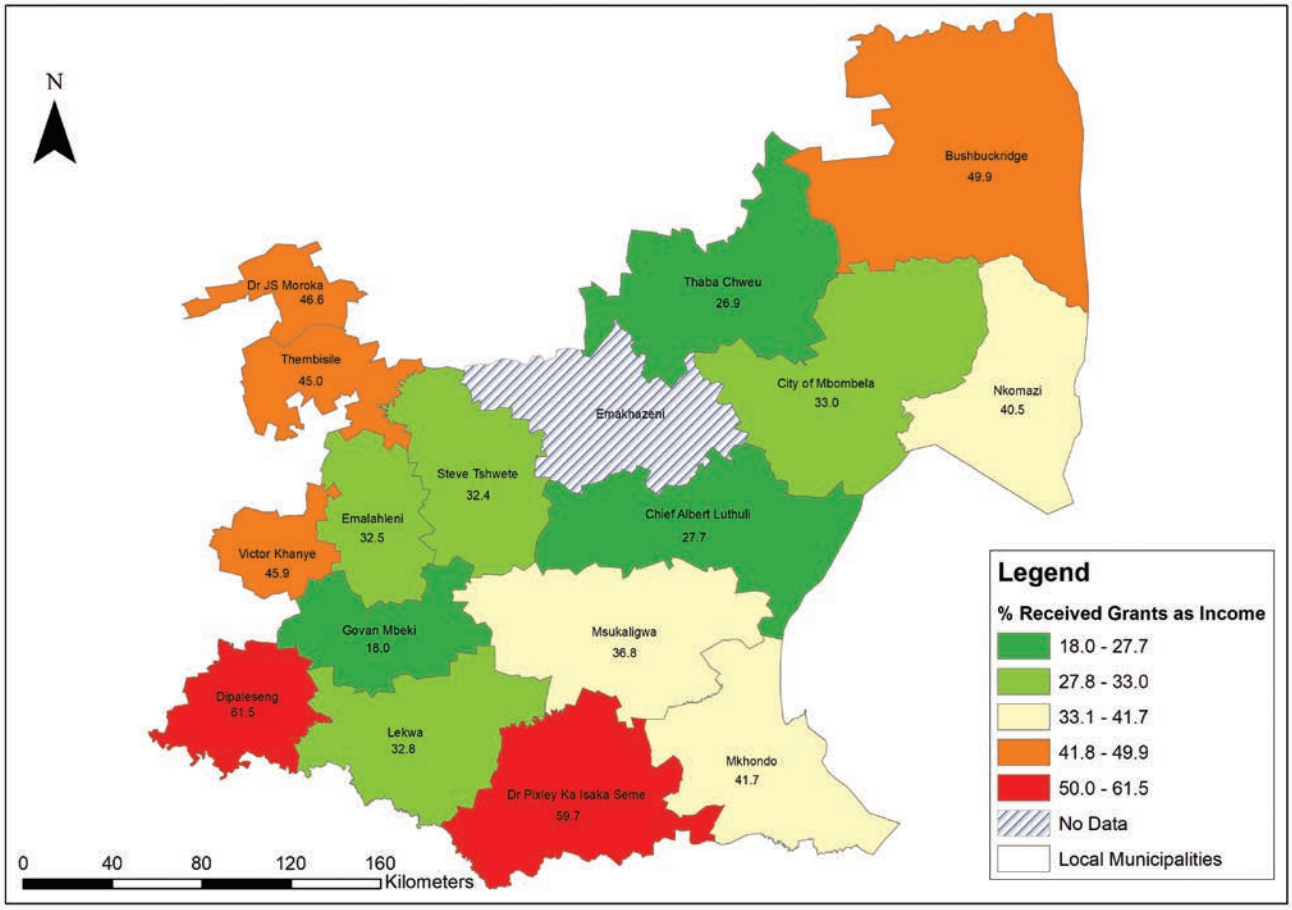


Figure 10a: *Social welfare grants as source of income of household members by local municipality*

Table 18 shows household heads and members who reported receiving any social grant(s) during 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. Majority (91.3%) of elderly household members received social grants in the last 12 months prior to the survey. Just above half (52.9%) of children aged 14 and younger received social grants in a year preceding the survey; this might indicate dominance of child grant. Ehlanzeni had the highest percentage (32.6%) of household heads, while Nkangala had highest percentage (42.3%) of household members who had received social grants during 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		
Variable	**%**	**95% CI**	**n**	**%**	**95% CI**	**n**
Sex						
Male	16.8	[13.3-20.9]	799	34.7	[31.4-38.1]	2,994
Female	47.6	[39.1-56.2]	770	47.4	[44.4-50.5]	3,422
Total	**32.5**	**[27.0-38.5]**	**1,569**	**41.5**	**[38.7-44.3]**	**6,416**
Age group						
0-14	-	-	-	52.9	[47.8-57.9]	1,991
18-24 (15 -24 for HH Members)	21.9	[10.0-41.5]	55	33.4	[29.8-37.1]	1,172
25-34	23.3	[16.0-32.6]	230	27.4	[24.2-30.8]	1,063
35-44	30.0	[21.2-40.6]	303	29.1	[25.2-33.4]	736
45-54	23.8	[18.0-30.8]	358	26.6	[22.4-31.3]	544
55-64	50.4	[41.8-59.0]	305	48.3	[42.8-53.9]	420
65+	87.7	[78.3-93.3]	316	91.3	[86.9-94.4]	371
Total	**32.5**	**[27.0-38.5]**	**1,567**	**41.8**	**[39.0-44.7]**	**6,297**
District						
Ehlanzeni	32.6	[24.3-42.0]	597	40.9	[36.9-45.0]	2,528
Gert Sibande	32.5	[22.7-44.2]	470	40.9	[33.9-48.2]	1,831
Nkangala	32.4	[23.7-42.5]	502	42.3	[38.0-46.7]	2,112
Total	**32.5**	**[27.0-38.5]**	**1,569**	**41.3**	**[38.6-44.2]**	**6,471**

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

In terms of grant type, child support grant constituted 40.0% and 63.1% for household heads and members, respectively (Table 19). The second dominant grant type was old age grant which accounted for 32.4% for household heads and 17.7% for household members. Social relief distress recorded 30.0% and 16.0% for household heads and members, respectively.

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

Grant type	Household heads (%)	Household members (%)
Child support	40.0	63.1
Old age	32.4	17.7
Social relief distress	30.0	16.0
Disability	4.8	3.4
Foster care	1.3	1.0
Care dependency	0.2	0.3
Grant-in-aid	0.1	0.2
War veterans	0.0	0.0

Table 20 shows household heads and members who reported receiving social relief during 12 months prior to the survey. About one out of five household heads reported receiving social relief during 12 months prior to the survey, while only 16.6% of household members were reported to have received social relief. Those aged 18 to 24 years old had the highest proportion (23.8%) of household heads who received social relief during 12 months prior to the survey, while household members aged 25 to 34 years old had the highest proportion (22.3%). Gert Sibande had the lowest percentage (16.0%) of household heads who received social relief during a year prior to the survey, which was lower than a provincial average of 19.0%.

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	14.0	[10.3-18.8]	807	15.8	[13.4-18.5]	3,020
Female	23.7	[17.2-31.7]	776	17.3	[14.9-19.8]	3,443
Total	**19.0**	**[14.5-24.3]**	**1,583**	**16.6**	**[14.5-18.9]**	**6,463**
Age group						
0-14	-	-	-	9.4	[6.7-13.0]	2,001
18-24 (15 -24 for HH Members)	23.8	[13.2-39.2]	55	20.2	[17.7-23.0]	1,173
25-34	17.8	[10.3-29.1]	233	22.3	[18.8-26.3]	1,077
35-44	17.3	[12.3-23.9]	306	18.3	[14.7-22.7]	743
45-54	18	[13.3-23.9]	362	19.9	[16.1-24.4]	550
55-64	19.5	[12.2-29.8]	308	16.9	[13.0-21.7]	424
65+	18.1	[11.1-28.3]	317	16.7	[11.2-24.3]	372
Total	**19.0**	**[14.5-24.3]**	**1,581**	**16.5**	**[14.4-18.8]**	**6,340**

	Household heads received social relief a year prior survey			Household members received social relief a year prior survey		
	%	95% CI	n	%	95% CI	n
District						
Ehlanzeni	19.7	[12.1-30.4]	612	17.2	[13.9-21.2]	2,575
Gert Sibande	16.0	[9.1-26.6]	469	15.4	[12.1-19.3]	1,826
Nkangala	21.3	[16.0-27.9]	502	16.3	[13.1-20.1]	2,100
Total	**19.0**	**[14.5-24.3]**	**1,583**	**16.5**	**[14.5-18.9]**	**6,501**

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

Figure 10b shows that Govan Mbeki and Thaba Chweu local municipalities were under the lowest band (4.9% to 6.4%) of household members who received social relief during the year preceding the survey. Chief Albert Luthuli and Bushbuckridge local municipalities fell under the highest band of 20.3% to 25.6%.

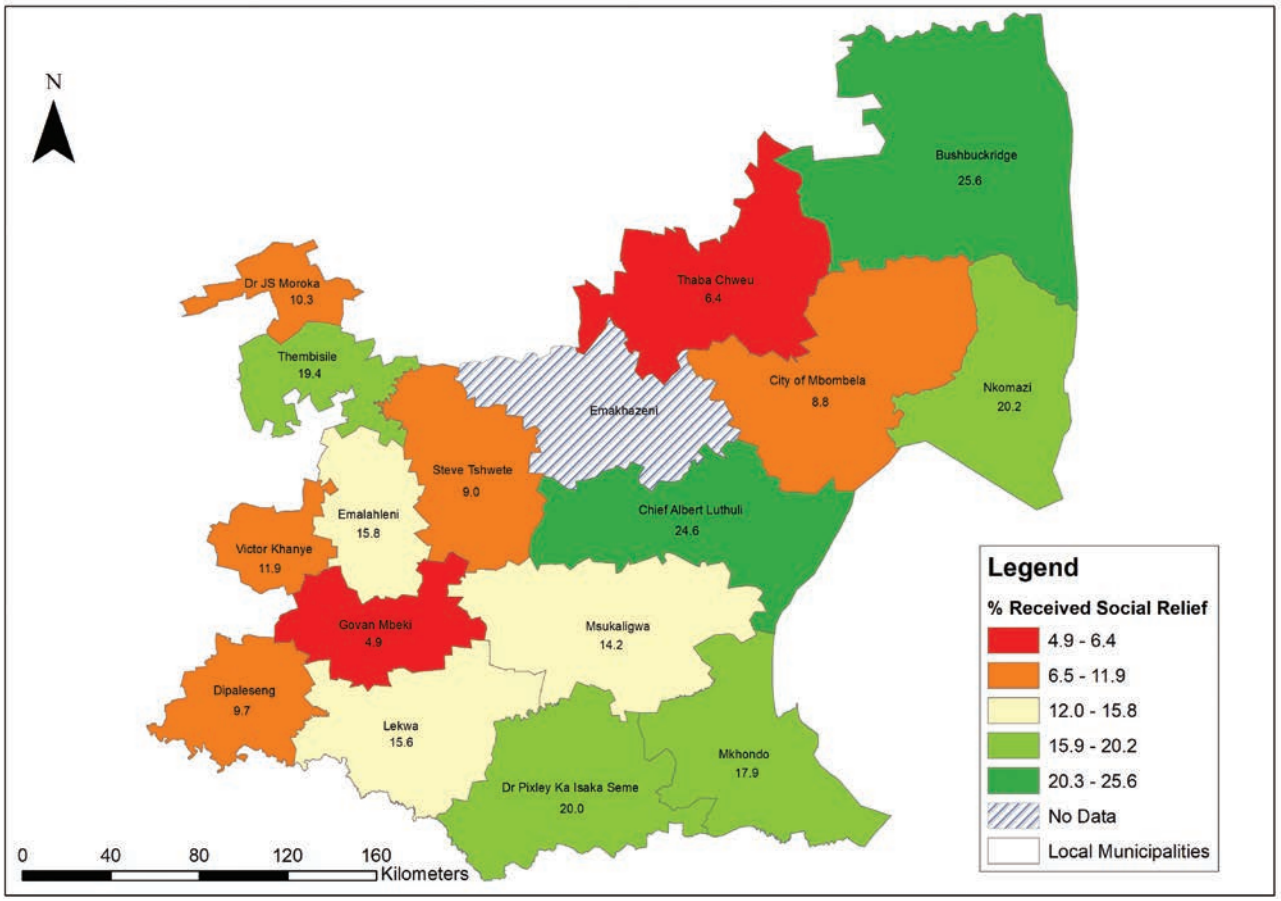


Figure 10b: *Household members who received any social relief during 12 months prior to survey by local municipality*

Most people received cash as social relief with household heads and members accounting for 59.6% and 58.9%, respectively (Table 21). The COVID-19 social relief grant was also received by 56.1% of household heads and 58.3% of household members. Food accounted for around 3% for both household heads and members.

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

Social Relief Type	Household heads (%)	Household members (%)
Cash	59.6	58.9
COVID-19	56.1	58.3
Food	3.4	3.8
Other	0.0	0.1
Blankets	0.0	0.3
Clothes	0.0	0.0

Further breakdown of the COVID-19 grant received by household members indicates that 53.0% of the female members received this social relief compared to 50.9% of their male counterparts (Table 22). Those aged 35 to 44 years old had the highest proportion with 63.7%, followed by those aged 15 to 24 years old with 57.7%. Gert Sibande had the highest percentage (65.4%) of household members who received the COVID-19 social relief grant during 12 months prior to the survey. Ehlanzeni had the lowest proportion of household members who received the COVID-19 social relief grant, with 44.1%.

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

	Yes		No		Total
Variable	**%**	**95% CI**	**%**	**95% CI**	**n**
Sex					
Male	50.9	[40.9-60.9]	49.1	[39.1-59.1]	480
Female	53.0	[43.6-62.1]	47.0	[37.9-56.4]	613
Total	**52.1**	**[42.8-61.2]**	**47.9**	**[38.8-57.2]**	**1,093**
Age group					
0-14	32.9	[18.3-51.8]	67.1	[48.2-81.7]	180
15-24	57.7	[46.7-68.0]	42.3	[32.0-53.3]	242
25-34	56.1	[47.2-64.6]	43.9	[35.4-52.8]	245
35-44	63.7	[52.4-73.6]	36.3	[26.4-47.6]	141
45-54	54.2	[43.8-64.3]	45.8	[35.7-56.2]	113
55-64	49.8	[37.1-62.5]	50.2	[37.5-62.9]	77
65+	40.1	[21.9-61.4]	59.9	[38.6-78.1]	67
Total	**51.8**	**[42.5-60.9]**	**48.2**	**[39.1-57.5]**	**1,065**

	Yes		No		Total
Variable	**%**	**95% CI**	**%**	**95% CI**	**n**
District					
Ehlanzeni	44.1	[30.8-58.2]	55.9	[41.8-69.2]	457
Gert Sibande	65.4	[47.5-79.8]	34.6	[20.2-52.5]	277
Nkangala	55.9	[43.4-67.7]	44.1	[32.3-56.6]	363
Total	**52.0**	**[42.8-61.1]**	**48.0**	**[38.9-57.2]**	**1,097**

5.1.7 Discussion

It is always important to give context of the demographic characteristics of the current study population in relation to other recent nationally representative surveys. There were slightly fewer people with no schooling education (7.9%) compared to the 2016 survey which had 12.6% (SADHS, 2016). On the other end, there were slightly more people with tertiary education with 7.9% in the current study compared to 6.1% in the 2016 survey. For those aged 20 years and older, 11.2% of household members did not have any form of schooling compared to 5.1% in 2020, while 33.6% had matric education compared to 32.7% in 2020 (Stats SA, 2021).

The unemployment rate for household heads and members who were economically active from the current study was 56.1% and 70.2%, which is higher than the provincial official unemployment rate from the third quarter of the Quarterly Labour Force Survey in 2021 which was 37.5% (QLFS, 2021). This is probably because the survey was also able to capture people who are unemployed but not actively looking for work.

As was the case in 2020 General Household Survey where social grants were the second most important source of income for households after salaries nationally (Stats SA, 2021), the majority of (32.4%) household heads relied on salaries and wages, followed by 30.0% who relied on social grants. Furthermore, the majority of (39.9%) household members relied on social welfare grants (including old age grant) as their source of income. The provincial average of 41.5% of household members reported receiving social grant is in line with the Mpumalanga average for household population of 38.0% and 41.7% in 2016 and 2020, respectively (SADHS, 2016; Stats SA, 2021). In terms of grant type, the child support grant was the most common type of grant with 40.0% and 63.1% for household heads and members, respectively. Although this was also the case in 2016, the percentage of the household population that received child grant in this province was lower, with 29.8% (SADHS, 2016). Unsurprisingly, children and the elderly were more likely than other age groups to receive any type of grants. In terms of the COVID-19 grant, 58.3% of household members were reported as having received this grant in Mpumalanga in 2021. This is higher than the provincial average of 9.6% 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

Table 23 shows dwelling types occupied by the households in Mpumalanga. The findings emanating from thisr study show that the most common dwelling types inhabited by households in Mpumalanga Province were formal dwellings, described as brick/concrete block structures on a separate stand on a farm or yard (85.1%). The second most common dwelling types were informal dwelling/shacks not in a backyard, e.g., on an informal/squatter settlement or a farm. Only 0.9% of the households reported living in traditional dwellings.

Table 23: Types of dwellings occupied by households

Dwelling type (n=1559)	Number (n)	Percentage (%)
Formal dwelling/ House or brick/concrete block structure on a separate stand or yard or on a farm	1,309	85.1
Informal dwelling/Shack not in backyard	86	4.8
Formal dwelling /House/ Flat/Room in backyard	62	3.9
Informal dwelling/Shack in backyard	59	3.4
Room/Apartment on a property or an apartment in a larger dwelling, servants quarters/granny	23	1.5
Traditional dwelling/Hut/Structure made of traditional materials	15	0.9
Semi-detached house	2	0.2
Town house (semi-detached house in a complex)	1	0.1
Flat or apartment in a block of flats	1	0.1
Caravan/Tent	1	0.1

5.3 Access to Water Service

5.3.1 Households main source of drinking water

Table 24 shows that tap in the yard was the leading source of drinking water (47.4%) in Mpumalanga Province. Only 21.4% of households had access to tap water inside the dwellings. The third most common source of drinking water was public/communal taps (7.7%). About four per cent of the households indicated that their main source of drinking water was a borehole in their yard. Rainwater tank was the main source of drinking water for less than 1% of the households.

Table 24: Main source of drinking water

Main source of drinking water (n= 1585)	Number (n)	Percentage (%)
Piped (tap) water in yard	781	47.4
Piped (tap) water in dwelling/house	329	21.4
Public/communal tap	121	7.7
Water-carrier/tanker	81	5.7
Neighbour's tap	67	4.2
Borehole in yard	62	4.1
Borehole outside yard	45	2.9
Other	41	2.8
Water vendor (charge involved)	31	2.2
Rainwater tank in yard	12	0.8
Flowing water/stream/river	8	0.6
Spring	3	0.2
Well	3	0.2
Stagnant water/dam/pool	1	0.1

Table 25 shows that access to tap water in dwellings was higher in male-headed households (22.8%). Female- headed (51.2%) households had the highest proportion of households relying on tap water in the yard. Ehlanzeni District had the highest proportion of households with access to tap water in the dwelling (30.9%), and Gert Sibande had the least (12.2%). With regards to piped water in the yard, Gert Sibande takes the lead (57.7%), followed by Ehlanzeni (55.8%) (Table 25). Nkangala leads with the proportion of the households using public/ communal taps as the main source of the drinking water source. Water carriers/tanker were primarily used in the Nkangala District (8.7 %) (Table 25).

Table 25: Households main source of water by sex of household head and districts

		Household head sex		Districts		
		Male	Female	Ehlanzeni	Gert Sibande	Nkangala
Piped (tap) water in dwelling/house	%	22.8	19.9	30.9	12.2	23.1
	95% CI	[17.2-29.5]	[14.9-26.1]	[23.5-39.5]	[7.0-20.5]	[15.3-33.2]
Piped (tap) water in yard	%	43.6	51.2	55.8	57.7	36
	95% CI	[35.7-51.9]	[43.2-59.1]	[47.8-63.5]	[42.6-71.5]	[26.0-47.3]
Borehole in yard	%	5.1	3.1	1	6.6	3.9
	95% CI	[2.6-9.6]	[1.7-5.8]	[0.3-3.8]	[2.4-17.2]	[2.0-7.3]
Rainwater tank in yard	%	0.3	1.2	0.3	1.5	0.5
	95% CI	[0.1-1.1]	[0.5-2.9]	[0.1-1.3]	[0.4-4.9]	[0.2-1.5]
Neighbour's tap	%	4.7	3.6	3.5	3.5	5
	95% CI	[3.1-7.1]	[2.2-5.9]	[2.0-6.1]	[1.9-6.2]	[2.7-9.0]
Public/communal tap	%	7.7	7.7	4.1	6.4	10.3
	95% CI	[4.9-11.7]	[4.4-13.3]	[1.6-10.0]	[3.1-12.9]	[5.2-19.4]
Water-carrier/tanker	%	6.1	5.2	2.1	3.8	8.7
	95% CI	[3.3-10.9]	[2.9-9.1]	[0.8-5.7]	[1.4-10.0]	[4.3-16.7]
Water vendor (charge involved)	%	2	2.3	0.7	1.6	3.4
	95% CI	[0.8-4.7]	[0.9-5.6]	[0.2-2.6]	[0.6-4.4]	[1.2-9.1]
Borehole outside yard	%	3	2.8	0.9	3.9	3.2
	95% CI	[1.4-6.4]	[1.5-5.2]	[0.2-4.1]	[1.4-10.5]	[1.6-6.3]
Flowing water/stream/ river	%	1.1	0	0	0.9	0.6
	95% CI	[0.3-3.6]			[0.1-5.9]	[0.1-2.6]
Stagnant water/dam/ pool	%	0	0.1	0	0	0.2
	95% CI		[0.0-1.0]			[0.0-1.1]
Well	%	0.3	0.1	0.2	0.2	0.1
	95% CI	[0.1-1.0]	[0.0-0.6]	[0.0-1.2]	[0.0-1.4]	[0.0-1.0]
Spring	%	0.3	0.1	0	0	0.5
	95% CI	[0.1-1.2]	[0.0-1.0]			[0.1-2.0]
Other	%	3.1	2.5	0.5	1.7	4.7
	95% CI	[1.5-6.3]	[1.5-4.3]	[0.2-1.5]	[0.6-4.8]	[2.5-8.7]
Total (n)		**807**	**774**	**470**	**502**	**613**

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

Based on the WHO & UNICEF Joint Monitoring Programme (JMP) definition, water sources were categorised into 'improved' and 'unimproved' water sources. Improved drinking water sources include piped water (in dwelling and yard or plot), public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, and rainwater collection Ref (WHO and UNICEF, 2017). Findings from this study indicate that majority of the households (96.1%) had access to improved water sources. Nkangala (99%) and Gert Sibande (99%) had the highest proportion of households with improved water sources (Figure 11).

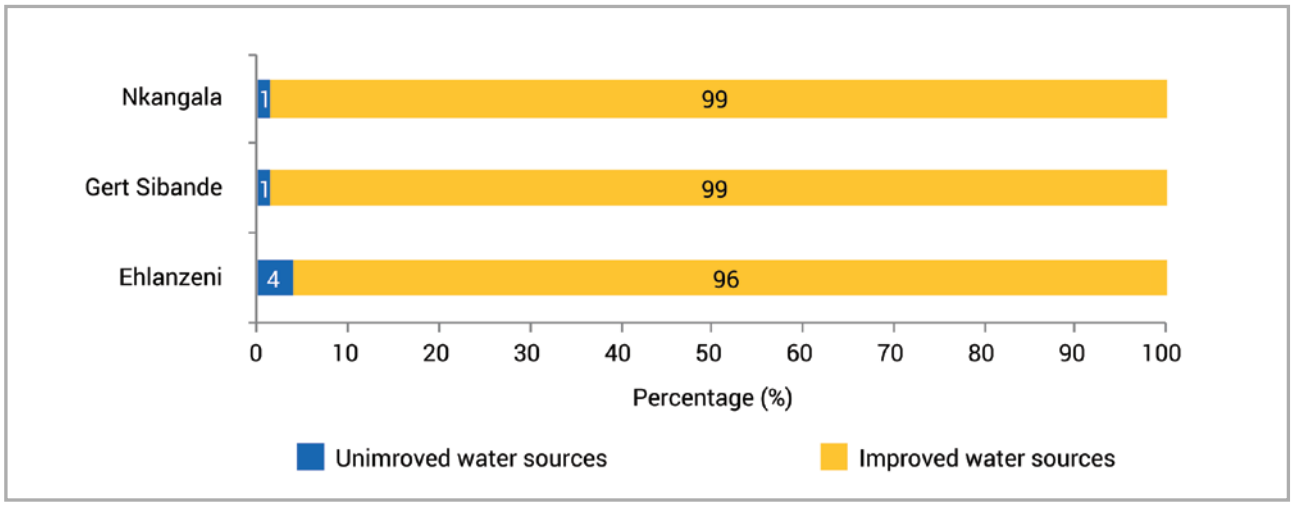


Figure 11: *Improved and unimproved water sources by district*

For the majority of the households in Mpumalanga Province, the main source of drinking water was supplied by the municipality (77.2%) (Figure 12). Only 2.4% of the households did not know the water supplier.

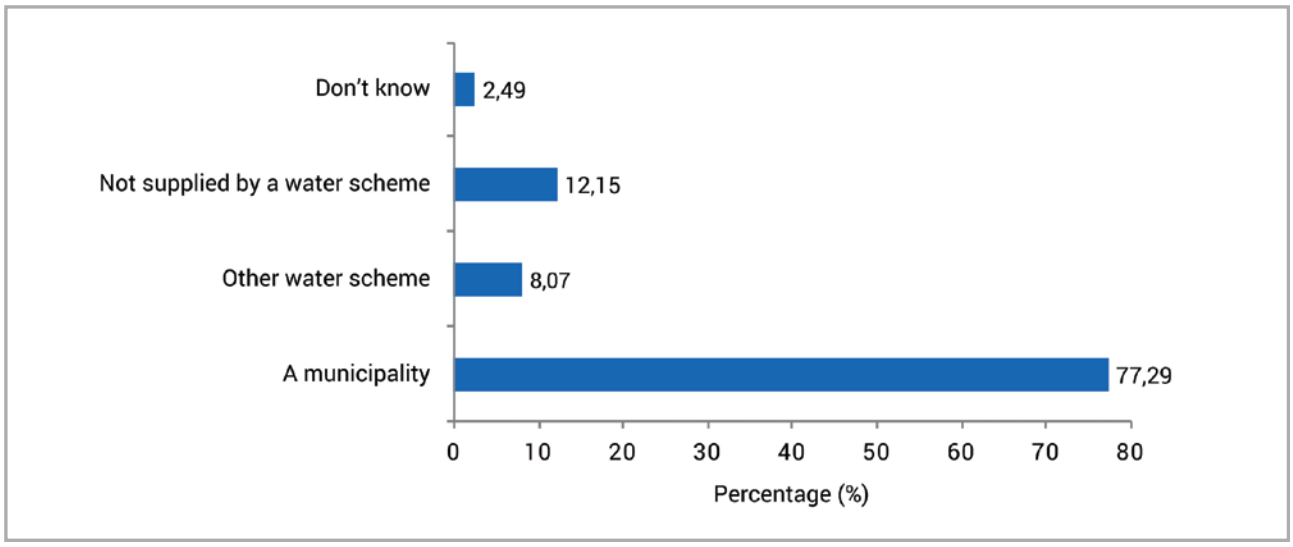


Figure 12: *Water supplier (n=1537)*

5.3.2 Payment for water services

When asked if the household pays for water, the majority (71.1%) of the households responded 'no', while 28.9 said 'yes' (Figure 13). Ehlanzeni District (52.9%) had the highest proportion of households paying for water services, while Gert Sibande had the lowest (21.2%) (Figure 14).

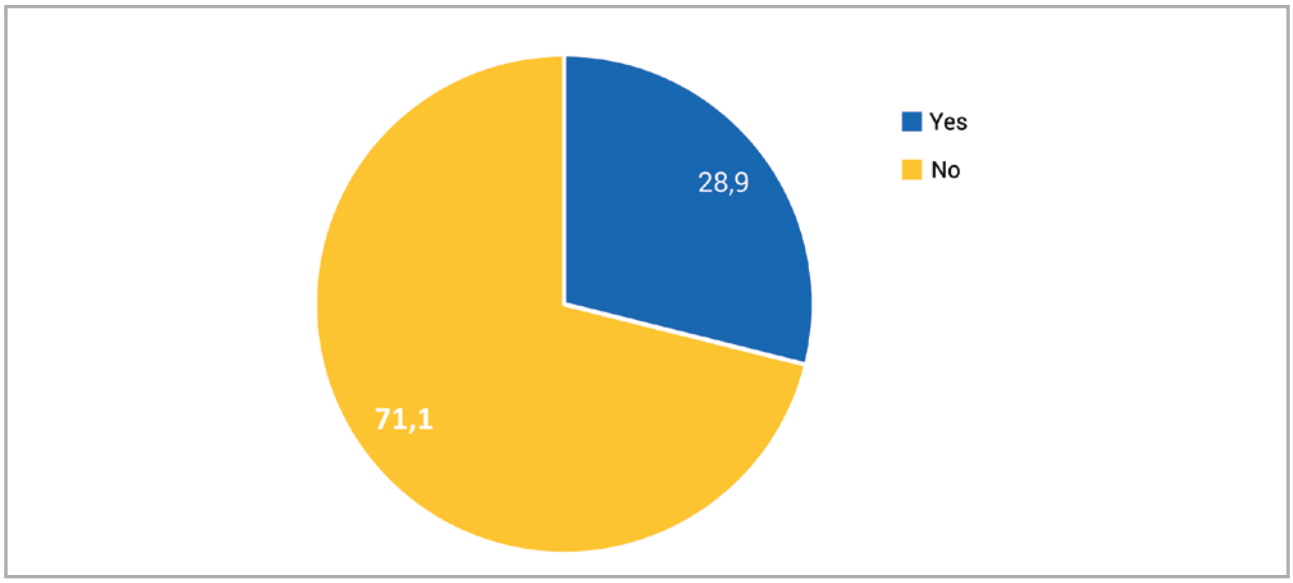


Figure 13: *Payment of water sources (n=1 535)*

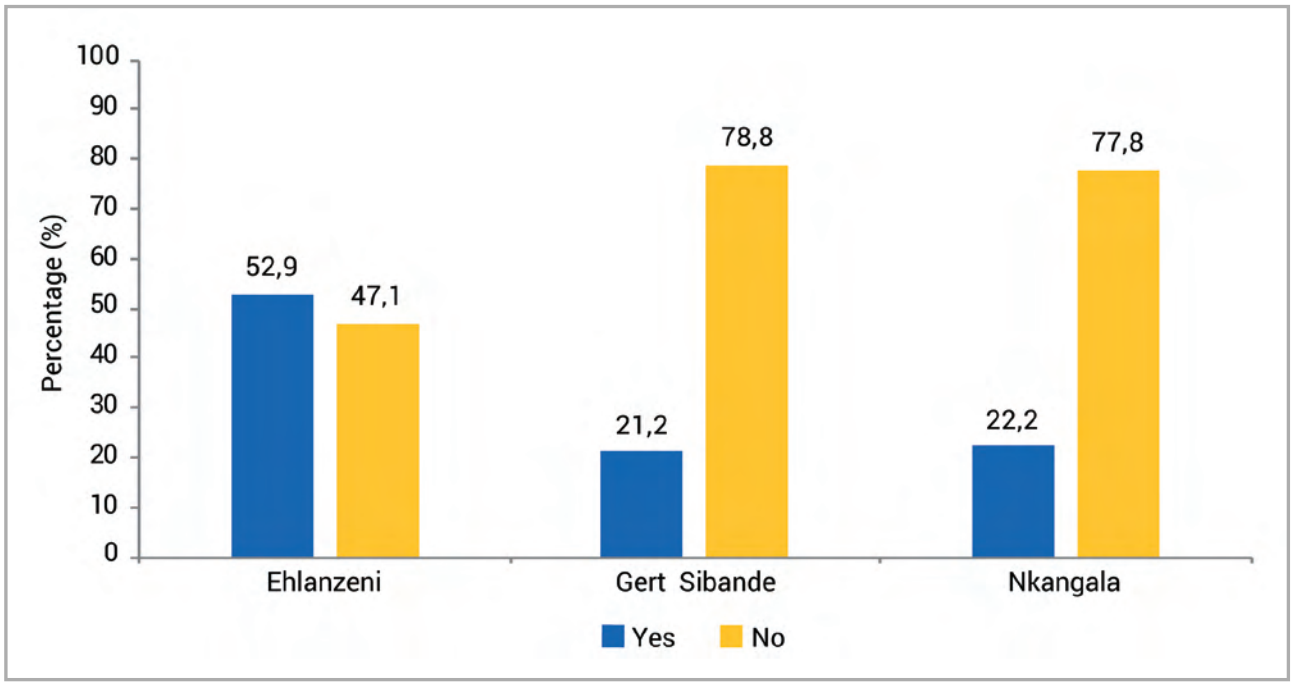


Figure 14: *Payment of water services by district*

5.4 Sanitation and Hygiene

The most common toilet facility used by the households was a pit latrine/toilet without a ventilation pipe (44.1%) (Table 26). Pit latrine/toilet with ventilation pipes were used by 18.5% of the households. Around 5.8% of the households used flush toilets connected to a septic or conservancy tank. Only 28.9% of the households used a flush toilet connected to public sewerage systems (Table 26). The majority (75.5%) of the households using a flush toilet connected to a public sewerage system did not pay for sanitation services (Figure 15).

Table 26: Type of toilet facility used by households

Type of toilet facility (n=1 559)	Number (n)	Percentage (%)
Pit latrine/toilet without ventilation pipe	647	44.1
Flush toilet connected to a sewerage system	500	28.9
Pit latrine/toilet with ventilation pipe	278	18.5
Flush toilet connected to a septic or conservancy tank	89	5.8
Pour flush toilet connected to a septic tank (or septage pit)	19	1.3
Open defecation	15	0.7
Other	7	0.5
Bucket toilet (emptied by household)	3	0.2

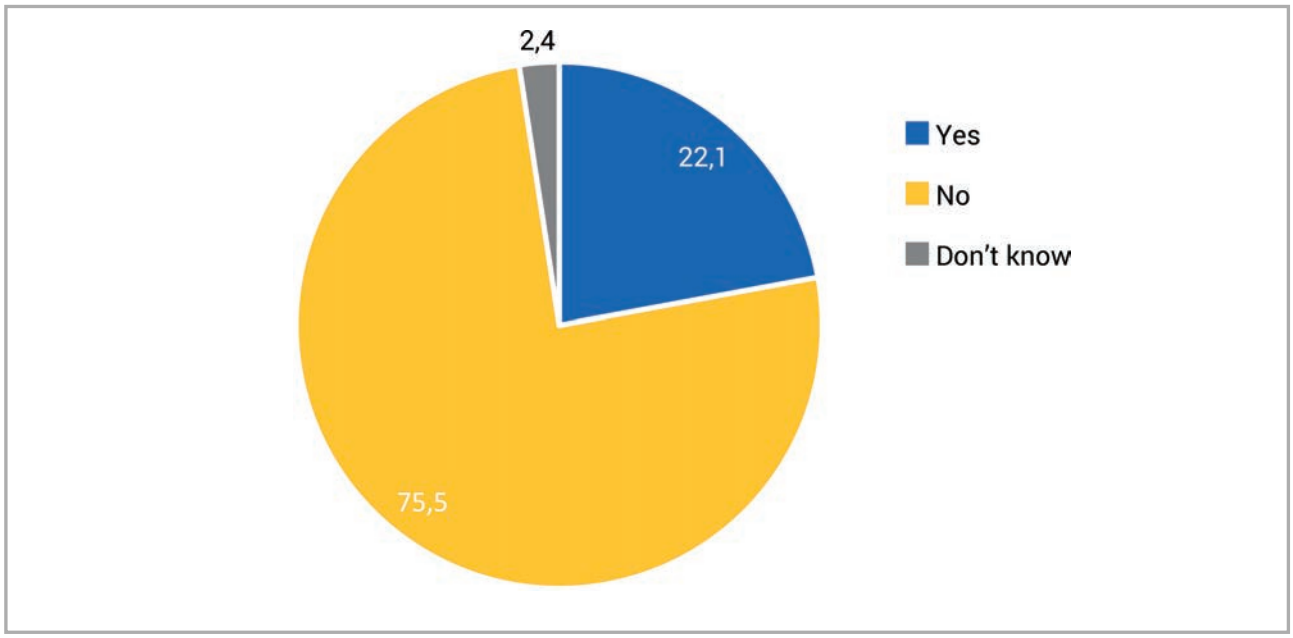


Figure 15: *Proportion of households paying for public sewerage (n=1230)*

The result shows no significant relationship between the sex of the household head and the type of toilet facility used by the household (Table 27). Ehlanzeni had the highest proportion of households using flush toilets connected to the public sewerage system (64.5%), while Nkangala had the least (15.8%). Gert Sibande (52.1%) and Nkangala (52.4%) districts had the highest proportion of households using pit latrines/toilets without ventilation pipes (Table 27). The highest proportion of households using pit latrines /toilets with ventilation pipes was in Nkangala (23.2%). Regarding flush toilets connected to a septic or conservancy tank, Ehlanzeni takes the lead (6.8%).

Table 27: Type of toilet facility used by the households by sex of the household head and district

		Household head sex		Districts		
		Male	Female	Ehlanzeni	Gert Sibande	Nkangala
Flush toilet connected to a public sewerage system	%	27.9	30	64.5	22.5	15.8
	95% CI	[20.0-37.5]	[21.2-40.5]	[47.3-78.5]	[11.4-39.5]	[7.8-29.4]
Flush toilet connected to a septic or conservancy tank	%	6	5.7	6.8	5	5.9
	95% CI	[4.2-8.4]	[3.6-8.8]	[3.6-12.4]	[3.4-7.4]	[3.3-10.3]
Pour flush toilet connected to a septic tank (or septage pit)	%	1.2	1.4	0.6	1.1	1.8
	95% CI	[0.6-2.5]	[0.6-2.9]	[0.1-2.4]	[0.4-2.8]	[0.9-3.4]
Chemical toilet	%	0	0.1	0.2	0	0
	95% CI		[0.0-0.6]	[0.0-1.3]		
Pit latrine/toilet with ventilation pipe	%	20	16.8	9	18.4	23.2
	95% CI	[15.3-25.6]	[12.9-21.7]	[4.1-18.8]	[11.9-27.3]	[17.4-30.2]
Pit latrine/toilet without ventilation pipe	%	43.3	45	16.3	52.1	52.4
	95% CI	[36.2-50.7]	[37.1-53.1]	[9.0-27.6]	[40.6-63.3]	[42.6-61.9]
Bucket toilet (emptied by household)	%	0.2	0.3	0.2	0	0.3
	95% CI	[0.0-1.1]	[0.1-1.1]	[0.0-1.4]		[0.1-1.3]
Open defecation (e.g., no facilities, field, bush)	%	0.8	0.5	2.1	0.4	0.1
	95% CI	[0.3-1.8]	[0.2-1.4]	[0.9-5.1]	[0.1-1.4]	[0.0-1.0]
Other	%	0.7	0.3	0.3	0.6	0.5
	95% CI	[0.3-1.6]	[0.1-1.2]	[0.0-2.4]	[0.2-1.6]	[0.2-1.4]

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

Types of toilet facilities used by households were further divided into improved and unimproved, based on the WHO & UNICEF Joint Monitoring Programme (JMP) definition. Improved toilets include flushed or flushed to septic tanks, piped sewer systems, pit latrines, VIP latrines, and pit latrines with slabs (WHO and UNICEF, 2017). Meanwhile, unimproved toilets consist of 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 (WHO and UNICEF, 2017). The study results show that most of the households were using improved sanitation facilities (98.6%). Ehlanzeni (97.9%) and Nkangala (98.5%) districts had the highest proportion of households using improved sanitation facilities (Figure 16).

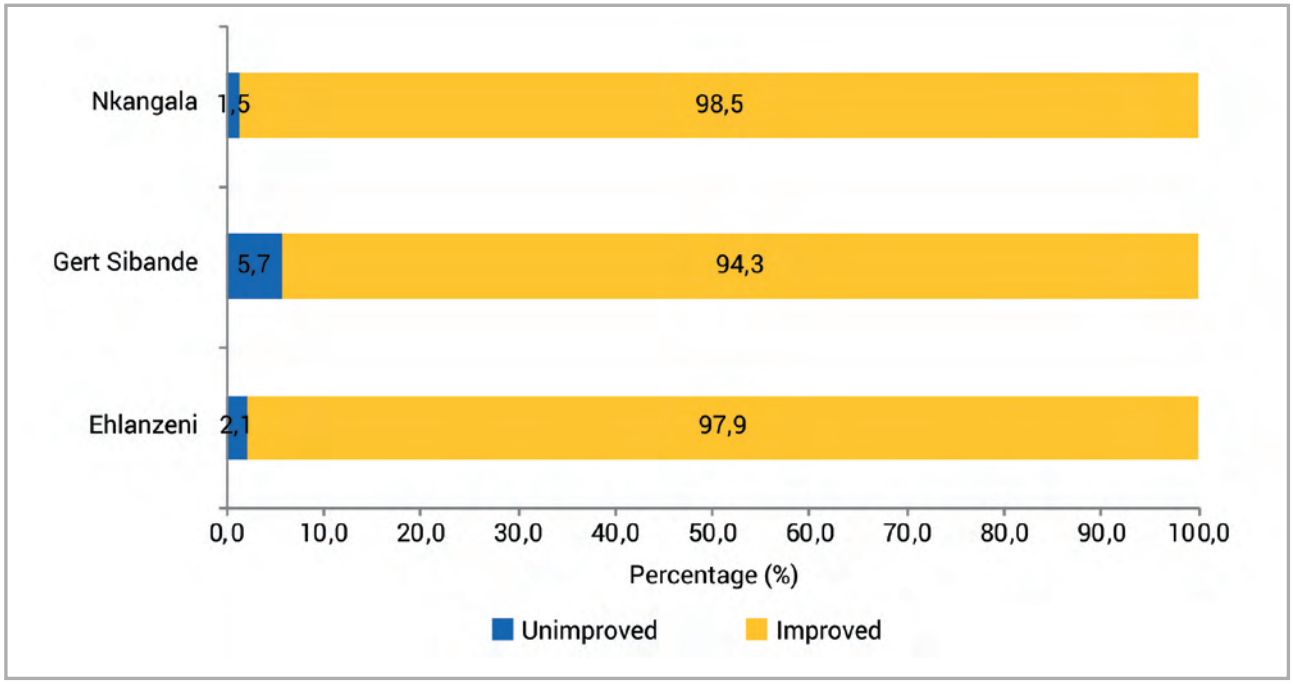


Figure 16: *Improved and unimproved toilet types*

When asked whether the households receive free sanitation as part of the South African Government's free basic services policy, only 17.7% responded 'yes' (Figure 17). Around 5.5% of the respondents did not know if their households received free sanitation services. Nkangala district had the highest proportion of households who received free sanitation services (20.2%) (Table 28).

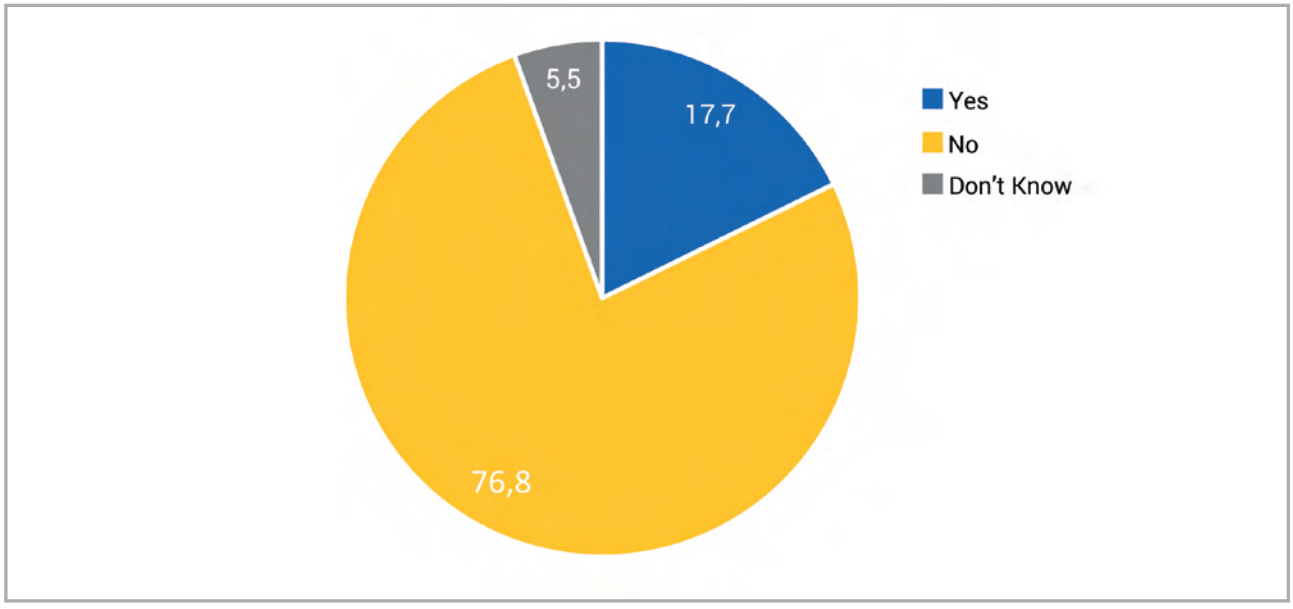


Figure 17: *Proportion of households receiving free sanitation services (n=499)*

Table 28: Households receiving free sanitation by sex of the household head and district

	Yes		No		Don't know		Total (n)
	%	95% CI	%	95% CI	%	95% CI	
Household head sex							
Male	16.4	[11.4-23.1]	79.2	[72.8-84.4]	4.4	[1.9-9.9]	241
Female	18.8	[13.8-25.0]	74.6	[68.4-79.9]	6.6	[3.7-11.6]	257
District							
Ehlanzeni	17.2	[12.0-24.0]	76.2	[68.7-82.3]	6.6	[3.5-12.2]	294
Gert Sibande	16.2	[8.2-29.5]	81	[69.0-89.1]	2.8	[0.7-10.5]	114
Nkangala	20.2	[11.0-34.1]	73.7	[62.7-82.3]	6.1	[2.7-13.4]	91

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

5.4.1 Refuse removal

Table 29 shows that most households dispose of their rubbish in their own refuse dump (46.5%). Only 17.2% of the household rubbish was removed by local authority/private company at least once a week. Communal dumps were used by 9.9% of the households. The proportion of households who dump their rubbish anywhere accounted for 8.2% of the rubbish disposal methods.

Table 29: Household rubbish disposal

Rubbish disposal method (n=1511)	Number (n)	Percentage (%)
Own refuse dump	686	46.5
Removed by local authority/private company at least once a week	260	17.2
Communal refuse dump	144	9.9
Removed by community members, contracted by municipality at least once a week	153	9.4
Dump or leave rubbish anywhere	133	8.2
Other	57	4.0
Removed by local authority/private company less often than once a week	37	2.2
Communal container/central collection point	20	1.3
removed by community members, contracted by municipality less than once a week	17	1.1
Removed by community members, less often than once a week	3	0.2
Removed by community members at least once a week	1	0.1

Figure 18 shows that most households (74%) do not receive free refuse removal services. Around 2.2.% of the households did not know if their households were receiving free refuse removal services.

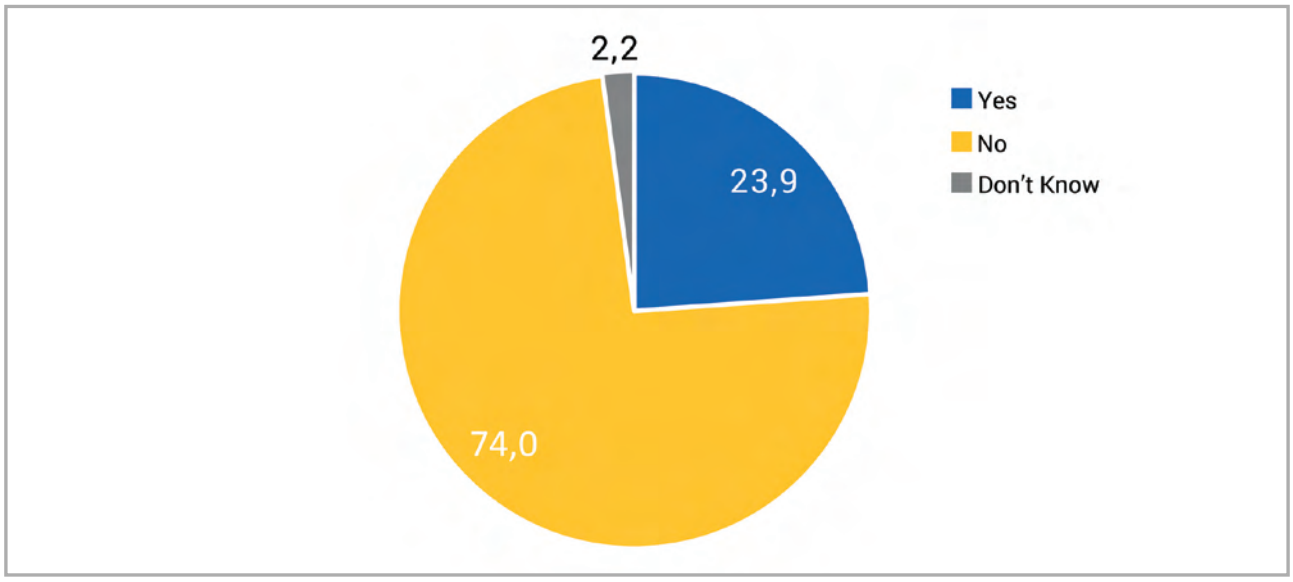


Figure 18: *Proportion of households receiving free refuse removal services (n=471)*

5.5 Energy and Hygiene

5.5.1 Access to electricity

Figure 19 shows that the majority (94.1%) of the households in Mpumalanga Province had access to electricity. Of the households with access to electricity, 96.2% were connected to the main electricity supply.

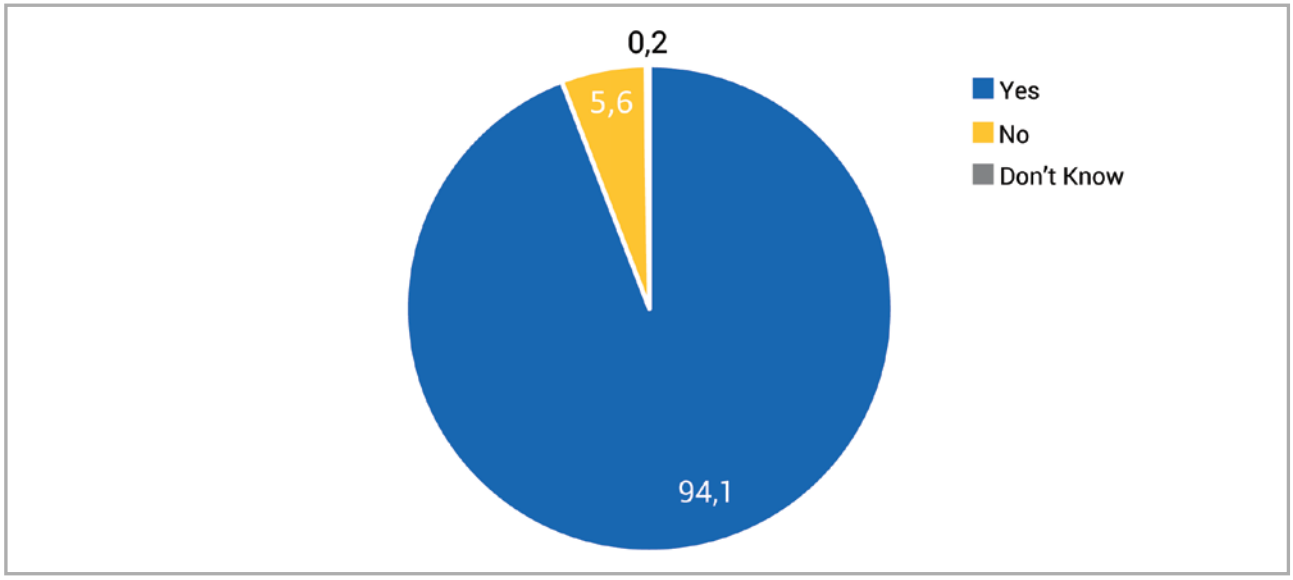


Figure 19: *Proportion of households with access to electricity (n=1552)*

Table 30 shows notable difference between sex of the household head and access to electricity (Table 30). Nkangala District (95.9%) had the highest proportion of households with access to electricity, while Gert Sibande (92.3%) had the least.

Table 30: Access to electricity by household sex and district

	Yes		No		Don't know		Total (n)
	%	95% CI	%	95% CI	%	95% CI	
Household head sex							
Male	93.7	[89.8-96.2]	6.3	[3.8-10.2]	0		788
Female	94.6	[92.0-96.4]	4.9	[3.3-7.4]	0.5	[0.2-1.5]	760
District							
Ehlanzeni	93.1	[88.6-95.9]	6.9	[4.1-11.4]	0		470
Gert Sibande	92.3	[85.8-95.9]	7.5	[3.9-14.1]	0.2	[0.0-1.5]	480
Nkangala	95.9	[90.5-98.3]	3.7	[1.5-9.1]	0.4	[0.1-1.4]	602

5.5.2 Energy sources for cooking, lighting, water heating, and space heating

Energy sources were categorised into cooking lighting, water heating, and space heating (Table 31). The results show that the most common energy source for cooking was electricity from the mains (79.5%). The second most common energy source for cooking was wood (12.1%). Only 3.4% of the households reported using coal as the main energy source despite Mpumalanga Province being the leading coal producer in Africa. Less than 1% of the households were using paraffin as the main energy source for cooking.

Table 31: Household main source of energy for cooking, lighting, water heating, and space heating

	Cooking	Lighting	Water heating	Space heating
	%	%	%	%
Electricity from mains	79.5	98.0	78.3	49
Wood	12.2	0.2	10.2	6.8
Coal	3.5	0.1	3	6.5
Gas	3.1		1.3	2.2
Paraffin	0.8	0.1	0.7	0.3
Other	0.4	0.3	0.6	0.4
Other sources of electricity (e.g., Generators)	0.4	0.8	0.6	0.3
Animal Dung	0.1		0.2	0.2
None	0.1	0.1	4.8	34.2
Candles		0.5		
Solar energy			0.7	0.1

Most of the households using electricity from mains as the main source of energy for cooking are headed by males (83.2%) as compared to females (75.8%) (Table 32). A high proportion of female-headed (15.6%) households used wood as the main energy source for cooking (Table 32). Gert Sibande had the highest proportion of households using electricity from mains as the main source of energy for cooking, followed by Nkangala (79.6%). Ehlanzeni (12.2%) had the highest proportion of households using coal as the main source of energy for cooking, while Nkangala had the least (0.2%). The proportion of households using wood as the main energy source for cooking was higher in Nkangala (17.8%).

Table 32: Source of energy for cooking by sex of the household head and district

		Household head sex		District		
		Male	Female	Ehlanzeni	Gert Sibande	Nkangala
Electricity from mains	%	83.2	75.8	73.1	84.1	79.6
	95% CI	[78.3-87.1]	[69.8-80.9]	[62.6-81.5]	[79.4-87.9]	[71.2-86.1]
Other sources of electricity (e.g., generator)	%	0.6	0.1	0.6	0.4	0.2
	95% CI	[0.2-1.6]	[0.0-0.9]	[0.1-2.5]	[0.1-1.7]	[0.0-1.2]
Gas	%	3.5	2.6	2.9	5.6	1.4
	95% CI	[2.1-5.8]	[1.6-4.1]	[1.5-5.5]	[3.3-9.4]	[0.7-2.8]
Paraffin	%	0.9	0.7	0.6	1.9	0.2
	95% CI	[0.3-2.5]	[0.3-1.7]	[0.2-1.7]	[0.7-4.9]	[0.0-1.3]
Wood	%	8.8	15.6	10.1	5.2	17.8
	95% CI	[5.5-13.9]	[10.9-21.8]	[4.2-22.2]	[2.8-9.3]	[11.4-26.7]
Coal	%	2.2	4.9	12.2	2.2	0.2
	95% CI	[1.1-4.2]	[2.8-8.3]	[7.3-19.8]	[0.9-5.1]	[0.0-1.1]
Animal dung	%	0	0.3	0.6	0	0
	95% CI		[0.0-1.8]	[0.1-3.8]		
Other	%	0.7	0.2	0	0.6	0.5
	95% CI	[0.2-2.1]	[0.0-1.3]		[0.1-2.2]	[0.1-2.2]
None	%	0.1	0	0	0	0.2
	95% CI	[0.0-1.1]				[0.0-1.1]

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

Table 33 shows that almost all households in Mpumalanga Province used electricity from the mains as the main energy source. Less than one percent of the households used candles, paraffin, and wood as the main energy source for lighting (Table 33). The most common energy source for water heating was electricity from the mains (78.3%). This was followed by wood (10.2%) and coal (3%). About 1.3% of households used gas as the main energy source for water heating (Table 33). A high proportion of female-headed (11.7%) households used wood as the main source of energy for water heating when compared to males (8.6%) (Table 33). Nkangala District had the highest proportion of households using electricity from the mains as the main energy source for water heating. The highest proportion of households using wood as the main energy source for water heating was in Nkangala (14.7%). Ehlanzeni (10.3%) leads with the proportion of households using coal as the main energy source for water heating (Table 33).

Table 33: Source of energy for water heating by sex of the household head and district

		Household head sex		District		
		Male	Female	Ehlanzeni	Gert Sibande	Nkangala
Electricity from the mains	%	79.6	76.9	75.4	78.8	79.4
	95% CI	[75.4-83.3]	[71.9-81.3]	[66.3-82.7]	[72.7-83.8]	[73.6-84.1]
Other sources of electricity	%	0.7	0.5	0.6	0.4	0.7
	95% CI	[0.3-1.7]	[0.1-1.5]	[0.1-2.5]	[0.1-1.5]	[0.3-1.8]
Gas	%	1.3	1.4	0.5	3.5	0.3
	95% CI	[0.5-3.5]	[0.7-2.7]	[0.1-3.4]	[1.8-6.7]	[0.1-1.3]
Paraffin	%	0.9	0.5	0.8	1.1	0.4
	95% CI	[0.4-2.0]	[0.2-1.4]	[0.3-1.9]	[0.4-3.1]	[0.1-1.4]
Wood	%	8.6	11.7	4.6	7.3	14.7
	95% CI	[6.1-12.0]	[8.2-16.5]	[1.8-11.2]	[4.1-12.5]	[10.6-20.2]
Coal	%	2.1	4	10.3	2	0.2
	95% CI	[1.1-4.1]	[2.3-7.0]	[6.1-16.9]	[0.9-4.3]	[0.0-1.1]
Animal Dung	%	0.1	0.2	0.4	0.2	0
	95% CI	[0.0-1.0]	[0.0-1.3]	[0.1-2.5]	[0.0-1.6]	
Solar Energy	%	0.8	0.7	0	0	1.6
	95% CI	[0.1-5.6]	[0.3-1.8]			[0.4-5.8]
Other	%	0.5	0	0	0.2	0.3
	95% CI	[0.1-2.0]			[0.0-1.8]	[0.0-2.4]
None	%	5.5	4.1	7.5	6.5	2.4
	95% CI	[3.4-8.8]	[2.3-7.2]	[4.0-13.7]	[3.2-12.7]	[0.9-6.1]
Total (n)		**729**	**704**	**430**	**434**	**573**

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

The most common energy source for space heating was electricity from the mains (Table 34). About 34.2% of the households did not use any energy sources for space heating. Coal and wood were the main energy source for space heating for 6.8% and 6.5% of the households, respectively. Gas was used for space heating by a few households (2.2%). Most of the households using coal (7.1 %) and wood (7.8%) as the main energy source for space heating were female-headed (Table 34). Nkangala (54.8%) had the highest proportion of households using electricity from the mains as the energy source for space heating. Ehlanzeni had the highest proportion of households using wood and coal as the main energy source for space heating. Nkangala District had the highest proportion of households not using anything for space heating. Most households using wood and coal as the main energy source were female-headed.

Table 34: Main source of energy for space heating by sex of the household head and district

	Household head sex		District		
	Male	Female	Ehlanzeni	Gert Sibande	Nkangala
	%	%	%	%	%
Electricity from mains	49.4	48.5	44.9	43.6	54.8
Other sources of electricity (e.g., Generator)	0.5	0.2	0.6	0.6	0
Gas	2.3	2.2	2.9	3.7	0.9
Paraffin	0.3	0.2	0	0.5	0.2
Wood	5.7	7.8	8.2	7.3	5.8
Coal	5.9	7.1	15.6	9.4	0
Animal Dung	0.1	0.3	0.4	0.5	0
Other	0.6	0.2	0.4	1	0
None	35.1	33.4	26.8	33.4	38.3

5.6 Indigent households

Figure 20 shows that only 33.5% of the households are registered as indigent households. Around 2.4% of the households did not know if they were registered as indigents. Table 35 shows that most households were registered as indigents were female-headed (36.4%), against male-headed (30.8%). Ehlanzeni (39.3%) had the highest proportion of households registered as indigents, while Gert Sibande had the least (30%).

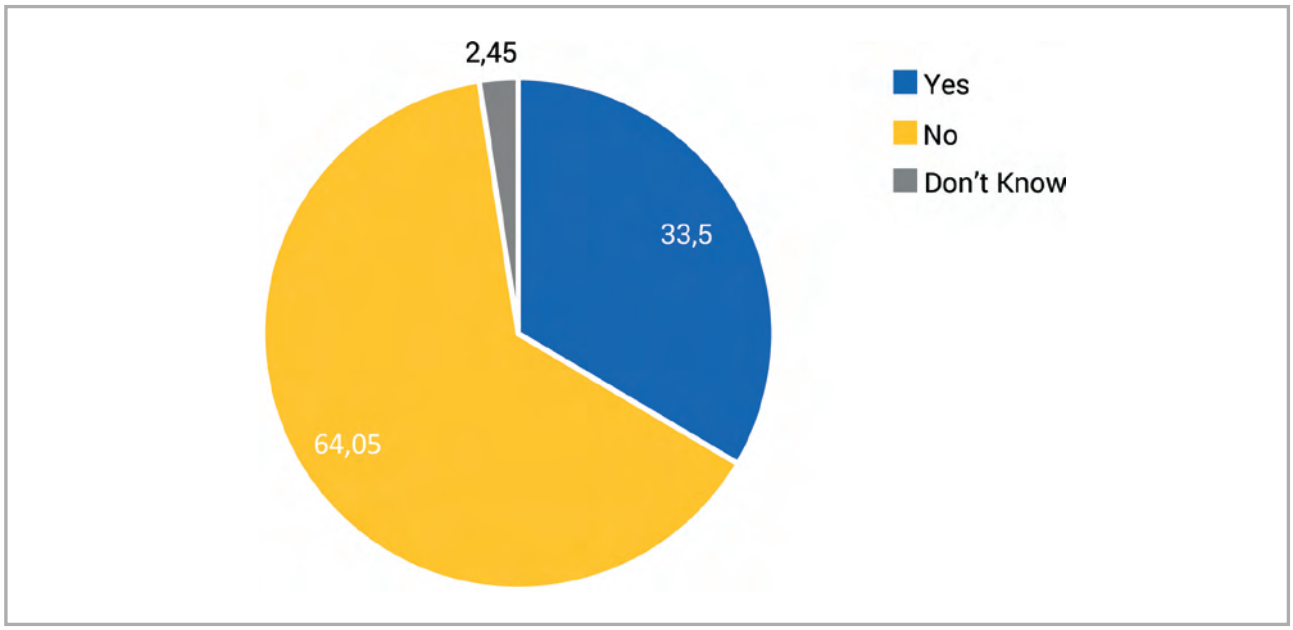


Figure 20: *Proportion of the household registered as indigent (n=1 581)*

Table 35: Households registered as indigent by sex of the household head and district

	Yes		No		Don't know		Total (n)
	%	95% CI	%	95% CI	%	95% CI	
Household head sex							
Male	30.8	[26.2-35.8]	67.2	[62.5-71.5]	2	[1.2-3.5]	803
Female	36.4	[31.3-41.9]	60.7	[55.5-65.7]	2.9	[1.8-4.7]	774
Total	**33.5**	**[29.4-37.9]**	**64**	**[60.0-67.8]**	**2.5**	**[1.7-3.6]**	**1,577**
District							
Ehlanzeni	39.3	[31.2-48.0]	58	[49.2-66.4]	2.7	[1.5-4.7]	467
Gert Sibande	30	[24.9-35.7]	68.2	[62.7-73.2]	1.8	[0.9-3.4]	503
Nkangala	33.1	[26.4-40.6]	64.1	[57.7-70.0]	2.8	[1.5-5.0]	611
Total	**33.5**	**[29.4-37.8]**	**64.1**	**[60.1-67.8]**	**2.5**	**[1.7-3.5]**	**1,581**

6 Agriculture

6.1 Agriculture and Production Systems

This section focuses on the food availability dimension which tries to unpack how food is produced within the province by various households. 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.

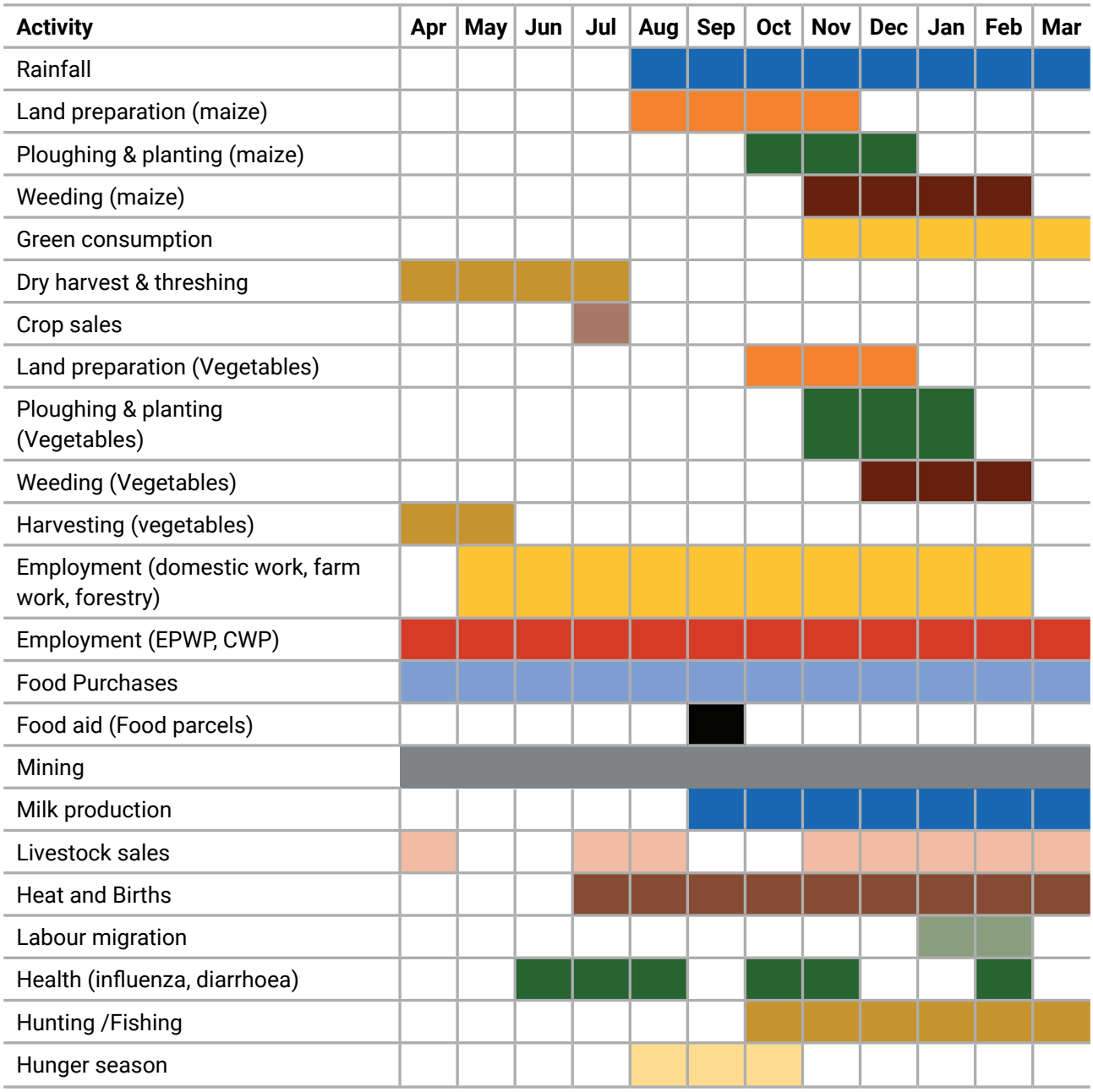


Figure 21: *Seasonal calendar (Source: HEA, Qualitative Output)*

Findings from the HEA focus group discussions indicate that agricultural production and value chains have a critical role in household food and nutrition security. Figure 21 depicts a seasonal calendar in Mpumalanga Province. The rainy season (September to February) is characterised by land preparation, planting, and weeding. Much of the rural life in the zone is still determined by agricultural seasons, although this has been ameliorated by employment, mining, and social grants, which are year-round contributors to people's livelihoods. Livelihoods information is organised temporally by consumption year, which begins with the start of the main dry harvest and runs through to just before the next year's main dry harvest. In this zone, the main dry harvest begins in April, so the consumption year begins that month and runs up until the end of the following March. The livelihood strategies presented in this document also apply to a particular year, one that is neither very good nor bad, but is 'typical' or occurs frequently.

The main season for farming begins with land preparation in August. It then proceeds throughout the spring, followed by ploughing and planting from October to December, depending on the timing of the rains. Weeding (a period of intense activity) takes place from December to February, with the green harvest starting in December and finishing in March. Dry harvesting takes place from April to July. Crops usually are sold, if that is possible, in July. Vegetables follow a slightly different pattern, with land preparation beginning in October and ending in December, overlapping with ploughing and planting from November to January, weeding from December to February, and harvesting in April and May.

6.1.1 Household access to land

In South Africa as a country, 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).

Overall, access to land by households in Mpumalanga is very limited (Figure 22). Ehlanzeni District has the highest percentage (slightly above 30%) of households with limited access to land with a relatively high similar trend in Gert Sibande (25%). Even though Gert Sibande is the largest district in the province, covering almost half the land area (31 841 km2), only 25% of people have access to land (Figure 22). This is largely because these districts are characterised by mining, industrial, and agricultural activities in which land is mainly used for those economic activities e.g., Gert Sibande boasts the most diverse economy, with the largest underground mining complex in the world. It also has the largest agricultural sector as well as some of the major industrial complexes in South Africa i.e., it is home to SASOL. Carolina, Bethel, and Ermelo are also known to produce the most sheep and wool in South Africa, hence very few people have access to land, since the land is owned by the government for conservation, or by industries and other agricultural entities.

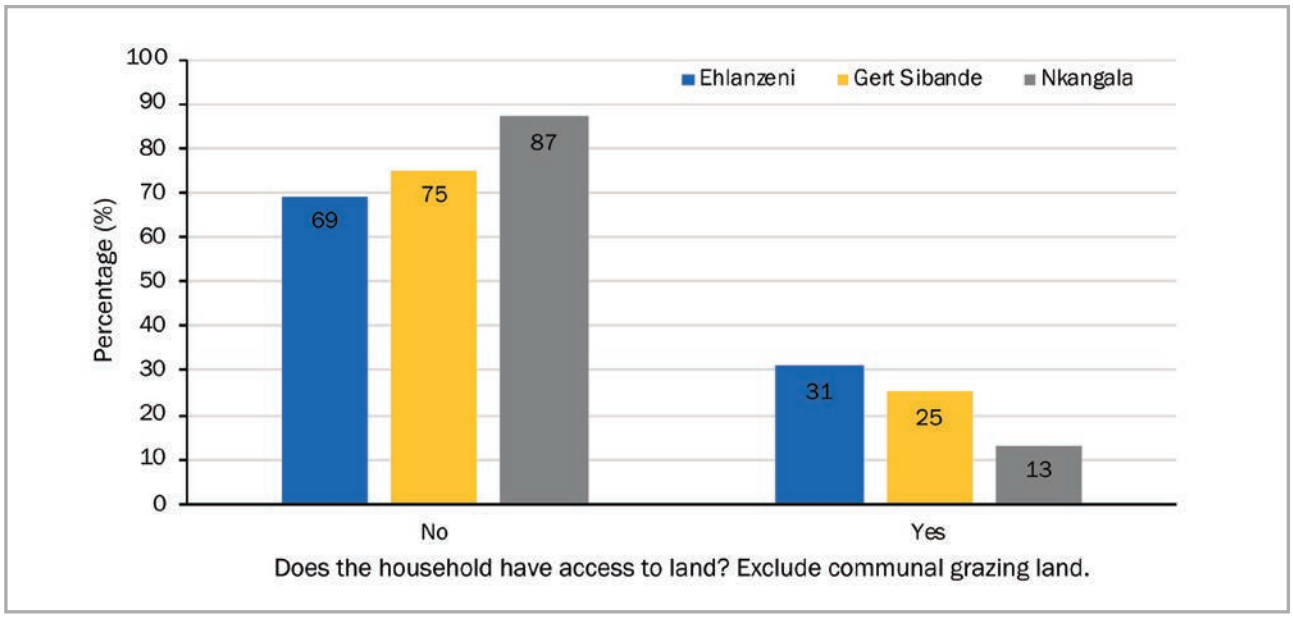


Figure 22: *Household access to arable land in Mpumalanga Province*

Disaggregated by gender, both female- and male-headed households were not accessing land. However, this is more pronounced among females in all the districts expect for Gert Sibande. Of the paltry 31% of households that had access to arable land in Ehlanzeni District, 56% were female-headed while 44% were male-headed. Similarly, in Gert Sibande District, the 25% of households that reported having access to land, 71% were female-headed (Figure 23) while only 29% male-headed reported access to agricultural land. This is mainly attributable to the fact that most men in Mpumalanga were mainly into formal employment and semi-skilled labour provisioning in urban areas. `In addition, it should be noted that in accordance with the 2016 community survey, Gert Sibande's total population is constituted of mostly females, and that perhaps it can be ascribed to the greater number of women having access to land. Of those households that reported inaccessibility to arable land, most of these were male-headed in Gert Sibande (54%) and Nkangala (52%), while women reported 46% and 48% inaccessibility, respectively. Ehlanzeni was an exception, where females reported 53% and men reported 47% inaccessibility to arable land. These results call for the empowerment of women through increased support in the form of inputs supply, market access, finance, and extension services which would eventually improve household food availability and consumption.

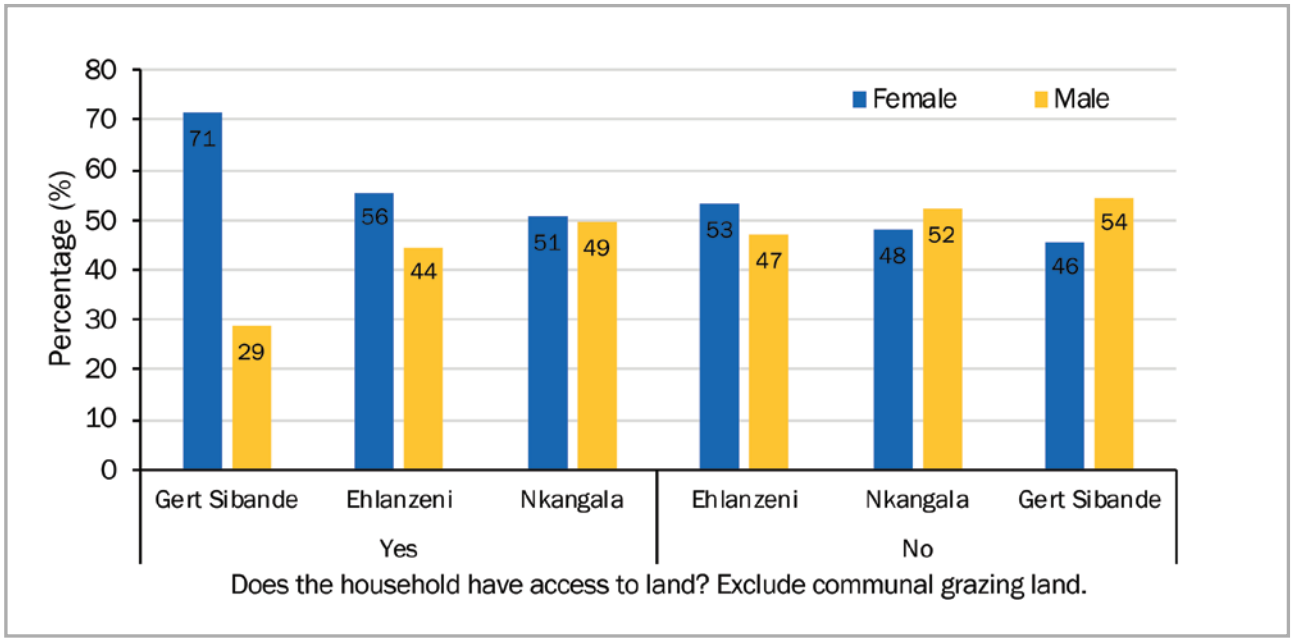


Figure 23: *Land access disaggregated according to household head sex*

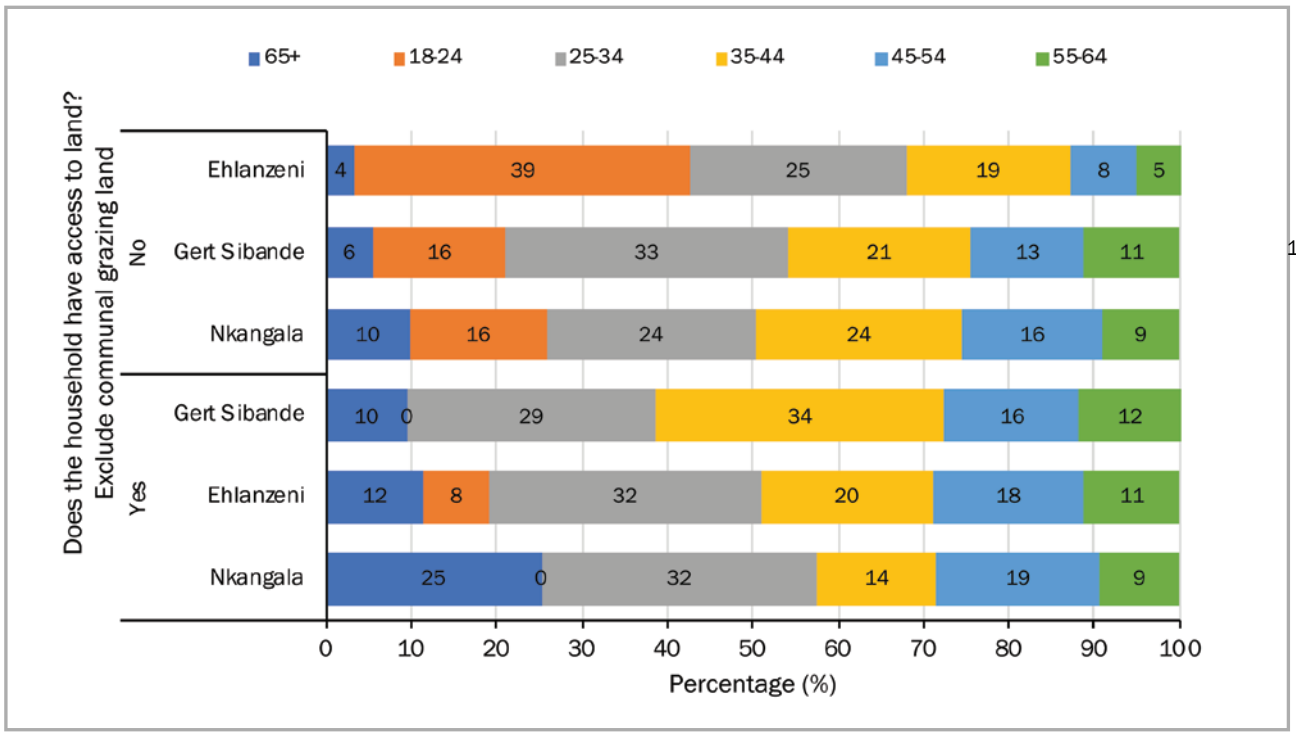


Figure 24: *Households access to land per age group across the three districts of the Mpumalanga Province*

Land access varied disproportionately according to the different age categories as shown in Figure 25. Almost entirely, all the respondents in the 20-34 years age category have very limited access to land, and across the three districts only less than 5% of Ehlanzeni District residents reported to have access to land. As expected, access to land increased with increase in age. However, for the youthful age of 18 years to about 35 years, their access to land is very limited with the maximum being about 5% only in Ehlanzeni and Nkangala. It should be noted that in both Nkalanga and Gert Sibande the population is mostly the youth, hence such a high percentage of people with no access to land. 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.

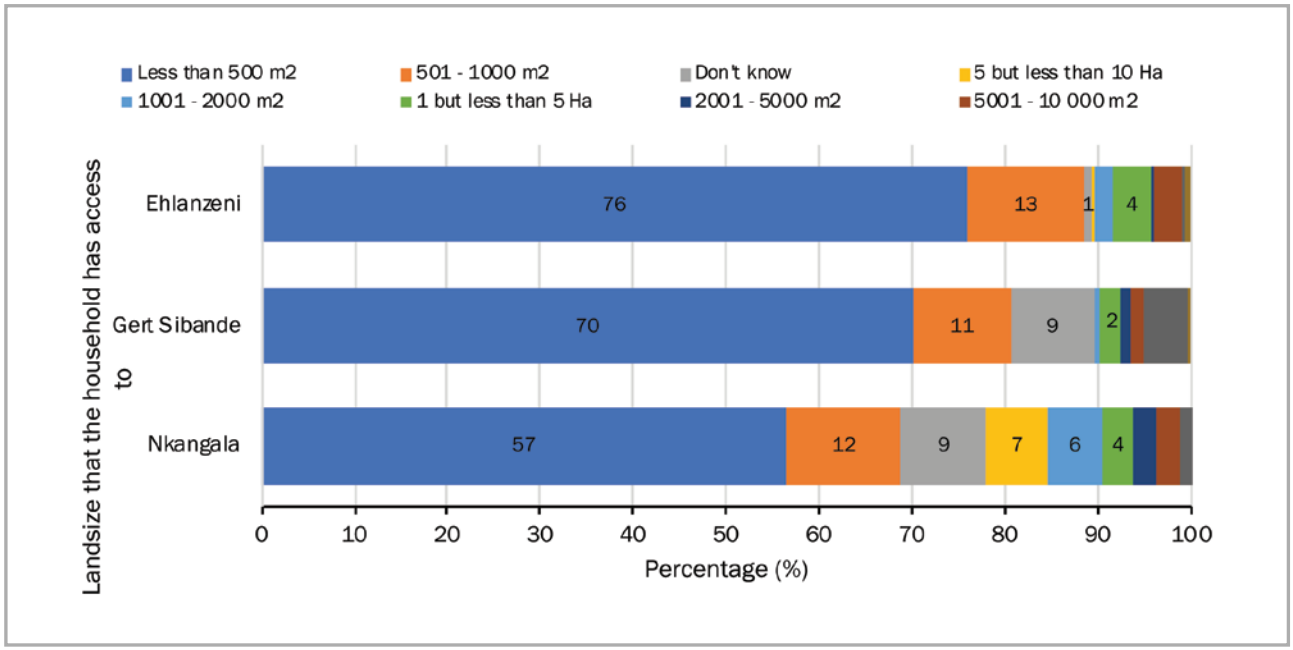


Figure 25: *Estimated land size that the households have access to in the Mpumalanga Province*

Most of the households in Mpumalanga province have access to arable land that is less than 500m^2 in size. This is a clear indication that most of the land reportedly owned is primarily for residential purposes, and very little is allocated for backyard farming. On average, about 12% of the households in Mpumalanga Province owns land in the category of 500-1000m^2. Very few households (less than 5%) own large tracts of land (5001-10000m^2) This pattern follows a similar pattern to the one reported in Limpopo Province where the majority of the land holders were owning less than 500m^2.

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 26), with Ehlanzeni and Nkangala households at the forefront with 89% and 86%, respectively. This result indicates that the majority of the reported landowners were merely for residential purposes and not enough for agriculture production purposes. However, there is a small percentage of households who reside in land which is owned by the tribal authorities, and Ehlanzeni District had the highest with 6.4%, followed by Nkangala with 6.3%. Ownership of the land in this context is mainly small areas for dwelling, with very limited backyard farming or gardening.

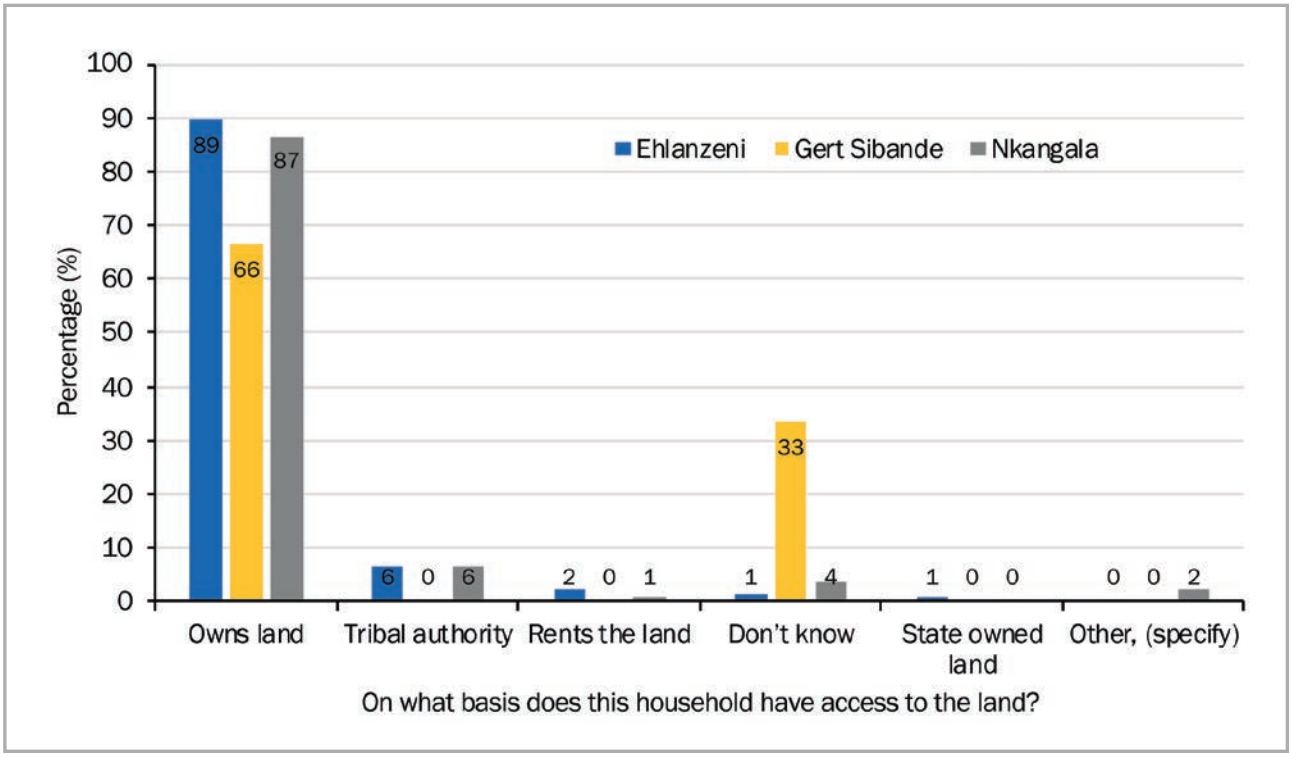


Figure 26: *Land tenure in the study area*

6.1.3 Use of land for food production or other agricultural products

Within the province, at least 30% of the households in those districts use the land for food production and other agricultural products. However, the average land size allocated for agriculture production is less than 3ha, as reported from HEA focus group discussions where less than a quarter (0-0.25Ha) of a hectare was widely reported by the 'very poor' and 'poor' households as the largest land size cultivated. Therefore, the land that was regarded as 'owned' was primarily meant for residential purposes, with very limited backyard farming. It should be noted that Mpumalanga has a high proportion of commercial farming, hence that as well influences the low level of involvement of farming since the residence can get access to the agricultural products at factory prices/lower prices.

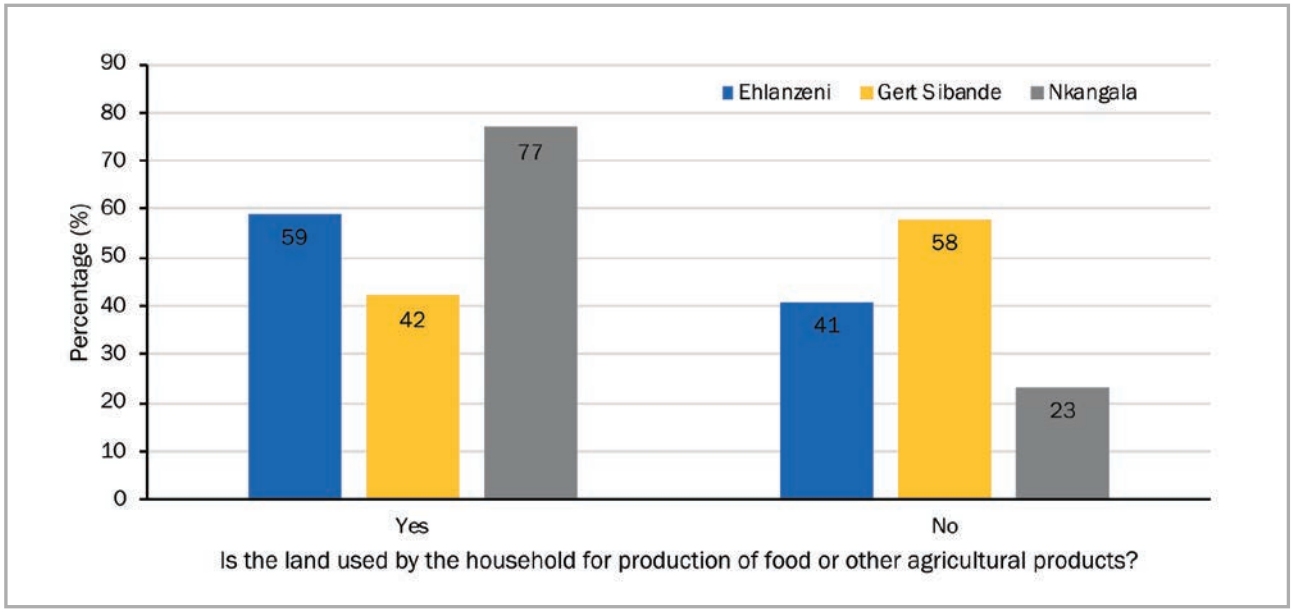


Figure 27: *Land use for food and other agricultural production*

6.1.4 Crop and livestock production

Households in Mpumalanga are practising livestock production at an extremely low percentage. Gert Sibande District Municipality has the highest level of participation in agricultural production with a value of 10% (Figure 28). The low level of participation by households in livestock prodcution maybe ascribed to the high proportion of commercial agriculture in the area. In Gert Sibanda, livestock production is highly practised, with the biggest production of sheep and wool in the country.

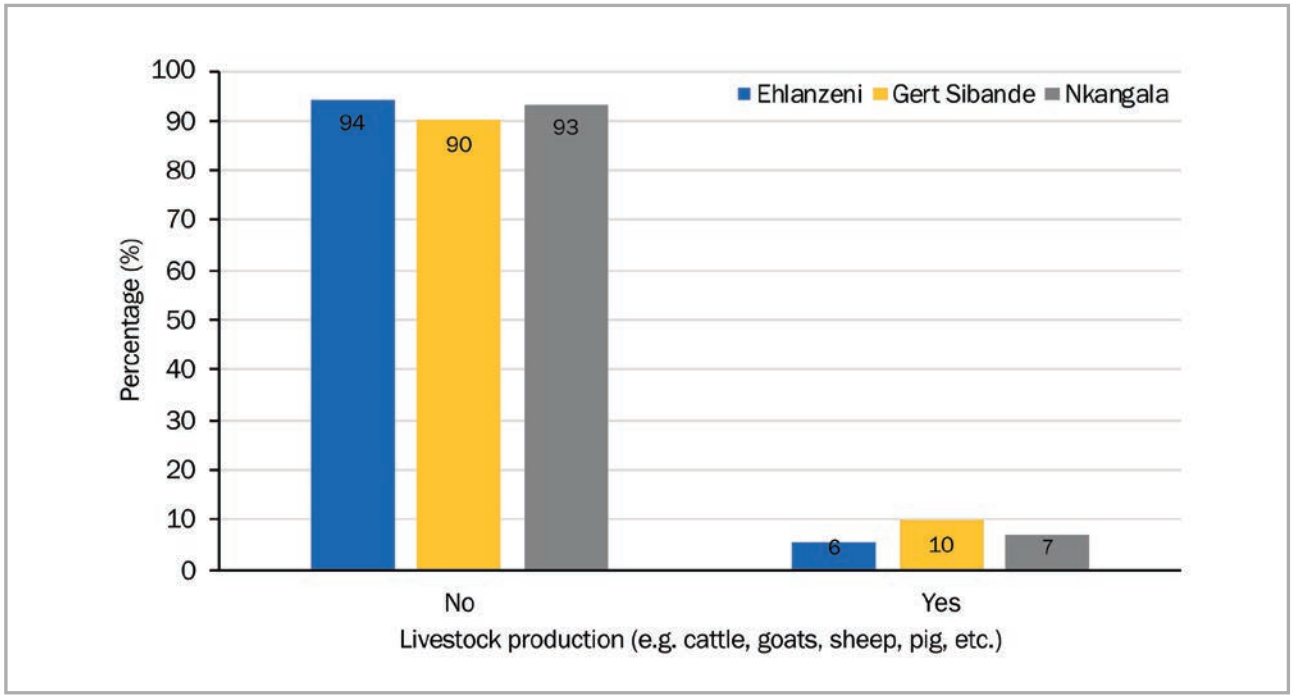


Figure 28: *Livestock production by district in the Mpumalanga Province*

Generally, poultry production is not practised by the majority of households in Mpumalanga Province. The results indicated that over 80% of the households in all the three districts were not involved in poultry enterprises. The least level of poultry production was reported in Ehlazene District, with almost 10% of the households engaged in the enterprise (Figure 29). The low level of poultry production might be ascribed to

the high concentration of commercial poultry farms and factories within the area. In general, agricultural activities in the area are low because Mpumalanga is regarded as the economic hub of the country. There are major sectors contributing to the GDP of the province and country as a whole - like mining, manufacturing, energy utilities, and construction.

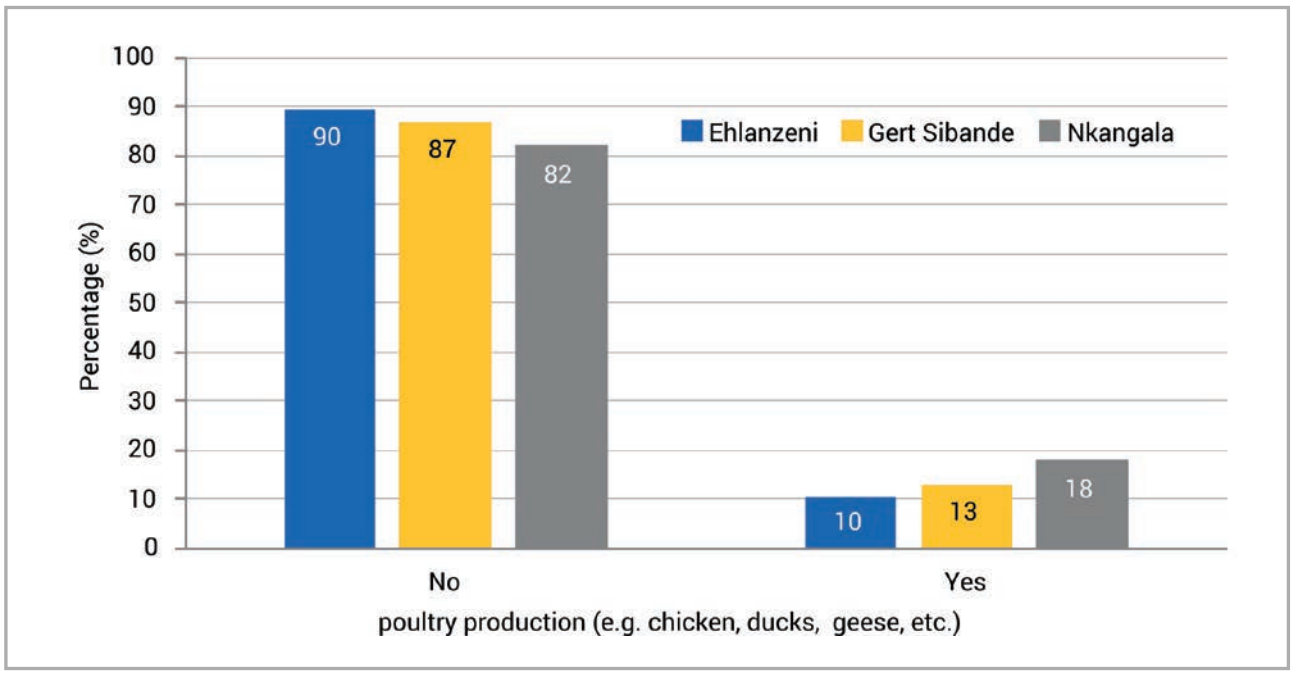


Figure 29: *Poultry production by district in Mpumalanga Province*

Households in Mpumalanga Province reported an extremely low percentage of engagement in grain crop production, with at most 8% of all the three districts reporting participation in cropping (Figure 30). Even though the climate of Mpumalanga is suitable for grain production, the level of participation by households is very low. This is because of the high level of commercial agricuture in the area. The area is also semi-urban and such kinds of settlements have low levels of participation in substance farming. Most of the land is also used for other economic activities, such as mining, conservation (Kruger National Park), and energy production , so the the land available for crop production becomes less.

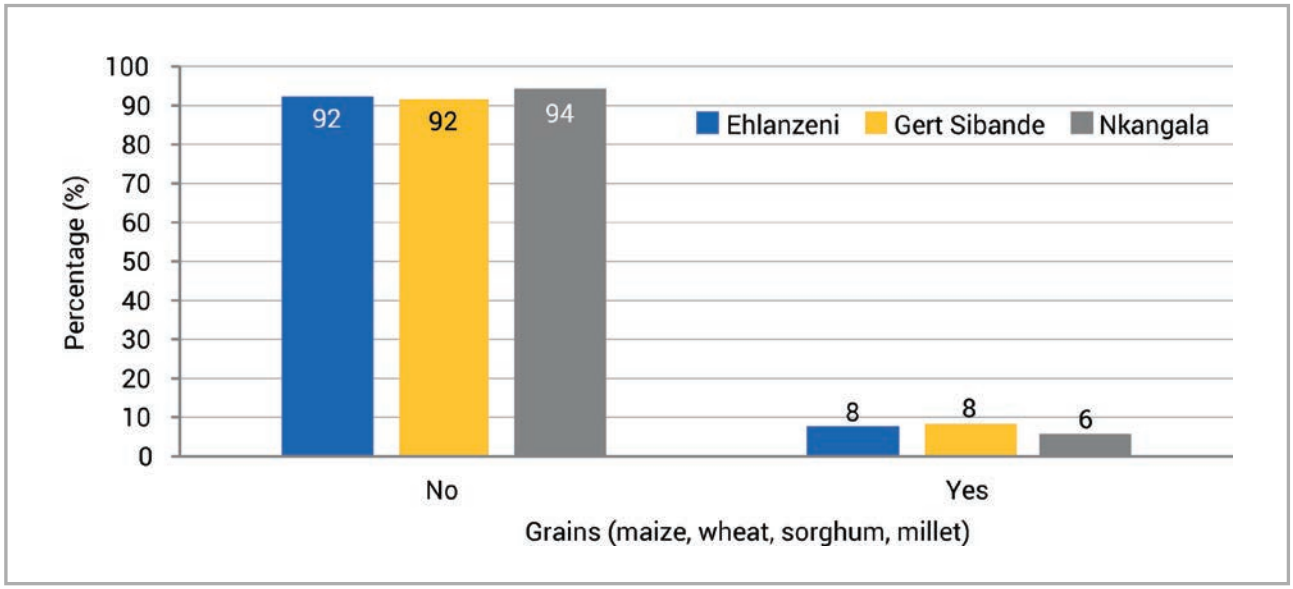


Figure 30: *Household involvement in crop production in Mpumalanga Province*

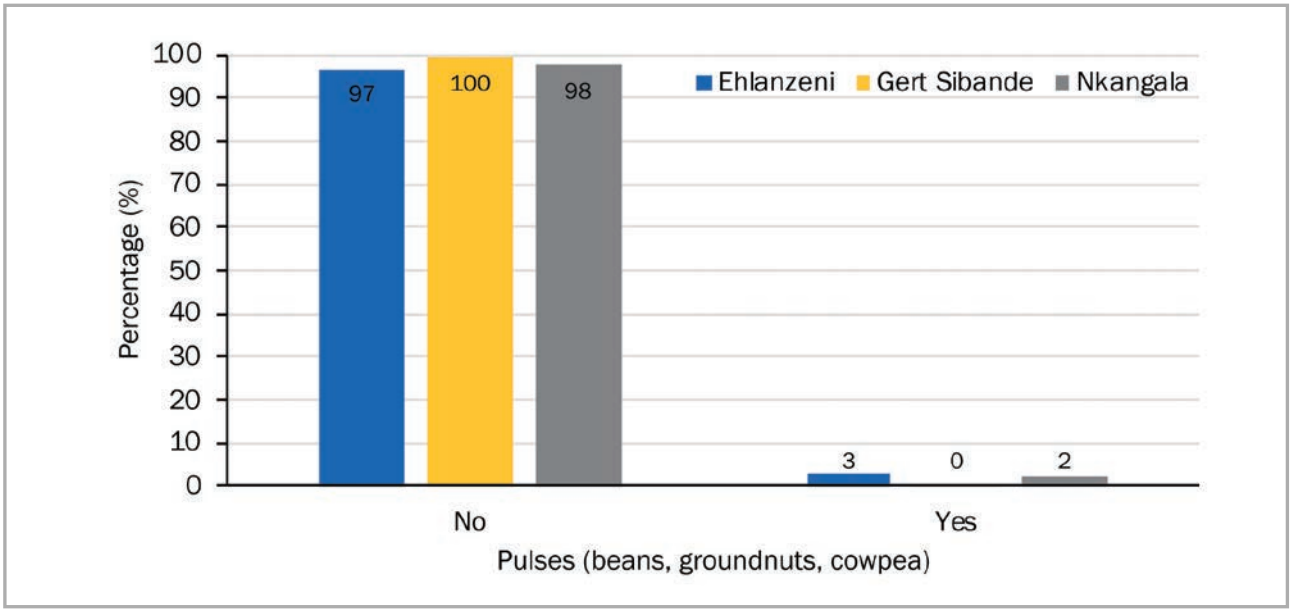


Figure 31: *Pulses production by district in Mpumalanga Province*

The production of pulses was least reported to be practised by most households in Mpumalanga Province with all the three districts reporting less than 5% (Figure 31). More than 90% of the households across all the districts in Mpumalanga Province do not produce pulses.

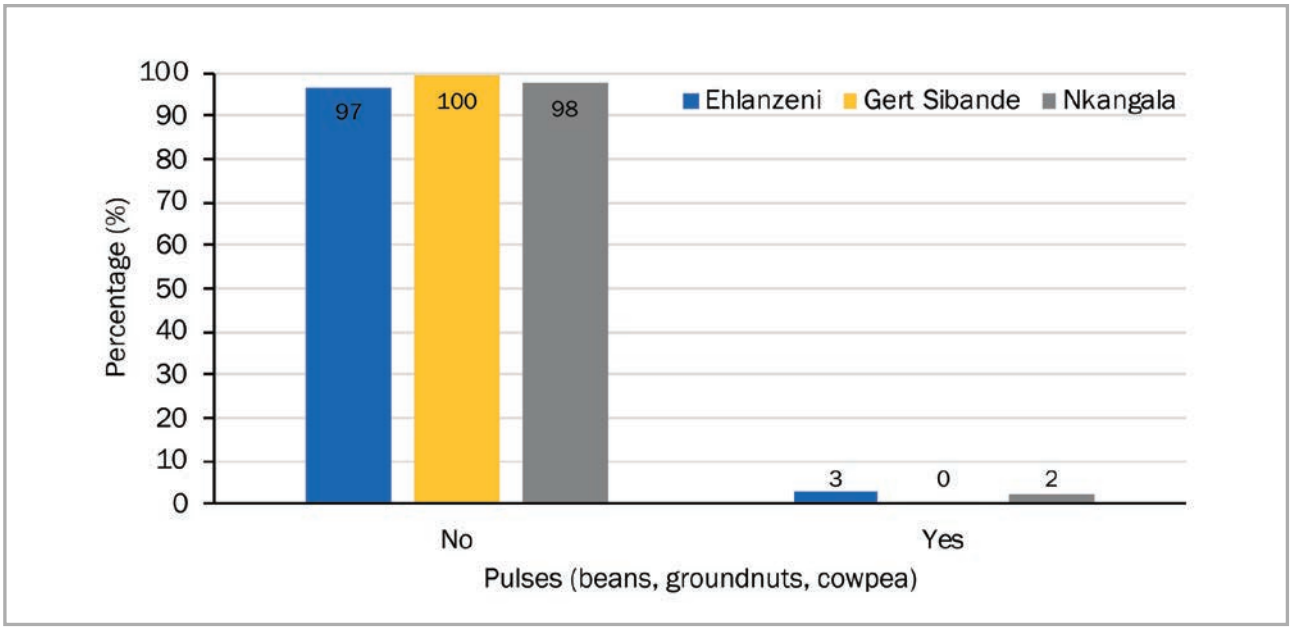


Figure 32: *Household fruit production in Mpumalanga Province*

Fruit production was reported to be extremely low in all the districts in Mpumalanga. The highest engagement on fruit production was almost 10% in Ehlanzeni (Figure 32). The low involvement of households in Mpumalanga might be ascribed to large commercial farms in the area. Mpumalanga has always been a large producer of citrus fruits, with Ehlanzeni Municipality being the largest producer of oranges. However, the results should be treated with caution since they show the narrative from a household level.

6.1.5 Major Crops Grown

This section presents major crops and fruits grown in the three districts in Mpumalanga.

Table 36: Major crops and fruits grown in Mpumalanga Province by households with access to agricultural land

Crop choice	Ehlanzeni	Gert Sibande	Nkangala	n
	%	%	%	
Maize	79.5	20.5	0.0	9
Sorghum	0.0	0.0	0.0	0
Millet	0.0	0.0	0.0	0
Groundnuts	100.0	0.0	0.0	3
Cowpea	100.0	0.0	0.0	2
Fruits	0.0	0.0	100.0	1
Wheat	0.0	0.0	0.0	0

Table 36 depicts the major crops and fruits that are grown in Mpumalanga Province. Ehlanzeni District is the main district in which maize is produced (79.5%), whilst Gert Sibande is the least maize farming district (20.5%). There is no household which plants maize in Nkangala (Table 33). This corroborates with the observations made in these districts where the rainfall patterns and soil fertility characteristics are suitable for maize production in Gert Sibande and Ehlanzeni. Nkangala households practise no maize farming due to its location in the northern part of Mpumalanga, wherein most cases agricultural activities are restricted due to the dominance of mining activities and conservation efforts in the province. Often the land for agriculture normally coincides with mining activities. The commodity mostly mined is coal, which is supplied to the Eskom power stations in and outside the district. Cow peas and ground nuts are also a popular produce in the Ehlanzeni District, with all the households sampled indicating that they plant them.

Table 36 depicts the major crops and fruits that are grown in Mpumalanga Province. Enhlazane District is the main district in which maize is produced (79.5%), whilst Gert Sibande is the least maize farming district (20.5%). There is no household which plants maize in Nkangala (Table 33). This corroborates with the observations made in these districts where the rainfall patterns and soil fertility characteristics are suitable for maize production in Gert Sibande and Enhlazane. Nkangala households practise no maize farming due to its location in the northern part of Mpumalanga, where in most cases, agricultural activities are restricted due to the dominance of mining activities and conservation efforts in the province. Often, the land for agriculture normally coincides with mining activities. The commodity mostly mined is coal, which is supplied to the Eskom power stations in and outside the district. Cow peas and ground nuts are also a popular produce in the Ehlanzeni District, with all the households sampled indicating that they plant them.

6.2 Wealth Breakdown, Food, and Income Sources

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 thus provide credible and 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 household vulnerabilities to different shocks and to estimate 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 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. Results emerging from the HEA focus group discussions indicate that the majority of the households in Mpumalanga are 'poor' and 'very poor'. This result is a cause for concern with regards to the government's interventions that need to be tailor-made for the province.

6.2.1 Highveld Border Open Access Livestock (ZABOL) of Ehlanzeni and Gert Sibande districts

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.

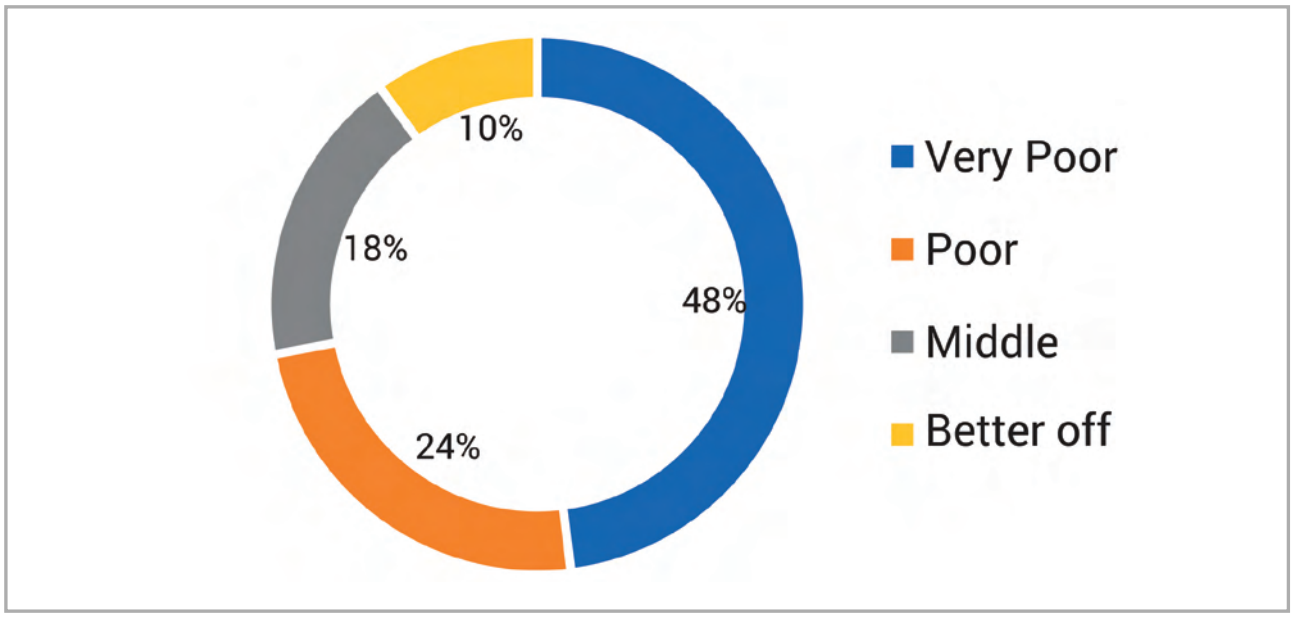


Figure 33: *Wealth breakdown in the ZABOL Livelihood Zone (ZABOL) (Source: HEA, Qualitative Output)*

Land holdings increase with wealth but not as exponentially as the factors listed above (0.25ha for the poorest against 2ha for the wealthiest) (Figure 33). The wealthiest households, described as the 'better-off', are those with permanent work, a salary and have business opportunities. They have an average annual income of R353,221 compared to the R54,690 of the 'very poor' households. Households that have lower-paying or less permanent formal employment and some business opportunities with an average annual income of R202,856 are referred to as the 'middle'. Those who depend primarily on grants are described as the 'poor' and 'very poor'; collectively, they are about 72% of households. These 'very poor' and 'poor' supplement their grant income with casual labour, self-employment and, in very small quantities, crops and livestock (Figure 33).

'Better-off' households are able to develop slightly more land and produce crops for sale, using savings from their other income sources to afford inputs (including labour). Similarly, they derive a small cash benefit from their animals. 'Middle' households also sell crops and livestock or livestock products. During the COVID-19 lockdown restrictions, the 'poor' and 'very poor' households are the ones who suffer the most impacts of food insecurity.

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 (Figure 33).

6.2.2 Highveld Open Access Intensive Cropping Livelihood Zone (ZAHIC) of Nkangala and Gert Sibande districts

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.

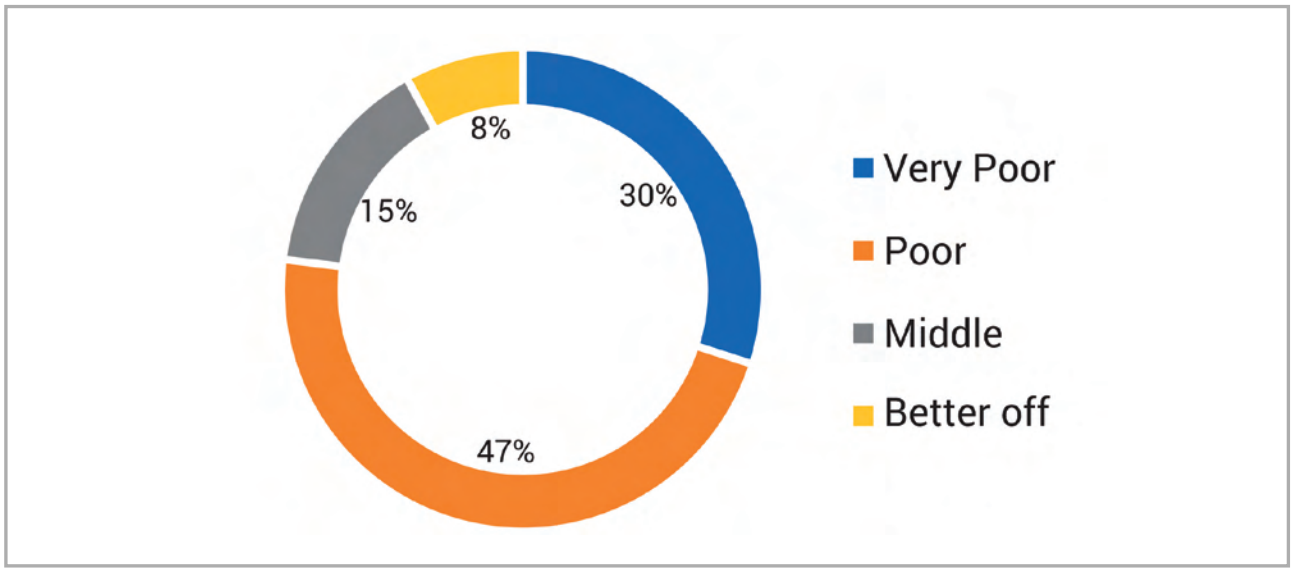


Figure 34: *Wealth breakdown in the northern open access cattle and dry land crops livelihood zone (ZAHIC) (Source: HEA, Qualitative Output)*

Land holdings increase with wealth but not as exponentially as the factors listed above (0.1ha for the poorest against 3ha for the wealthiest) (Figure 34). Since farming in this zone its important and this requires resources and capital, the amounts of land owned and cultivated vary with wealth. 'Better-off' households lever their fixed incomes and assets to develop more land and cultivate farms that are eight times larger than those of 'very poor' households.

The wealthiest households, described as the 'better-off', are those with permanent work, a salary, and have business opportunities. They have an average annual income of R386,284 compared to less than R5 000 per month of the 'very poor' households who struggle to meet their daily food and non-food needs (Figure 34). The results indicate income disparities among the 'poor' and 'better-off' households in the livelihood zone. Households that have lower-paying or less permanent formal employment and some business opportunities with an average annual income of R139 760 are referred to as the 'middle'. Those who depend primarily on grants are described as the 'poor' and 'very poor'; collectively, they are about 73% of households. These 'very poor' and 'poor' supplement their grant income with casual labour, self-employment and, in very small quantities, crops and livestock (Figure 34).

'Better-off' households are able to develop slightly more land and produce crops for sale, using savings from their other income sources to afford inputs (including labour). Similarly, they derive a small cash benefit from their animals. 'Middle' households also sell crops and livestock or livestock products. During the COVID-19 lockdown restrictions, the 'poor' and 'very poor' households are the ones who suffer the most impacts of food insecurity.

During interviews, key informants in the villages tended to use larger household sizes compared with those from other surveys such as the census. This was possibly due to key informants referring to family units rather than the stricter definition of household. These family units will certainly share some resources, including grants such as pensions and child grants, cultivated land (shared in terms of labour required and production) or the proceeds from casual labour. They are, therefore, used in the ensuing calculations on sources of food and income; these can be scaled to the appropriate household size from the census.

6.2.3 Highveld Open Access Mixed Income (ZAHMI) Livelihood Zone of Nkangala District

Wealth in this livelihood zone 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. Livestock ownership, especially cattle.

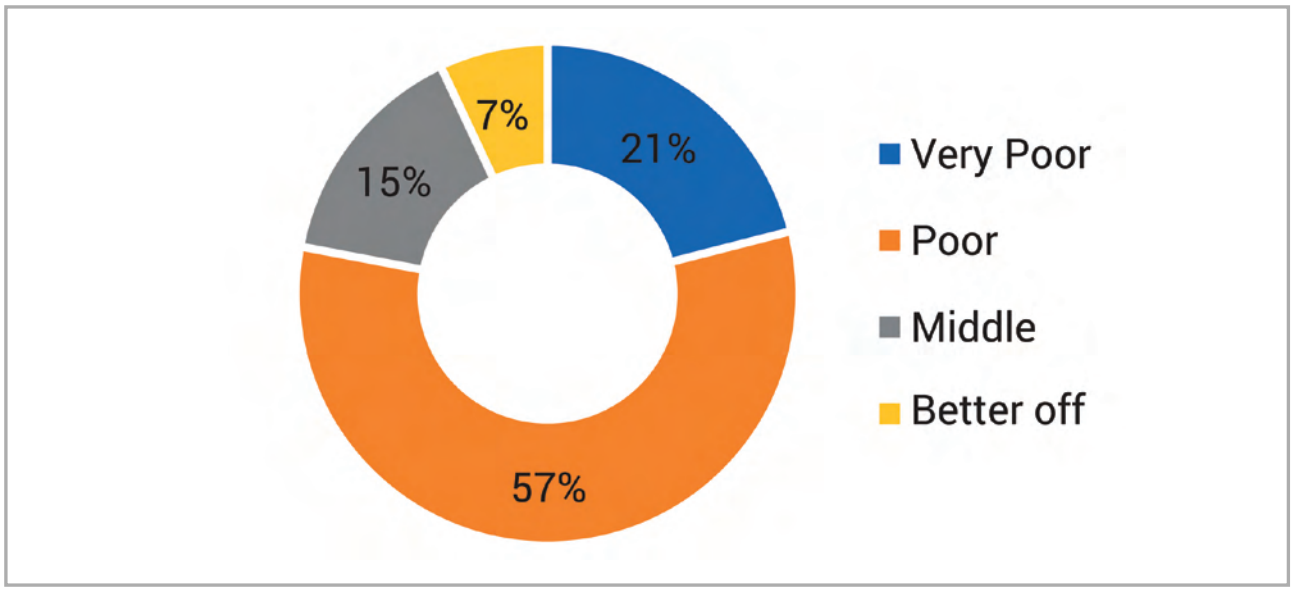


Figure 35: *Wealth breakdown in the Livelihood Zone (ZAHMI) (Source: HEA, Qualitative Output)*

The wealthiest households, described as the 'better-off', are those with permanent work, a salary, and an average income of almost half a million (Figure 35). 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'. 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 with 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 and income in ZABOL Zone of Ehlanzeni and Gert Sibande 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 18% and 27% of the food sources for the 'very poor' and 'poor' wealth groups. Food purchases contributed about 55% and 71% of the food needs for the 'middle' and 'better-off' households (Figure 36 and 37). 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 25% to 35% across the wealth groups. 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.

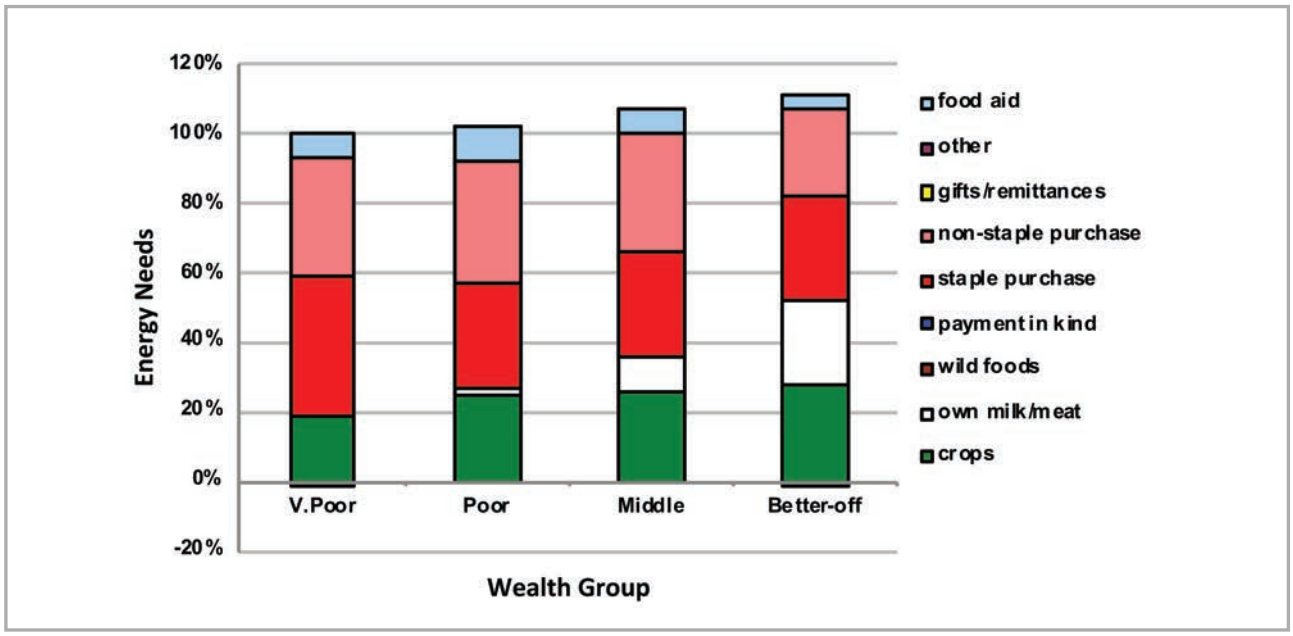


Figure 36: *Sources of food in ZABOL (expressed as percentage of minimum average food energy needs) for each wealth group (Source: HEA, Qualitative Output)*

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.

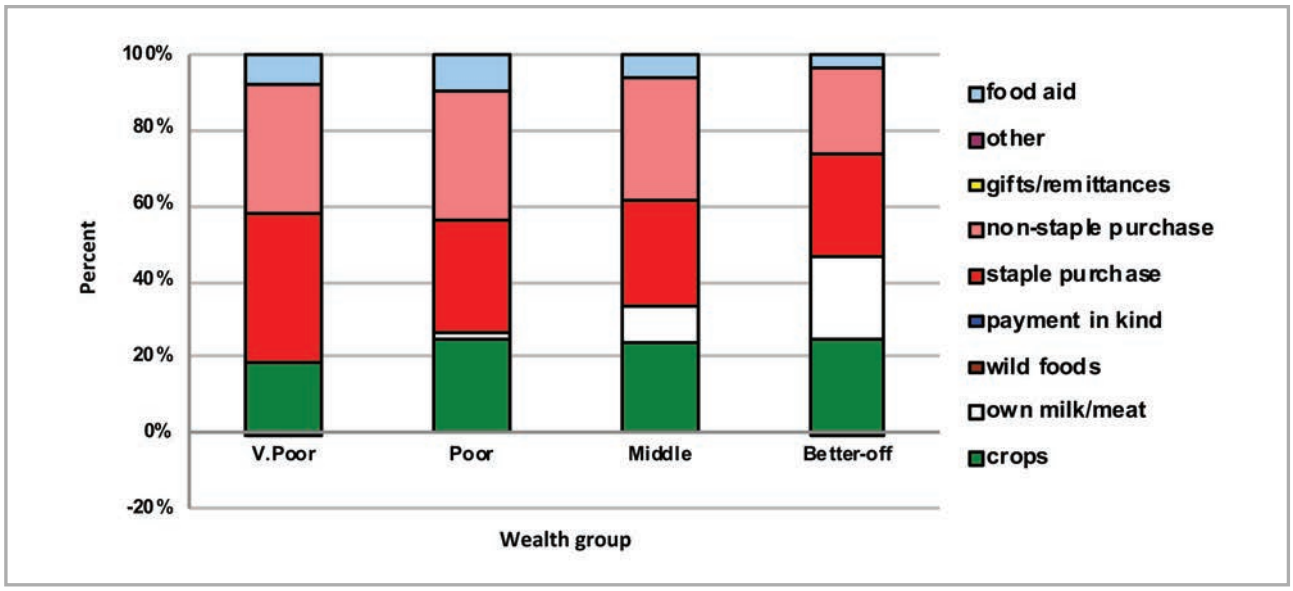


Figure 37: *Sources of food in ZABOL (expressed as percentage of overall total food energy needs) for each wealth group (Source: HEA, Qualitative Output)*

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

6.2.5 Gender analysis of who produces food in ZABOL Zone of Ehlanzeni and Gert Sibande districts

Policy makers recognise that youths and women represent a vast human resource potential in development, with its own specific problems, concerns, needs, and aspirations. They need to be promoted to ensure their participation, equity, and equality 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.

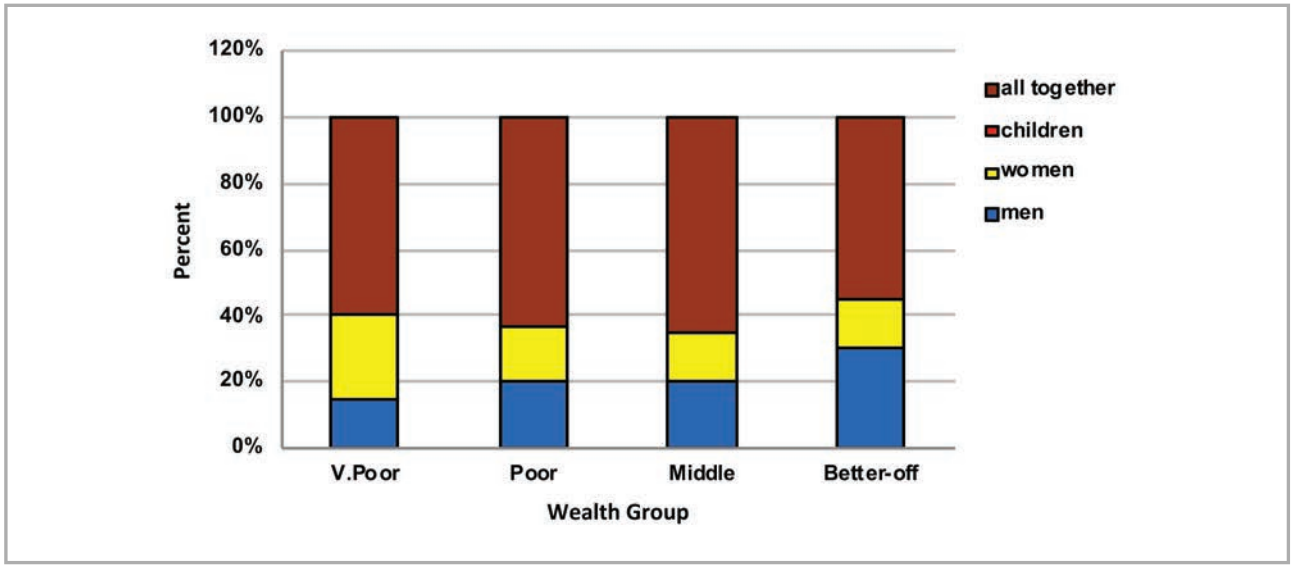


Figure 38: *Gender breakdown of who produces food in the zone for each wealth group (Source: HEA, Qualitative Output)*

The results indicated that men and women altogether contributed significantly to generate food. This was about 60% across all wealth groups. Women appear to contribute significantly to production of food among all wealth groups, ranging from 15% among 'better-off' to 25% among 'very poor' households (Figure 38). 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, crop production, boost agricultural yield, overall GDP and also lift 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 ZABOL Zone of Ehlanzeni and Gert Sibande districts

Cash incomes varied considerably across wealth groups, with the 'better-off' earning above R353 221 per annum, seven times as much as the 'very poor', who earned only R54 690 per annum. Figure 39 below 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).

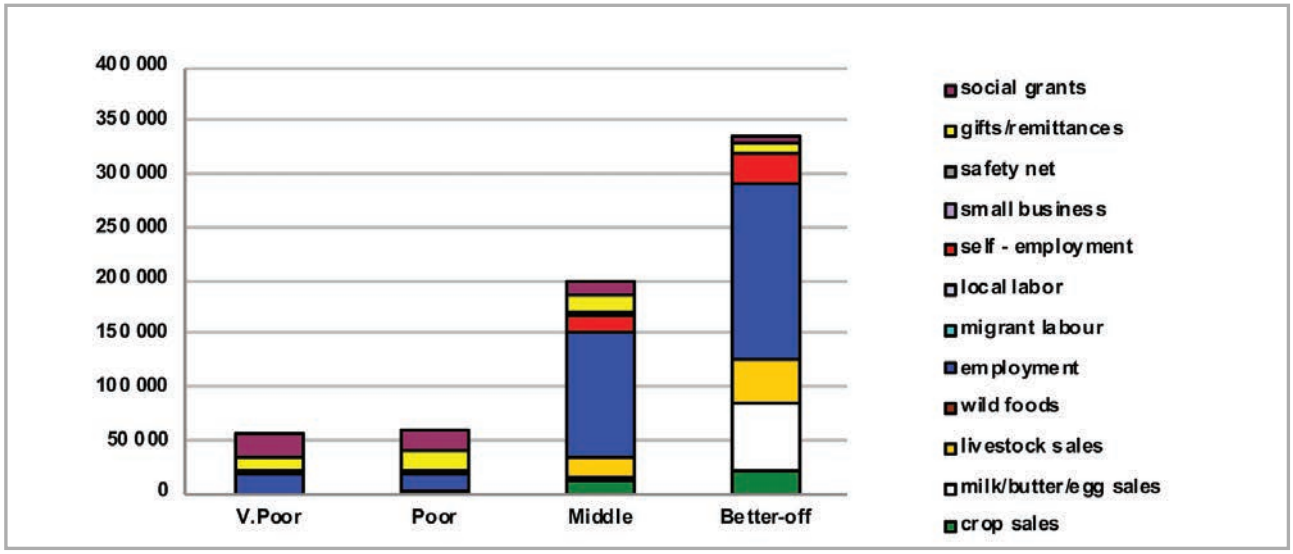


***Figure 39:** Sources of annual cash income by wealth group (Source: HEA, Qualitative Output)*

The main sources of cash incomes in the zone are 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.

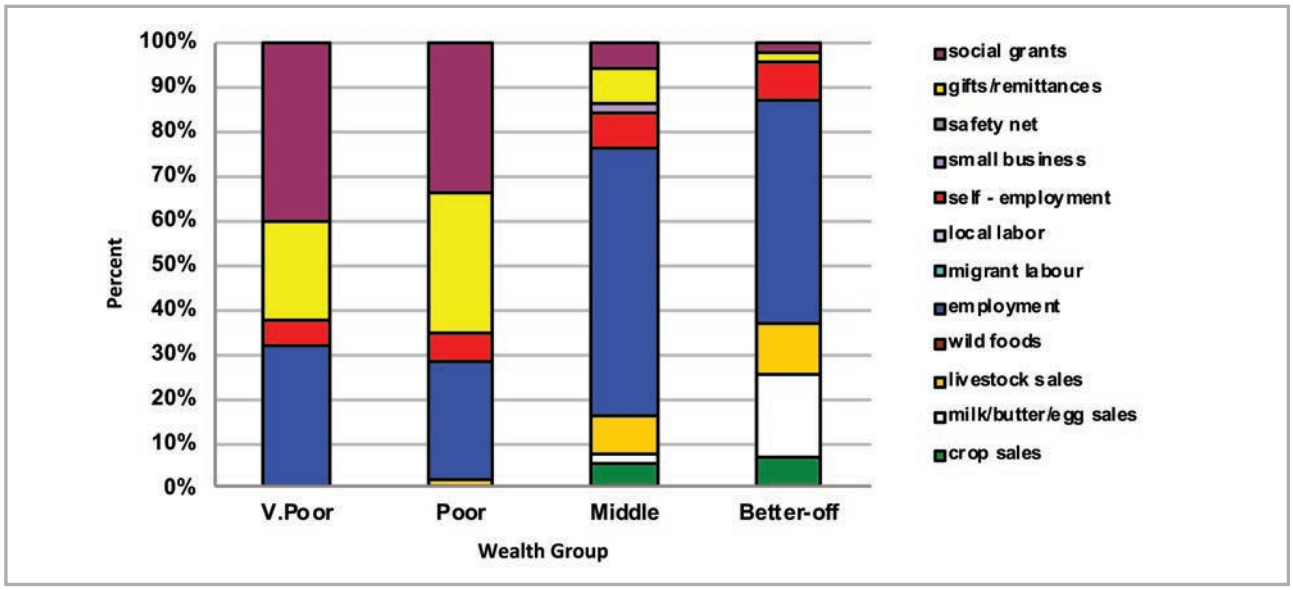


***Figure 40:** Sources of annual cash income as a percentage of total, by wealth group (Source: HEA, Qualitative Output)*

However, the point of this enquiry was to gain 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 40.

For the 'very poor' and 'poor', grants made up 35% and 32% of total cash income, respectively; the remainder was from casual labour (mostly domestic work, agricultural piece work, construction jobs, etc.) and self-employment (collecting natural products for sale, weaving, making bricks, etc.) (Figure 40). The 'poor' earn small amounts of income through livestock sales - usually goats, gifts/ remittances, and employment. This, coupled with a small income from the formal sector (R12 000 annually) was what distinguishes their livelihoods from that of the 'very poor'. The analysis showed that 'poor' households would lose up to 50 per cent 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 most of the population in this area.

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. '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 during any unforeseen event or crisis.

The earnings from livestock products are very low for the 'very poor' and 'poor' households, 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, namely: 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 and income in ZAHIC of Nkangala and Gert Sibande districts

Purchases were the largest source of people's food, contributing about 63% to 73% of minimum food energy needs. The contribution from staple food purchases decreases steadily as households get wealthier. Conversely, the contribution from non-staple food purchases increased with increasing wealth.

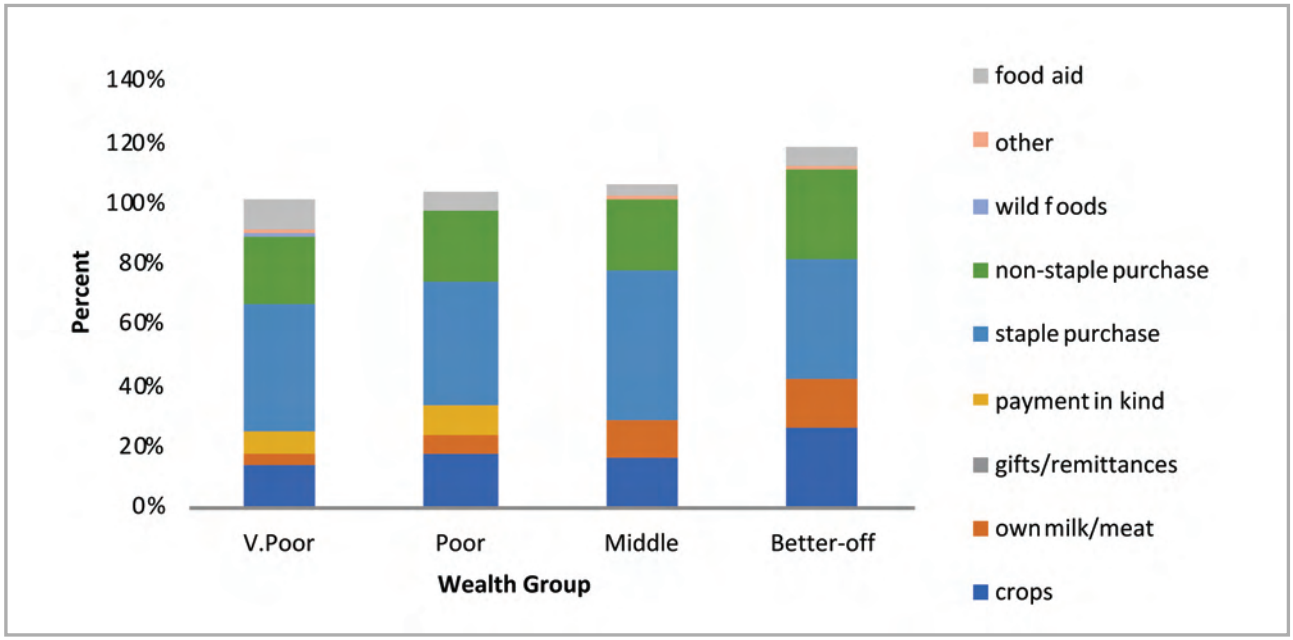


Figure 41: *Sources of food in ZAHIC (expressed as percentage of minimum average food energy needs) for each wealth group (Source: HEA, Qualitative Output)*

Most households and all wealth groups also consume food from their own crop production, although about 4% for the 'very poor' who lack the labour and capital to produce any significant quantities of their own food. (Figure 41 and 42) The 'better-off' and 'middle' have the highest contribution to their food energy from both staple and non-staple crops, at about 16% to 26% of their minimum needs, respectively. The analysis showed that about 63% and 64% 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.

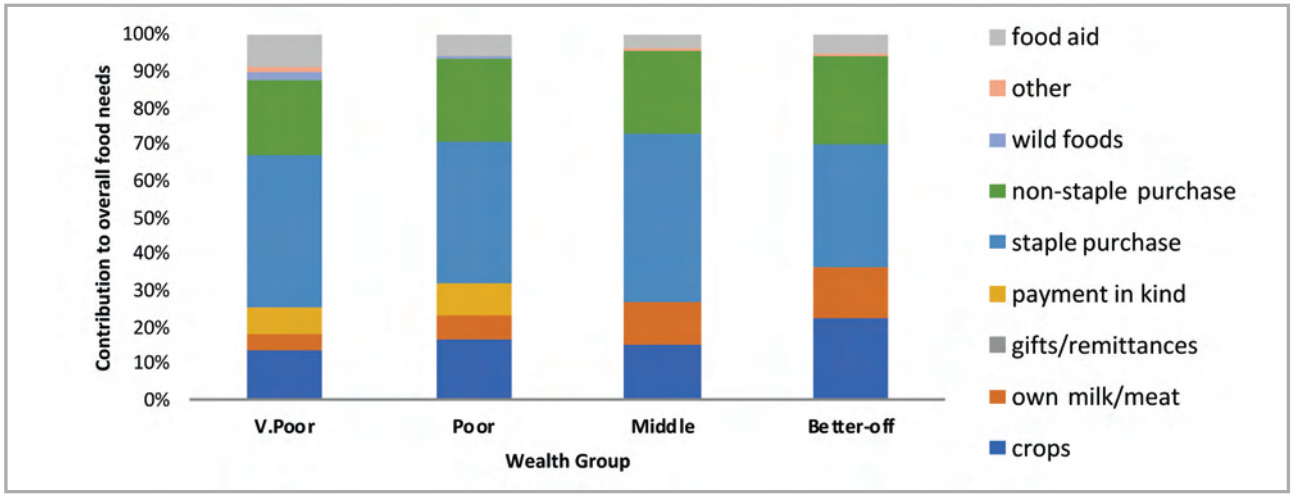


Figure 42: *Food source as contribution to the total (Source: HEA, Qualitative Output)*

Only the 'middle' and 'better-off' households obtain substantial food from their livestock products; this is usually from cow 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 participatory and inclusive approach in improving access to food and income in the communities. Hence there is a need to promote and ensure 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.

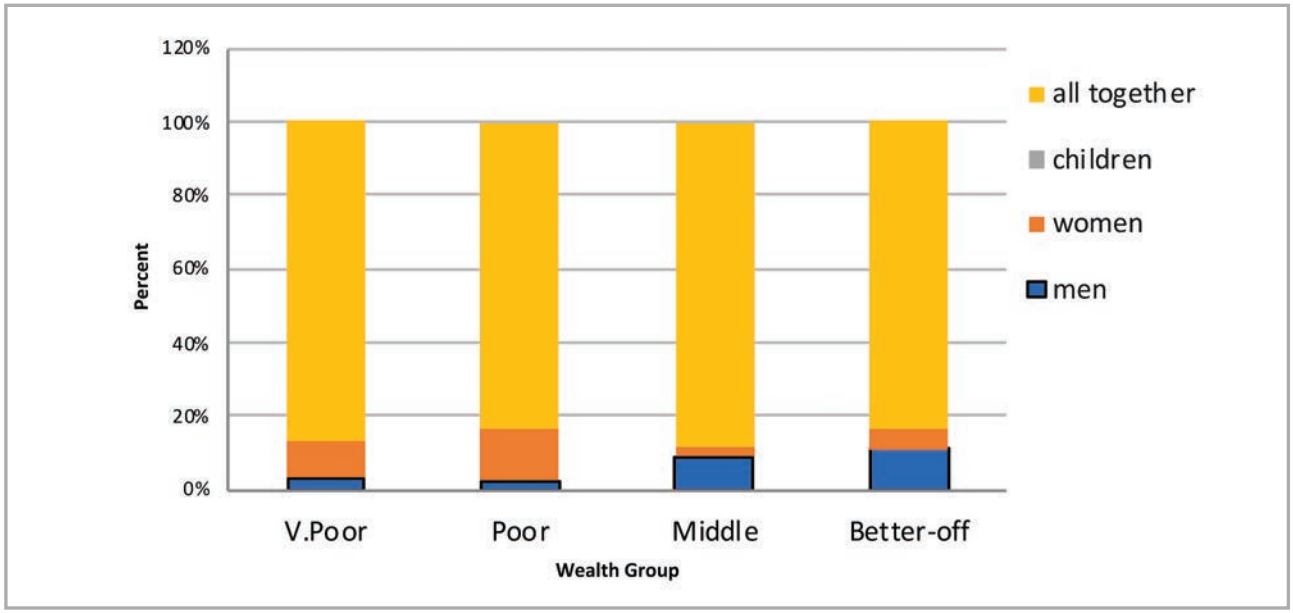


Figure 43: *Gender breakdown of who produces food in the zone for each wealth group (Source: HEA, Qualitative Output)*

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 (Figure 43). Women appeared to contribute significantly to 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. These include HIV and AIDS, poor youth participation in 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 scale of economic activities, crop production, boost agricultural yield, overall GDP and also lift a significant proportion of people out of poverty.

6.2.9 Sources of Cash in ZAHIC Zone of Nkangala and Gert Sibande districts

Cash incomes vary considerably across wealth groups, with the 'better-off' earning R386 284 per annum, more than ten times as much as the 'very poor', who earn R36 194 per annum. Figure 44 shows this distribution as the bars represent wealth groups and wealth groups.

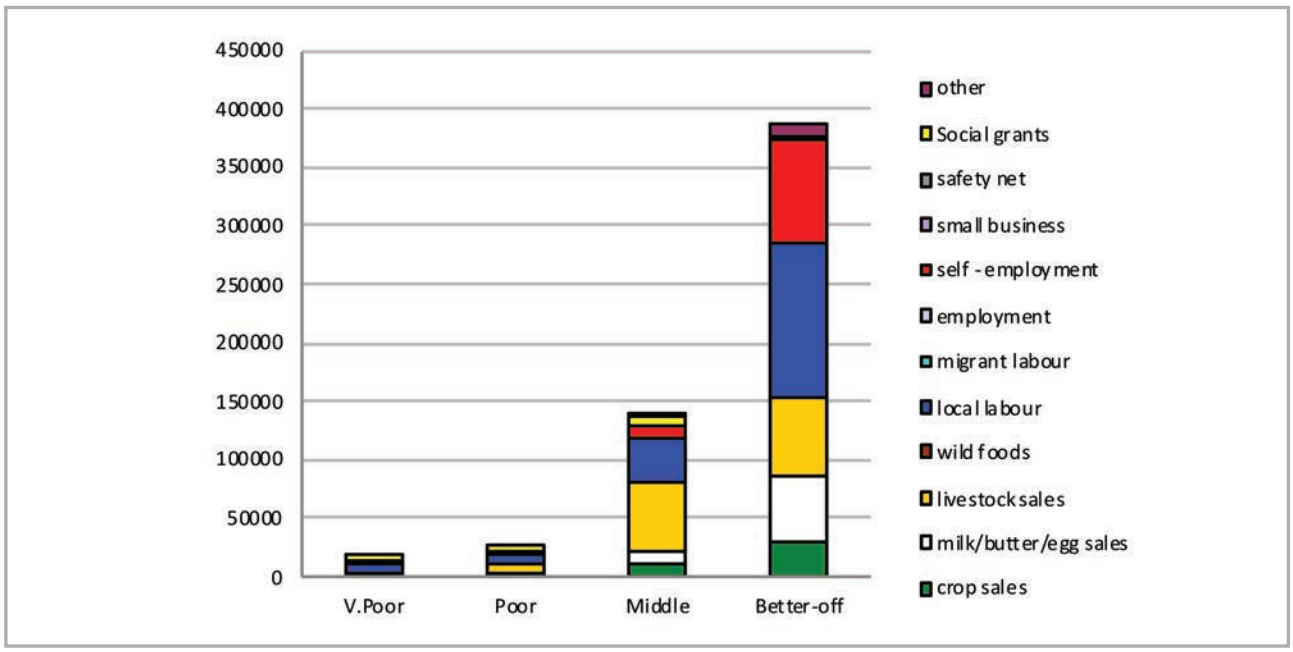


Figure 44: *Sources of annual cash income by wealth group in ZAHIC (Source: HEA, Qualitative Output)*

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.

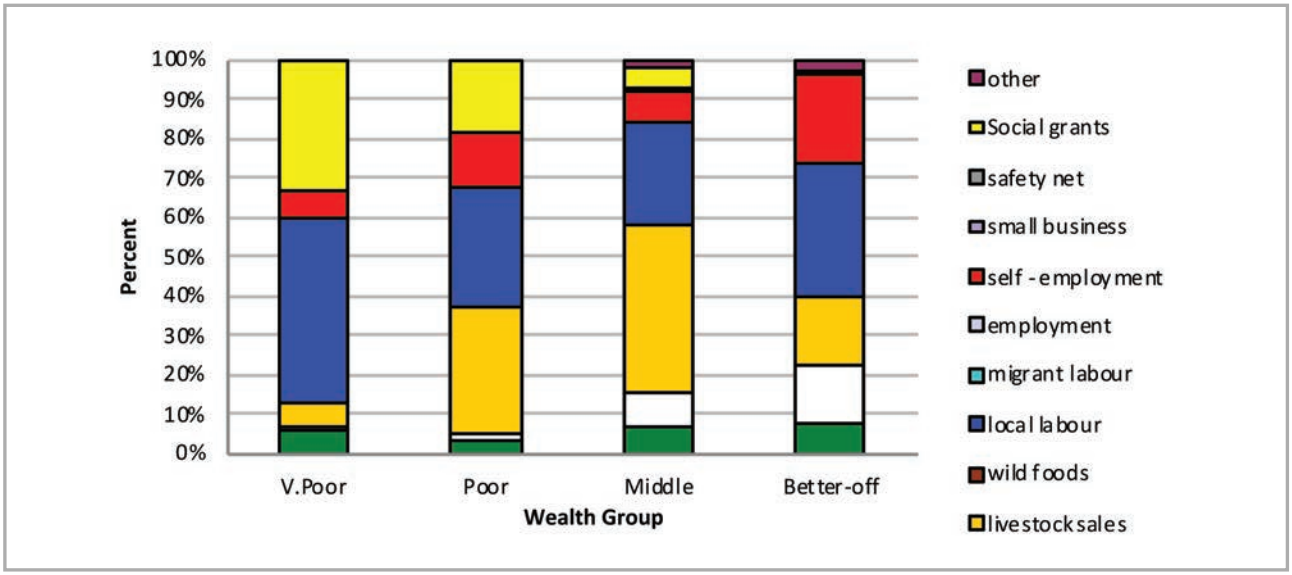


Figure 45: *Sources of annual cash income as a percentage of total, by wealth group (Source: HEA, Qualitative Output)*

However, the point of this enquiry was to gain 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 the graph in Figure 45.

For the 'very poor' and 'poor', grants make up 35% and 20% of total cash income, respectively; with the remainder 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.). The 'poor', 'middle' and 'better-off' earn some of their cash from animal sales and from petty trading or a small business (Figure 45).

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 R386 284 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 number of cows that are milked compared with those likely to be lactating is low and this is due to several 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 and income in ZAHMI in Nkangala District

Despite the good rainfall and fertile soils, purchases still make up the largest portion of people's sources of food. Food purchases contribute 61% to 80% of food energy needs. Conversely, the contribution to food energy of non- staple food purchases increased with increasing wealth, from 23% for the 'very poor', to 40% for the 'better-off'.

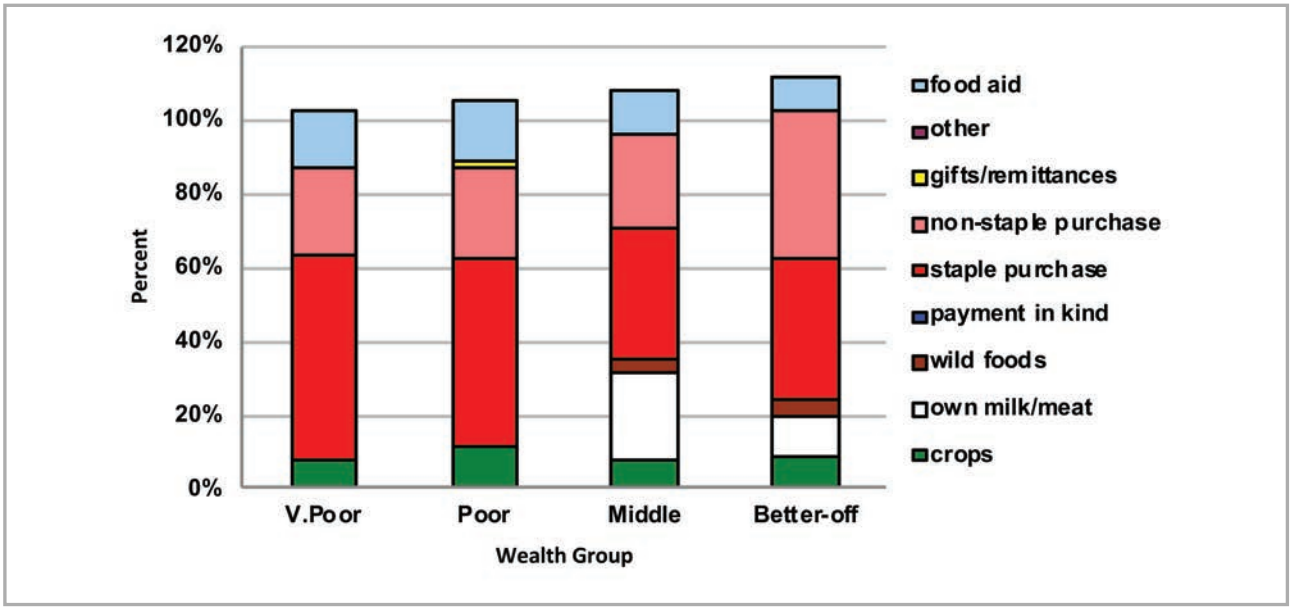


Figure 46: *Sources of food in ZAHMI (expressed as percentage of minimum average food energy needs) for each wealth group (Source: HEA, Qualitative Output)*

The contribution to food energy needs from own crop production increased with increasing wealth, from 8% for the 'very poor' to 12% in the zone. The breakdown into staple and non-staple did not follow any pattern with wealth; the contribution from non-staple crops being about 23% to 40% (Figure 46). Yields in the zone were low, given the fertility and land capability - 'very poor' and 'poor' households obtain only 800kg/Ha, this rose to 1,200kg/Ha for the 'middle' and 1,800kg/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 (11% and 24%, respectively); this was usually from cow milk and occasional slaughter for meat. Dairy production in this zone did not commensurate with herd sizes and livestock ownership. In general, a fraction of lactating cows (about 1 in 8) was milked for consumption.

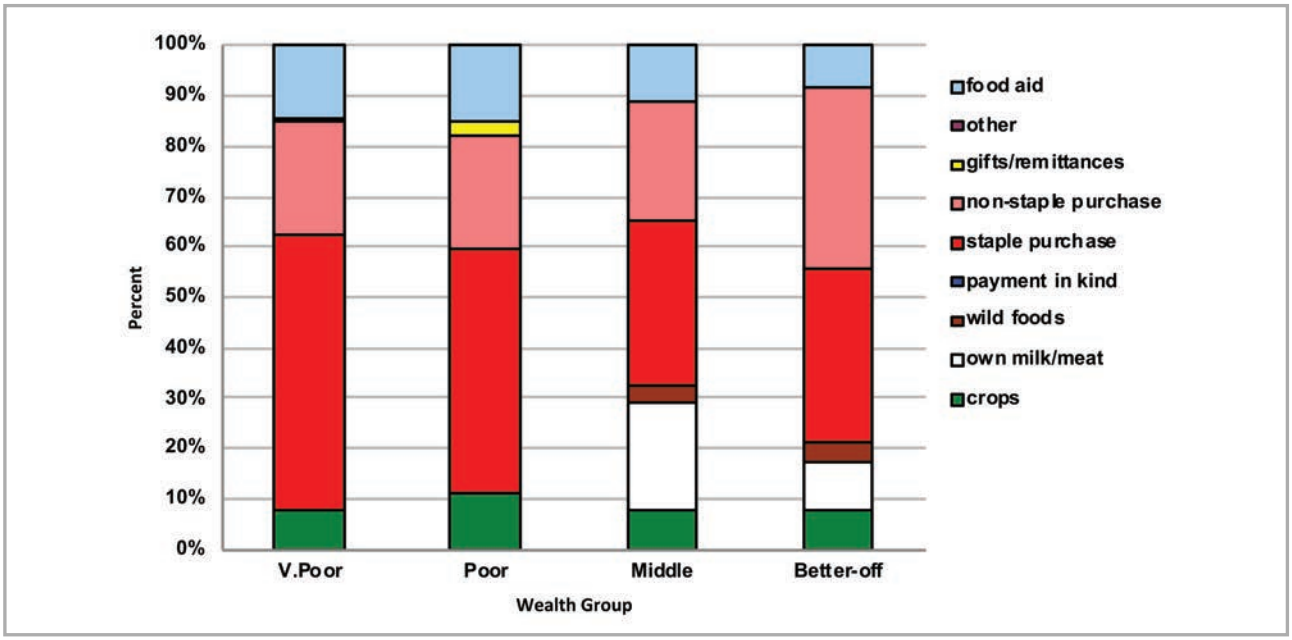


Figure 47: *Sources of food as overall to the total by wealth breakdown (Source: HEA, Qualitative Output)*

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 ZAHMI of Nkangala District

Cash incomes varied considerably across wealth groups, with the 'better-off' earning R1 408 723 per annum, twenty-five times as much as the 'very poor', who earn only R22 285 per annum. Figure 48 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.

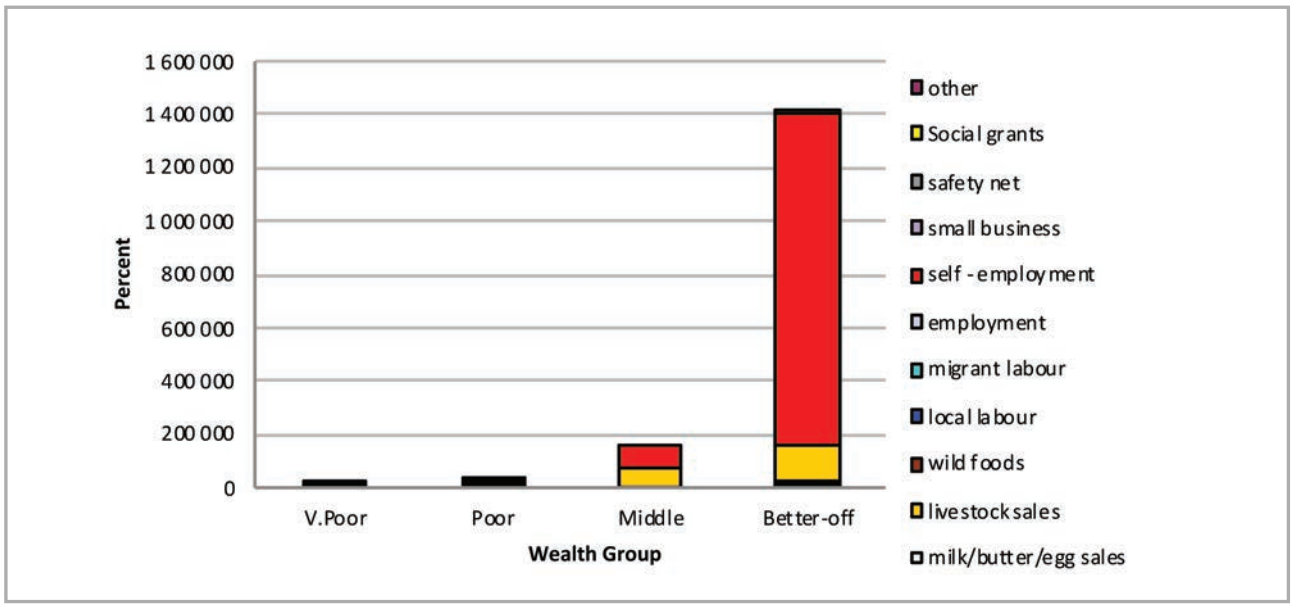


Figure 48: *Sources of annual cash income by wealth group in ZAHMI (Source: HEA, Qualitative Output)*

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 49.

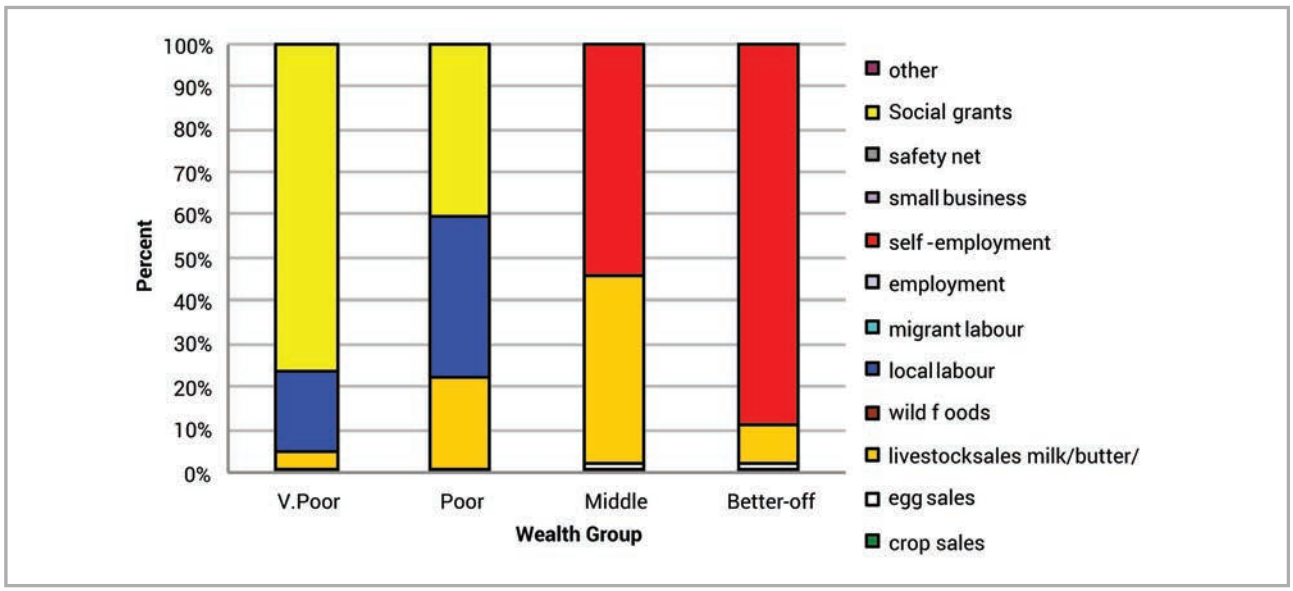


Figure 49: *Sources of annual cash income as a percentage of total, by wealth group in ZAHMI (Source: HEA, Qualitative Output)*

For the 'very poor' and 'poor', grants make up 75% and 40% of total cash income, respectively; the remainder 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 lock downs, leaving the 'poor' and 'very poor' hopeless and food insecure. The 'poor' earn small amounts of income through livestock sales - usually goats (22%) and local labour (32%), and remittances. This, coupled with a small income from the formal sector annually and self-employment, is what distinguishes their livelihoods from that of the 'very poor'.The 'middle' and 'better-off' gain their cash from self-employment (R83 398 and R1 247 892 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 most 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 to 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.

Additional response strategies households may engage in under stress are 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 potential to improve household production in the study area. 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 37: Access to agricultural extension services disaggregated according to sex, age, and district

		Access to extension service			
		No access		Access	
		N	Row N %	N	Row N %
Sex of Household Head	Male	640	96	22	4
	Female	617	97	22	3
Household head age	18-24	46	98	1	2
	25-34	189	99	2	1
	35-44	245	98	6	2
	45-54	285	97	10	3
	55-64	237	93	16	7
	65+	248	96	9	4
District	Ehlanzeni	532	95	25	5
	Gert Sibande	394	97	11	3
	Nkangala	335	98	8	2

Table 37 shows that access to agriculture extension services is very limited across all the three districts with Ehlanzeni District reporting only 5% access to extension services. The 18-24 years age group reported the least (2%) access to agriculture extension services and, generally, inaccessibility to extension services was high across all the age groups. The Department of Agriculture, Land Reform and Rural Development), therefore, needs to take urgent steps to address the problem of provision of agriculture extension services in Mpumalanga Province.

6.4 Access to Markets

The availability and access to markets by households in Mpumalanga Province is relatively good with all the districts reporting over 90% accessibility to markets (Table 38) except for Ehlanzeni which had 89%. The 18-24 age group reported highest access to markets (100%), probably because these are the most mobile group of the population. All the other age groups reported over 90% access to markets except for those above 65 years old who reported 88% accessibility to markets. This is also attributable to the limited mobility due to advanced age.

Table 38: Access to markets by households in Mpumalanga Province

		Market Access			
		No		Yes	
		N	Row N %	N	Row N %
Sex of Household Head	Male	44	7	599	93
	Female	53	9	592	91
Household head age	18-24	0	0	44	100
	25-34	7	4	172	96
	35-44	18	8	223	92
	45-54	18	7	272	93
	55-64	23	10	234	90
	65+	31	12	238	88
District	Ehlanzeni	62	11	505	89
	Gert Sibande	22	6	360	94
	Nkangala	14	4	329	96

6.5 Access to Road Infrastructure

Access to infrastructure such as roads is critical in enhancing food and nutrition security since most of the food is bought from markets. Both females and males reported high levels (91%) access to roads with the 18-24 age category having 100% access (Table 39). Across the three districts, road access was relatively good with the highest (96%) being recorded in Nkangala, whilst the least was reported in Ehlanzeni (87%).

Table 39: Access to road infrastructure by households in Mpumalanga Province

		Access to Road Infrastructure			
		No		Yes	
		N	Row N %	N	Row N %
Sex of Household Head	Male	58	9	585	91
	Female	56	9	589	91
Household head age	18-24	5	12	39	88
	25-34	13	8	167	92
	35-44	15	6	226	94
	45-54	29	10	262	90
	55-64	23	9	234	91
	65+	29	11	238	89
District	Ehlanzeni	74	13	494	87
	Gert Sibande	27	7	355	93
	Nkangala	14	4	328	96

Discussion

Seasonal variation

The results depicted by the seasonal calendar developed from HEA focus group discussions in Mpumalanga 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 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 have been reported in other studies such as Phokele and Sylvester (2012). Previous studies in Mpumalanga Province have reported that rainfall is highly seasonal with 95% occurring between October and March (M'marete, 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 three districts of Mpumalanga Province. 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 less than 500m2 hectares, which is primarily used for residential purposes. This is buttressed by Nieuwoudt and Groenewald (2003) who noted that land holdings in these former homelands in South Africa 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 as a country, 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 Mpumalanga 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. The 18-24 age group reported the least land access (<5%) across the three 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. In Mpumalanga Province, there is a relatively fair land ownership across the gender groups and females have relatively higher land access than men.

Agriculture production systems

Both crop and livestock production are reportedly commonly practised in Mpumalanga Province to provide income. However, empirical evidence from the Household Economic Approach (HEA) argues that much of the food is provided through income from self-employment, livestock sales, and social grants. The self-employment activities include activities such as small-scale mining, crop, and livestock sales as well as formal employment.

7 Household Food and Nutrition Security 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. Correlation analyses are 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.

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. The average HFIAS score for Mpumalanga was 9.8, with a range of 0 to 27.

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 eats undesirable foods, and/or rarely or sometimes reduces 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 50 presents the proportion of the prevalence of food insecurity among the sampled households. The overall results showed that close to three quarters of the households (71%) in Mpumalanga experienced food insecurity, with only 29% found to be food secure. Figure 50 shows that 22.2% of the households were severely food insecure, 30.2% of the surveyed households were moderately food insecure, and 18.5% of the households were mildly food insecure. Overall, the findings of this study differ from the findings of the GHS 2020 which found more proportions of food secure households than the food insecure ones (Stats SA, 2021). However, this household food security situation is not strange bearing in mind that the data was collected during the years of COVID19 pandemic which may have severely impacted on households' purchasing power and thus increased the proportions of food insecure households. 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., 2016; Ngidi, 2017).

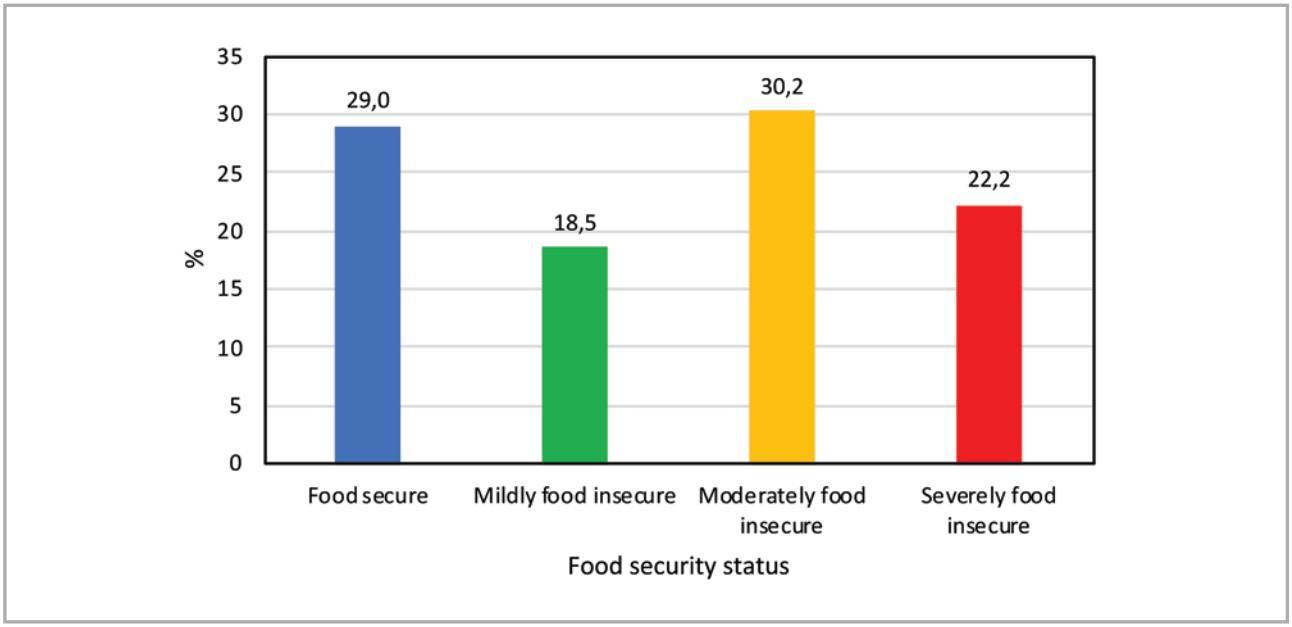


Figure 50: *The categorised food security situation, using HFIAS*

Table 40 shows that the food security status of households was found to be 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 female-headed households, with 34% of the male-headed households found to be food secure, compared to only 24% of female-headed households in this category. Similarly, Negesse et al. (2020), also found that severity of food insecurity among female-headed households in Ethiopia was higher as compared with their men counterparts. In any category of the HFIAS, but mildly food insecure, female-headed households experienced higher levels of food insecurity. Severe food insecurity was experienced by 21% of the male-headed households compared to 23% of the female-headed households that fell within the same category. Approximately 26% and 34% of male-headed and female-headed households experienced moderate food insecurity, respectively. About 19% and 18% of male- headed and female-headed households experienced mild food insecurity, respectively (Figure 51).

Table 40: 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 the Household Head	Male	230	34	135	19	193	26	149	21
	Female	157	24	123	18	239	34	167	23
Household head age	18-24	13	28	13	28	10	22	11	22
	25-34	62	31	38	18	61	28	45	23
	35-44	83	31	49	19	86	31	55	19
	45-54	86	29	57	18	108	33	67	21
	55-64	67	28	47	16	84	30	72	26
	65+	72	26	52	20	81	30	65	23
District	Ehlanzeni	158	29	116	21	161	29	114	20
	Gert Sibande	105	26	73	18	148	36	85	20
	Nkangala	125	31	69	15	124	28	117	26

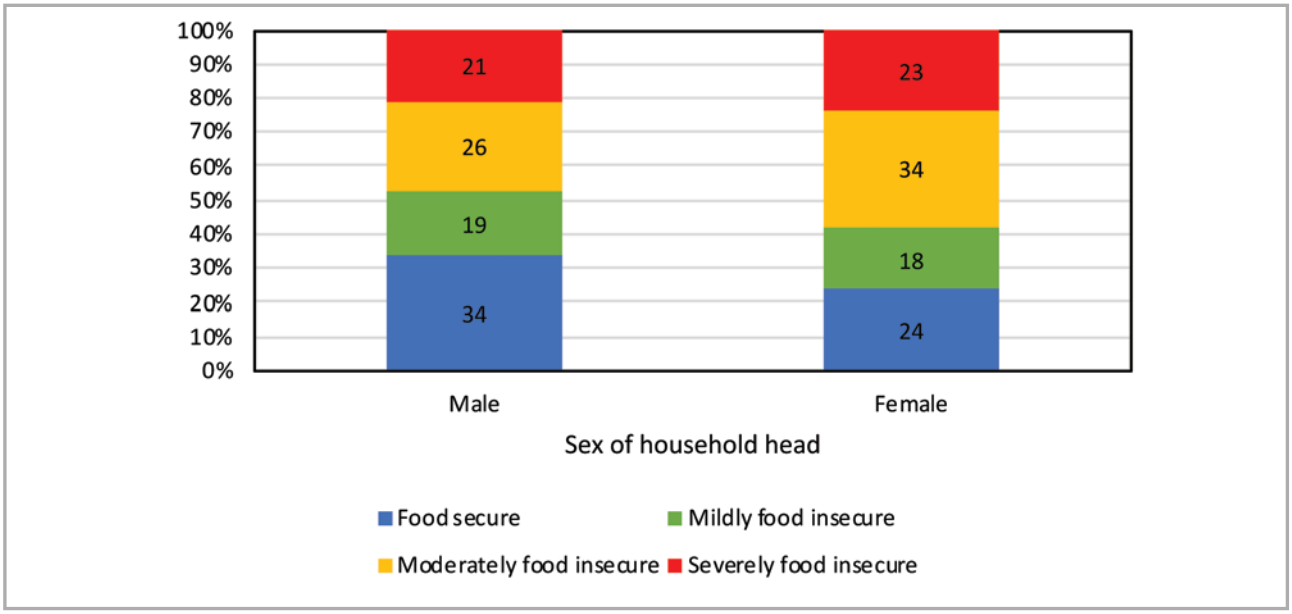


Figure 51: *Food security status by sex of household head*

Table 40 and Figure 52 show that households headed by the 25-34 and 35-44 years age groups had the highest proportion of those who were food secure, both at 31%. They were followed by those households headed by the 45-54 years age group, with 29% of the households headed by this age group found to be food secure. The least food secure age group was found to be the 65 years and older group. The 55-64 years age group was found to have been the most severe food-insecure, with 29% of the households headed by this age group found to be severely food insecure.

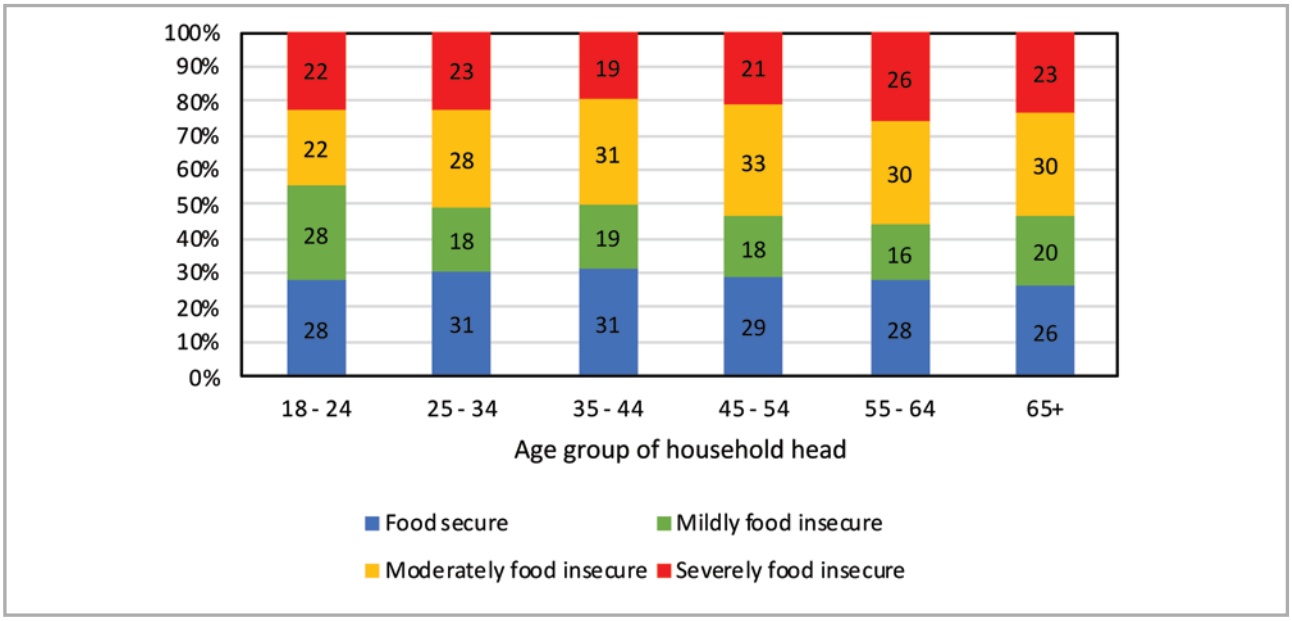


Figure 52: *Food security status by age group of household head*

Table 40 and Figure 53 show that the Nkangala District had the highest proportion of households that were food secure (36%), followed by the Ehlanzeni and Gert Sibande districts with both having 28% of the households that are food secure. Ironically, the Nkangala District also had the highest proportion of households experiencing severe food insecurity. About 28% of the households in the Nkangala District were severely food insecure. This was followed by households from the Ehlanzeni District who had 17% of the households were severely food insecure. About 16% of the Gert Sibande District also experienced severe food insecurity. Moderate food insecurity was largely experienced by households from the Gert Sibande District where 37% of the households were moderately food insecure.

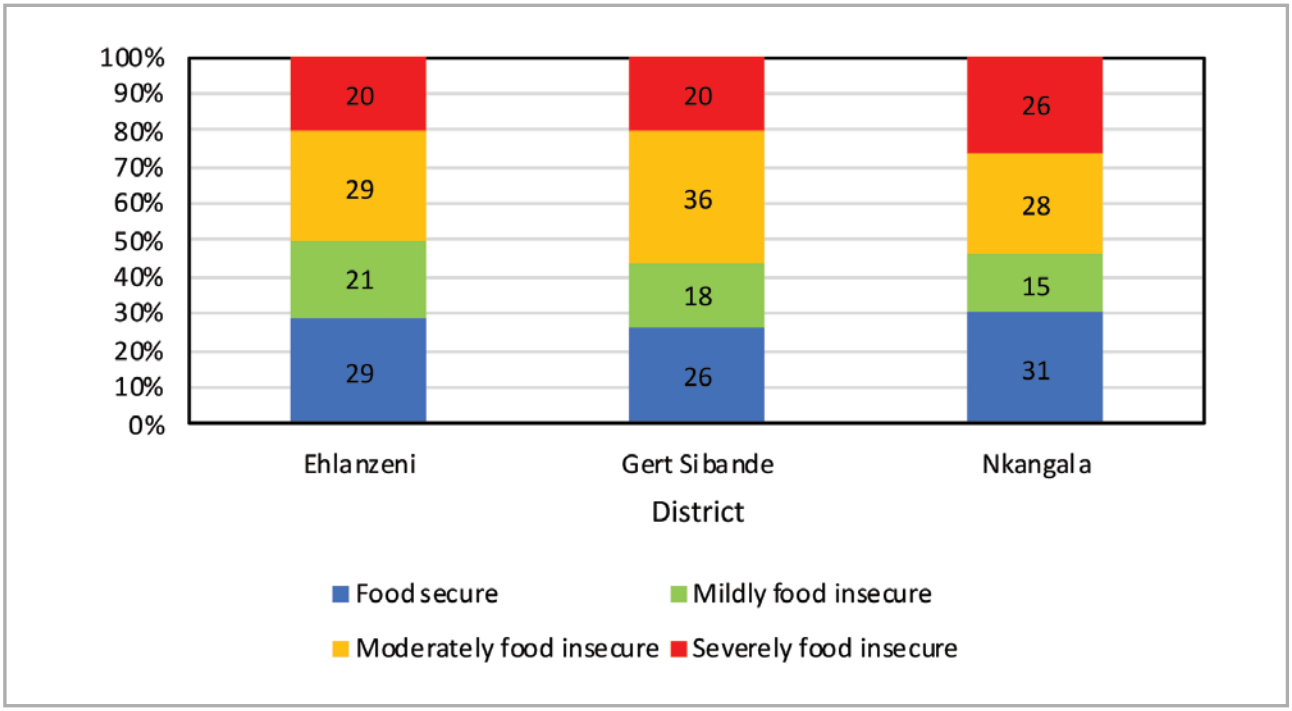


Figure 53: *Food security status by district*

7.2 Household Hunger Situation

The Household Hunger Scale (HHS) is a household food deprivation scale that is derived from selected HFIAS questions for use mainly in situations of high food insecurity levels. Figure 54 presents the results of the HHS scale, showing that most of the sampled households experienced little to no hunger (71.8%). About 20.6% of the households and 7.7%, respectively, experienced moderate hunger and severe hunger. 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 Mpumalanga.

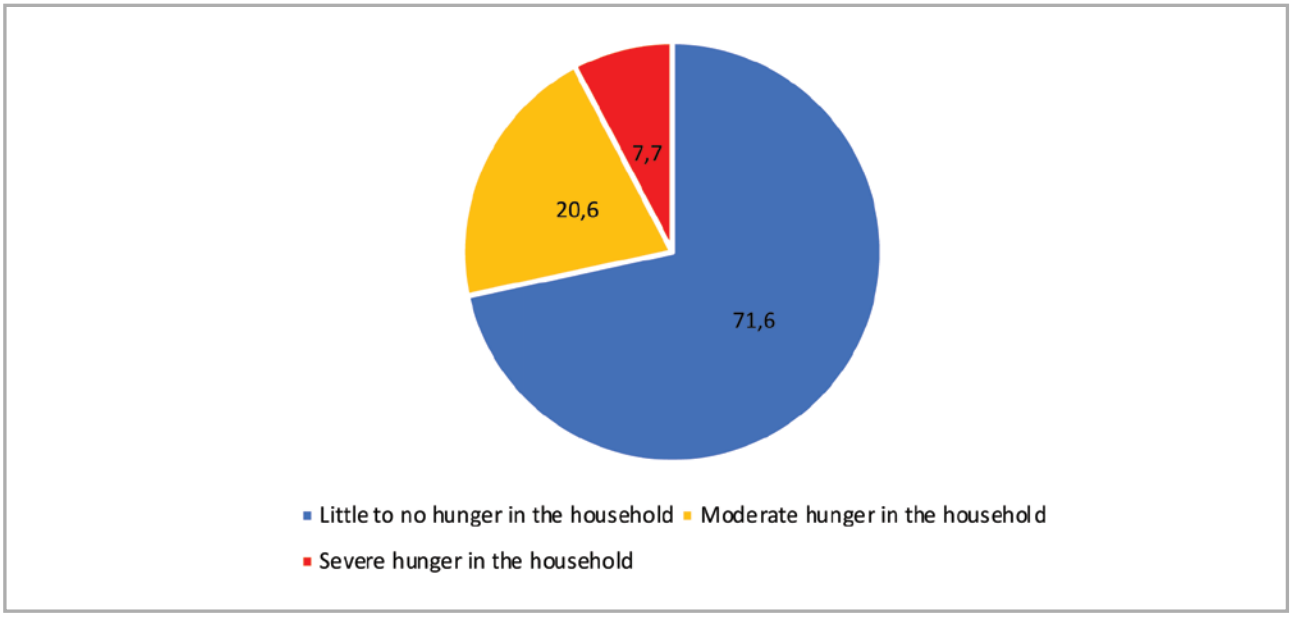


Figure 54: *Hunger experiences of households in Mpumalanga Province*

Table 41 presents the hunger status of households by sex, age, and district. Table 41 and Figure 55 show that the hunger status generally did not significantly differ between male-headed and female-headed households across all the categories of the HHS.

Table 41: 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	583	73	148	18	65	8
	Female	525	70	177	23	57	7
Household head age	18-24	34	69	14	26	3	5
	25-34	163	71	52	23	12	6
	35-44	219	73	58	19	27	8
	45-54	250	72	76	21	24	7
	55-64	214	72	54	17	32	11
	65+	217	70	71	23	24	7
District	Ehlanzeni	439	72	121	20	47	8
	Gert Sibande	337	75	87	18	34	7
	Nkangala	333	68	120	24	41	8

Table 41 and Figure 56 indicate that 73% of the male-headed households experienced little to no hunger, compared to 70% of the female-headed households. The proportion of female-headed households (23%) was higher than that of male-headed (18%) in the moderate hunger category. Severe hunger in the household was marginally higher among male-headed (8%) than among female-headed households (7%).

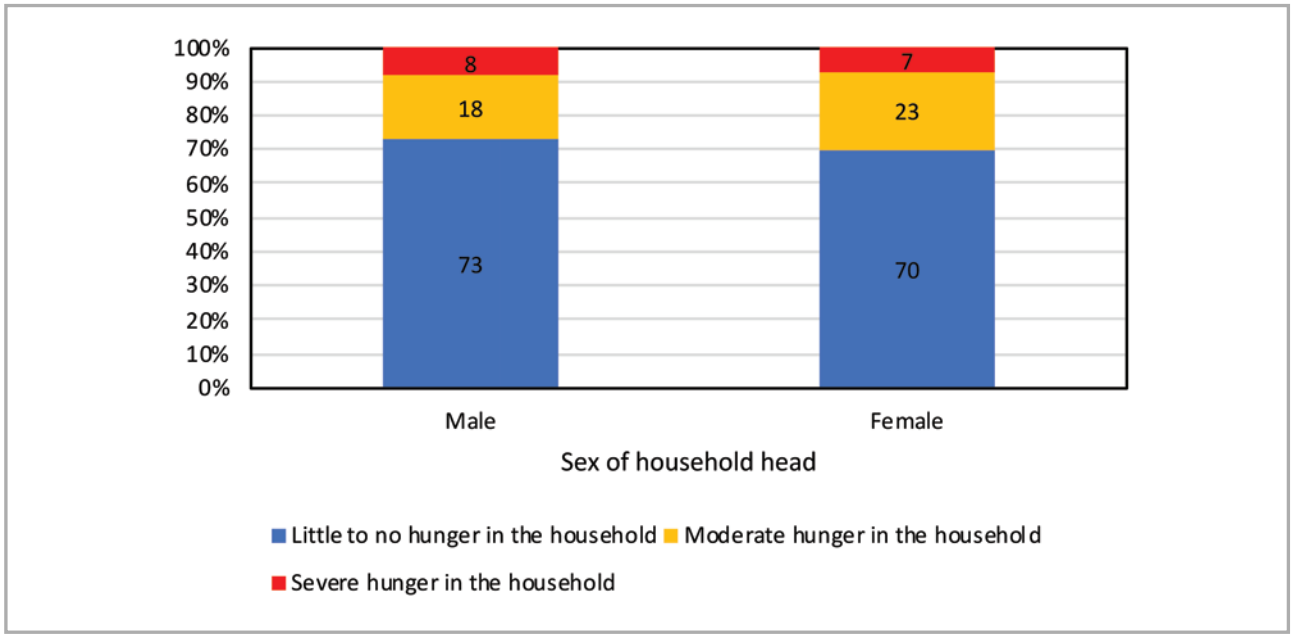


Figure 55: *Household hunger status by sex of household head*

Households in the age group of 35-44 years experienced relatively more hunger compared to the other age groups, with the age group of 18-24 years being the most food-secure group (Figure 56). Age group 65+ slightly experienced more severe food insecurity as well compared to other age groups.

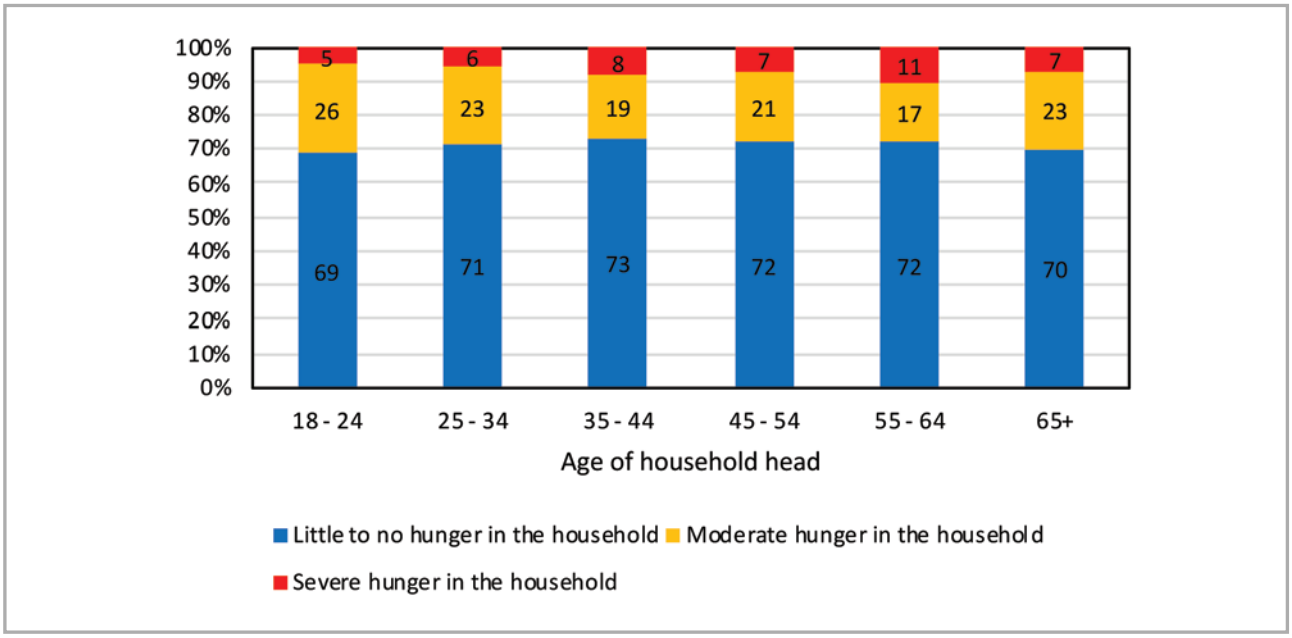


Figure 56: *Household hunger status by age group of household head*

There were minor variations in the hunger status of households across the three districts in Mpumalanga. The Gert Sibande District was the most food-secure district with 75% of the households found to have experienced little to no hunger. This was followed by Ehlanzeni District with 72% of the households found to have experienced little to no hunger. In terms of the HHS, the Nkangala District was slightly the least food secure, with 68% of the households experiencing hunger compared to others. More households in the Nkangala District (24%) also experienced moderate levels of hunger compared to the other two districts (Figure 57). Overall, there were minor differences in the proportion of households who experienced severe hunger in the three districts.

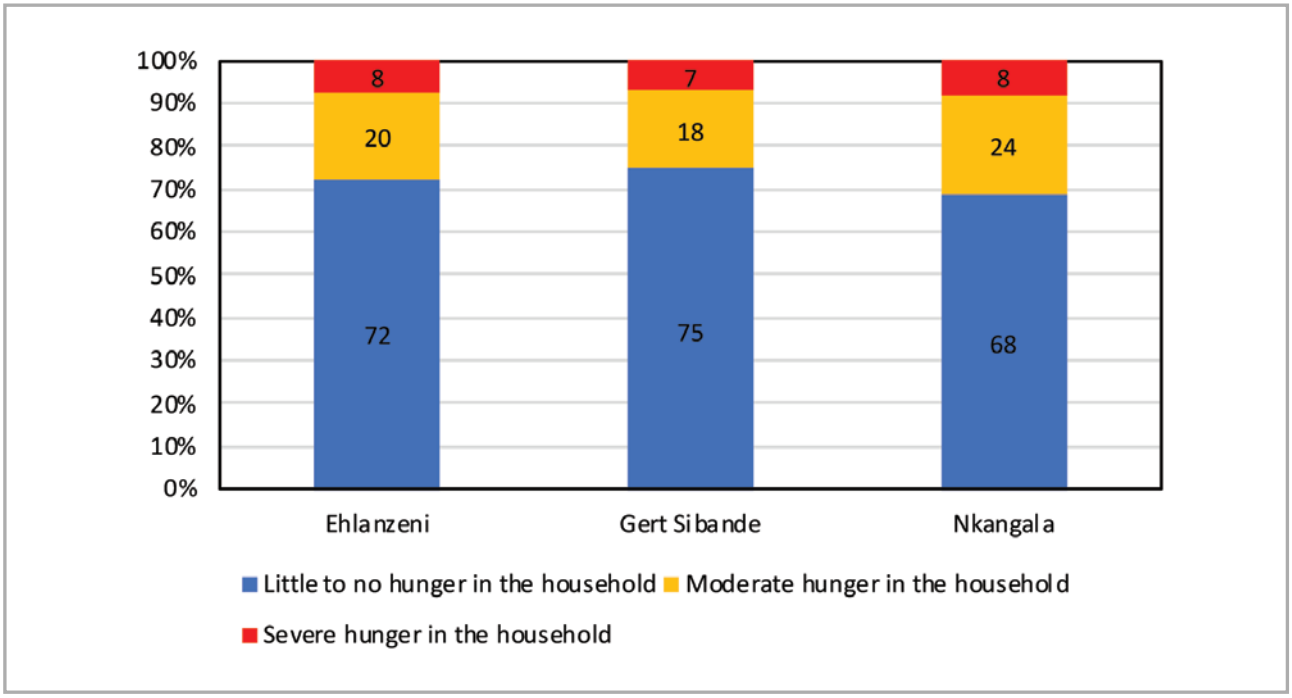


Figure 57: *Household hunger status by district*

7.3 Household Dietary Diversity Score (HDDS)

HDDS measures the economic ability of a household to access a variety of foods (Kennedy, 2009). 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. The food items were categorized into 12 different food groups.

Figure 58 shows that on average, the households in Mpumalanga consumed more than 7 out of 12 food groups, which suggests above-average dietary diversity levels. Using the cut-offs suggested by Kennedy (2009), 84% of households consumed highly diverse diets (more or equal to 6 food groups) whilst 13% and 3% of the households consumed medium dietary diversity (4-5 food groups) and low diverse diets (less or equal to 3 food groups), respectively.

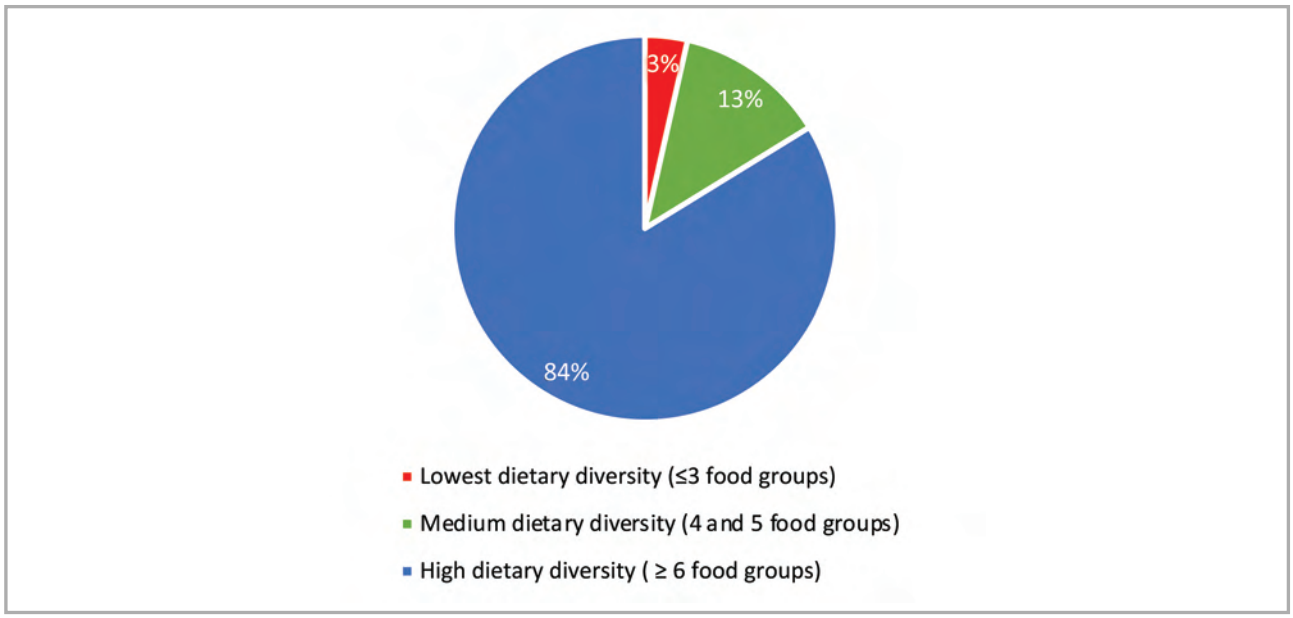


Figure 58: *Household Dietary Diversity Scores*

The results in Table 42 show that 3% of the male-headed households had the lowest dietary diversity, compared to 2% of the female-headed households. About 79% of the male-headed households consumed the highest dietary diversity compared to 88% of the female-headed households. Concluding within the context of this tool, these results generally suggest that female-headed households have better access to diversified food compared to male-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 18-24 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 45-54 years were the ones that largely consumed the lowest dietary diversity, followed by household heads within the age group of 18-24 and 55-64. In general, results from all districts but the Nkangala showed that the majority (more than 80%) consumed the highest dietary diversity. These results should be taken with caution because with 24-hour recall it is possible to find the situation looking good in terms of food variety simply because on the previous day it was pension day.

Table 42: Household Dietary Diversity Scores

		Lowest dietary diversity (≤ 3 food groups)		Medium dietary diversity (4 and 5 food groups)		High dietary diversity (≥ 6 food groups)	
		N	Row N %	N	Row N %	N	Row N %
1.2 Is __ a male or a female? Person 1	Male	28	3	115	13	663	83
	Female	30	4	97	12	648	84
household head age	18-24	3	5	6	11	43	84
	25-34	8	4	20	9	201	87
	35-44	10	3	49	15	247	82
	45-54	15	4	56	15	287	82
	55-64	13	4	31	9	261	87
	65+	9	3	49	14	262	83
District	Ehlanzeni	15	2	65	10	532	87
	Gert Sibande	15	3	70	14	385	83
	Nkangala	28	5	78	15	397	79

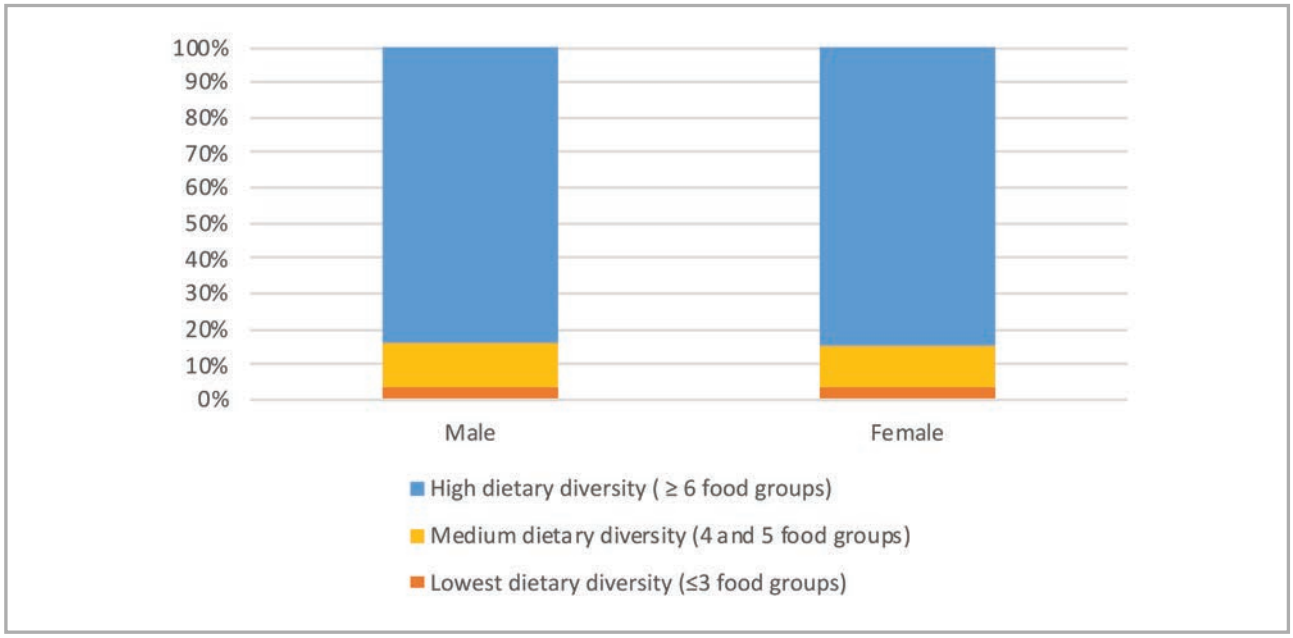


Figure 59: *Dietary Diversity Score category by sex of household*

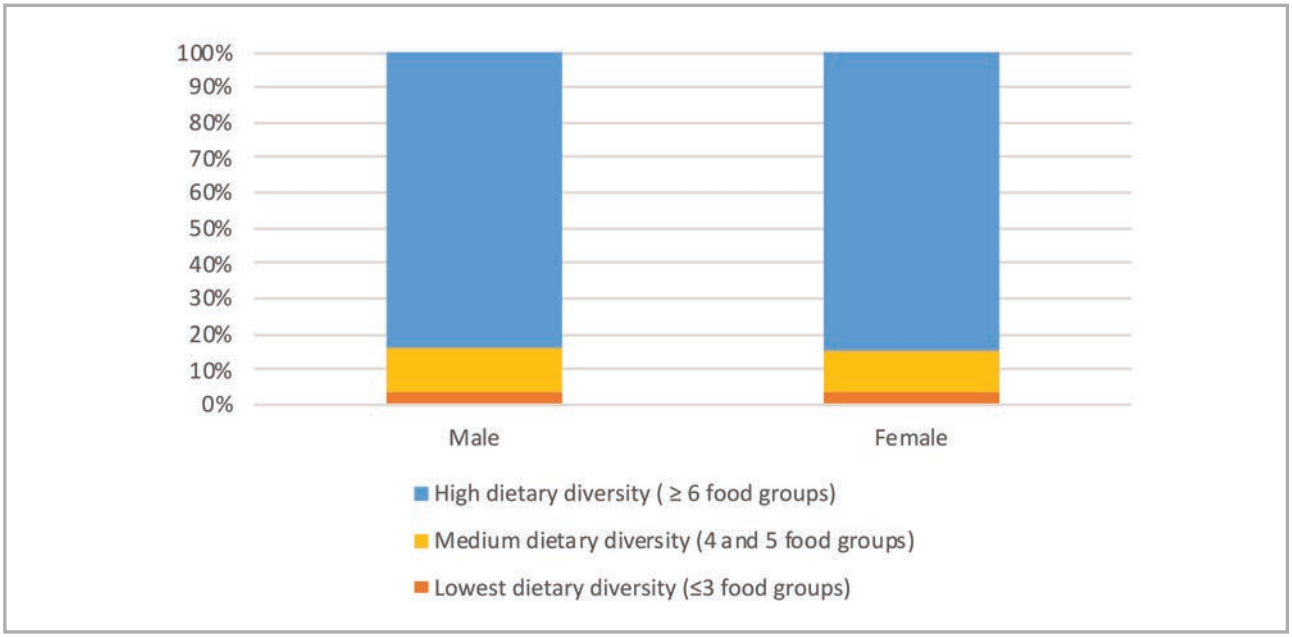


Figure 60: *Dietary diversity category by age of household head*

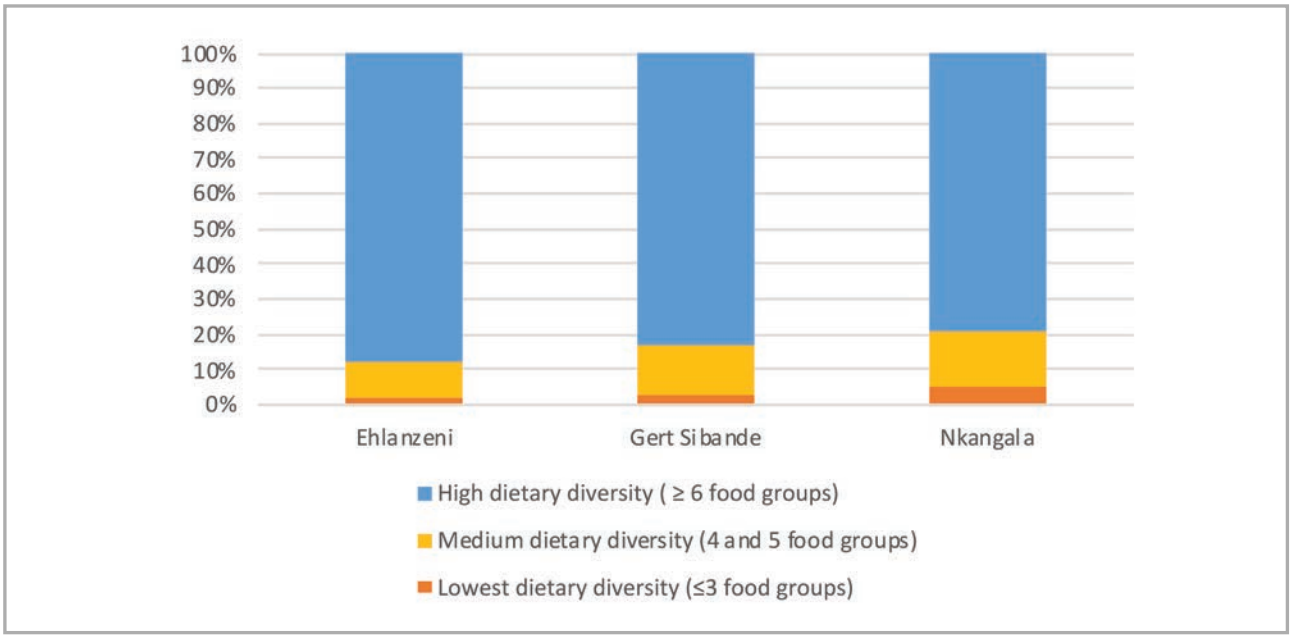


Figure 61: *Dietary diversity disaggregated by district in Mpumalanga Province*

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. A household can lack crucial micronutrients even when consuming a diverse diet. Figure 62 shows the food groups and their frequency of consumption by the households. The most popular food groups were cereals, oils and fats, condiments, sugars, vegetables, meat, fruits, and eggs. The least consumed food groups were pulses and nuts, fish and seafood and tubers. Except for vegetables, the most consumed food groups were mostly the less healthy ones, providing a different light to Figure 46, which gives an impression of a highly diverse and healthy diet.

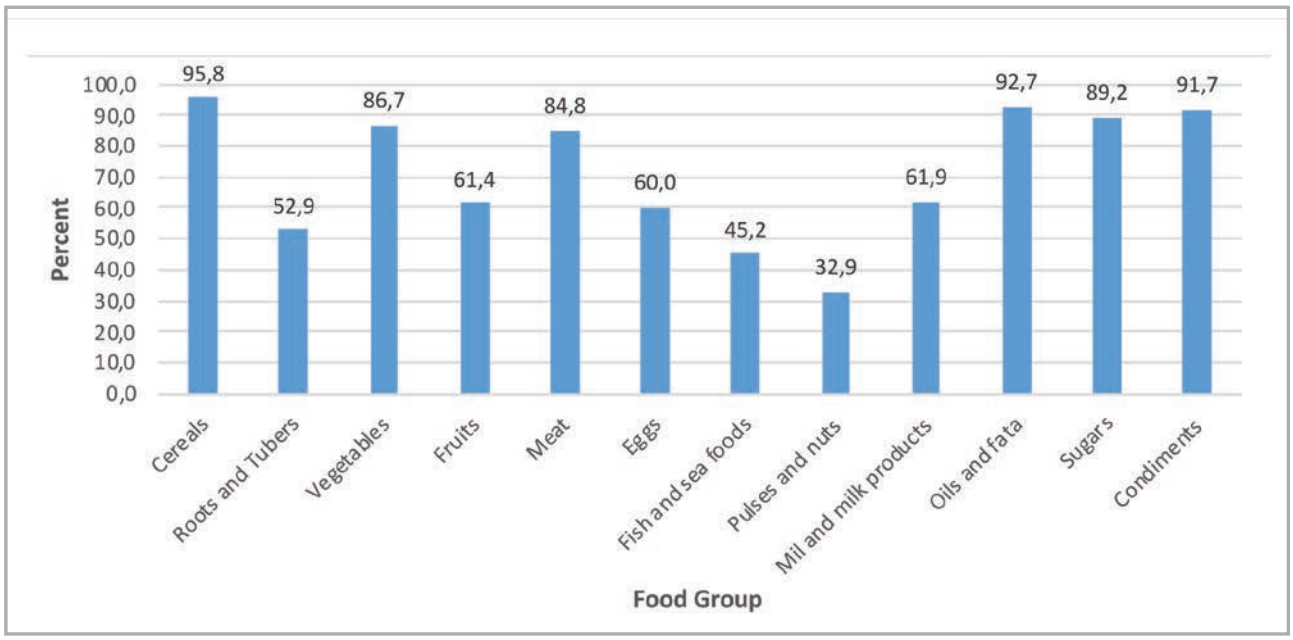


Figure 62: *Frequency of food group consumption in Mpumalanga Province*

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.

Figure 63 shows that most households (47%) were consuming adequately (acceptable) diversified diets, and about 30% 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. Results further indicate that 23% of the households consumed poor diets. This is concerning because more than half (53%) of households are not consuming acceptable diets and this may lead to nutrition-related problems.

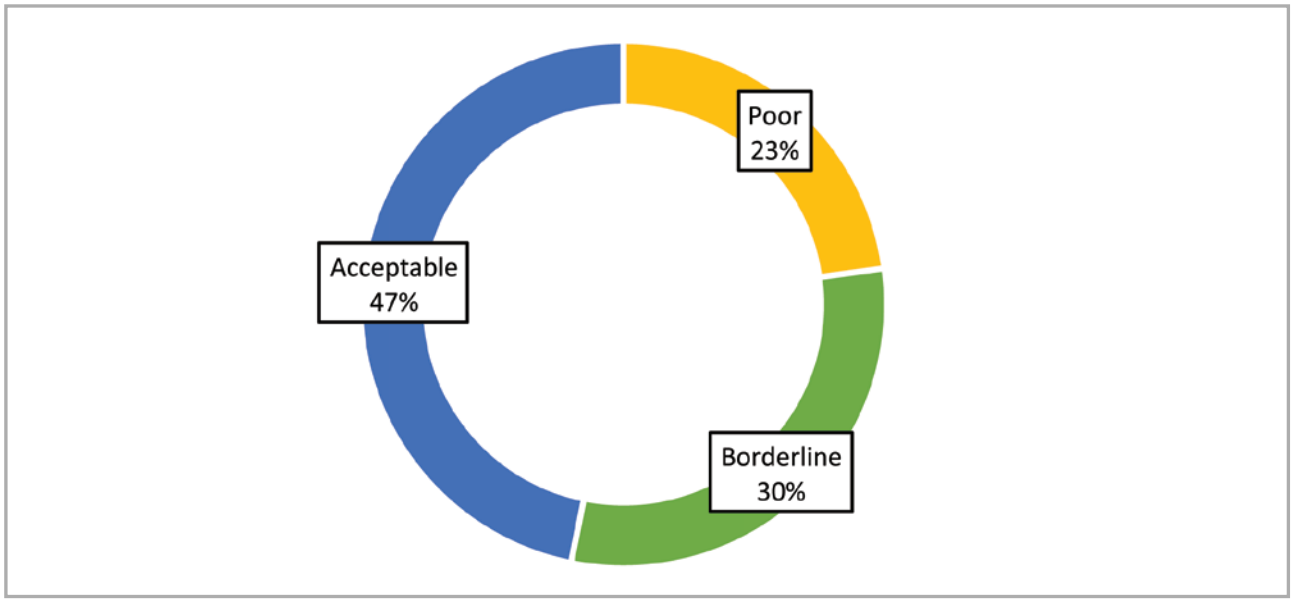


Figure 63: *Food consumption score*

Results in Table 43 presents the food consumption score categories according to sex, age, and district.

Table 43: Food Consumption Score by sex, age of household head, and district

Variable		Poor		Borderline		Acceptable	
		N	Row N %	N	Row N %	N	Row N %
Sex of the household head	Male	108	21	151	30	237	50
	Female	107	22	154	32	222	46
Household head age	18-24	10	31	7	24	13	45
	25-34	22	16	45	31	76	52
	35-44	34	17	65	32	96	51
	45-54	53	22	68	30	106	48
	55-64	53	28	55	29	76	43
	65+	38	19	67	35	88	46
District	Ehlanzeni	73	19	118	32	183	49
	Gert Sibande	71	22	88	29	137	48
	Nkangala	92	28	101	30	139	43

Figure 64 presents the results showing the relationship between sex of household head and food consumption category. The figure indicates that male-headed households had slightly more acceptable diets compared to female-headed households. About 50% of the male-headed households were found to have consumed acceptable diets compared to 46% of the female-headed households. Female-headed households were found in marginally higher proportions in the poor and borderline categories.

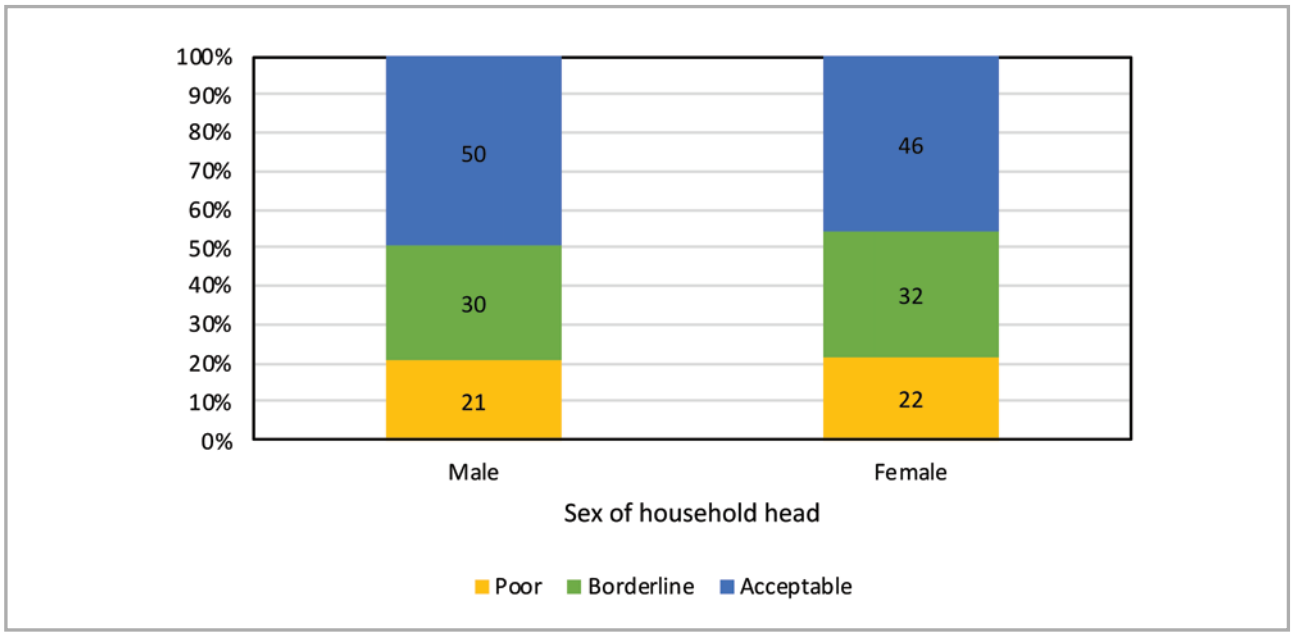


Figure 64: *Food consumption category by sex of household head*

The relationship between the age of household head and the chances of consuming acceptable diets was not linear (Table 43). The proportion of households who consumed acceptable diets increased from 45% among household heads by 18-24 age group to 52% among the next age group (25-34). The percentage of households in the acceptable diets group then progressively decreased, until 55-64 age group, where a marginal increase was observed. Households from the age group of 18-24 were the highest that consumed poor diets.

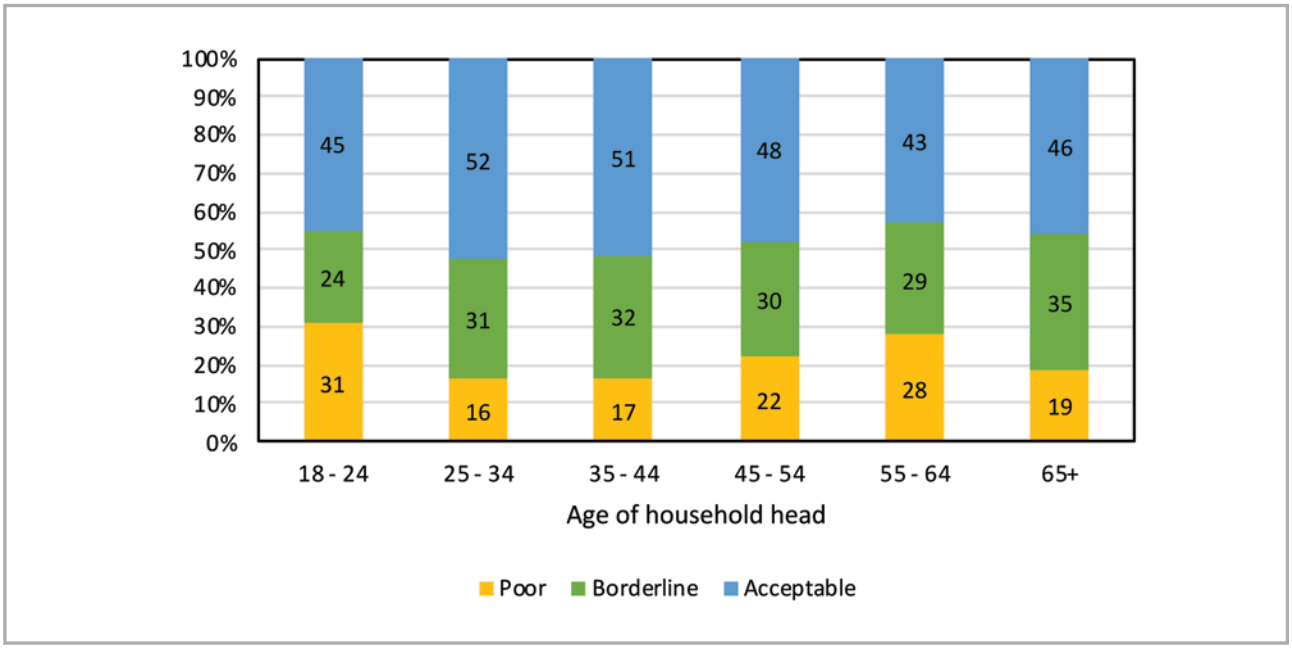


Figure 65: *Food consumption category by age of household head*

Regarding the districts, it was found that more households with poor diets were found in Nkangala District, followed by households from the Gert Sibande District (Table 43). Households from the Ehlanzeni District also consumed slightly diverse diets compared to the other districts, and the district also had slightly more households who were on the borderline. Many households from the different districts are also generally 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.

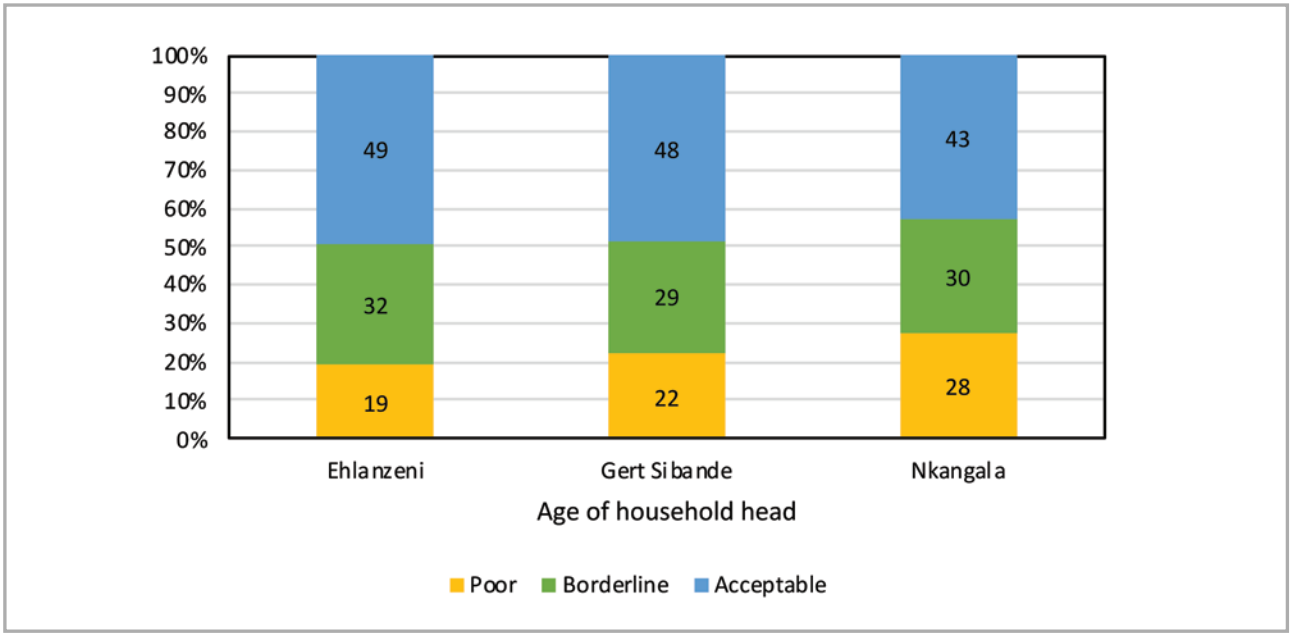


Figure 66: *Food consumption category disaggregated by district in Mpumalanga Province*

7.5 Food Expenditure

The food expenditure approach captures food security in terms of the amounts of money spent by a household to acquire food, and whether that amount is above or below the food poverty line. The food poverty line, commonly referred to as the 'extreme' poverty line, refers to the amount of money that an individual will need to afford the minimum required daily energy intake (Stats SA, 2021). In 2021, the food poverty line was R624 per person per month (Stats SA, 2021). On average, the households' food expenditure per person per month in Mpumalanga was R574.91, which is below the food poverty line (Table 44). The food expenditure levels varied by sex, age group and district. Male-headed households headed by male-households spent about 46% more on food than female-headed households. Across the age-groups, the results show a negative relationship between food expenditure per capita per month and age, with increasing age associated with declining food expenditure. The households in Nkangala District spent more on food than the other two districts.

Table 44: Food expenditure per capita per month by sex, age group, and district

		Mean (Rands per capita per month)
All sample		R574.91
Sex of household head	Male	R682.50
	Female	R467.92
Age group of respondent head	18-24	900.29
	25-34	726.83
	35-44	594.68
	45-54	584.67
	55-64	499.84
	65+	452.18
District	Ehlanzeni	559.93
	Gert Sibande	523.80
	Nkangala	638.56

Using the 2021 food poverty line (i.e., R624), Figure 67 shows that 73% of the households were below the food poverty line. This indicates very high levels of food poverty, which supports the results of the HFIAS results.

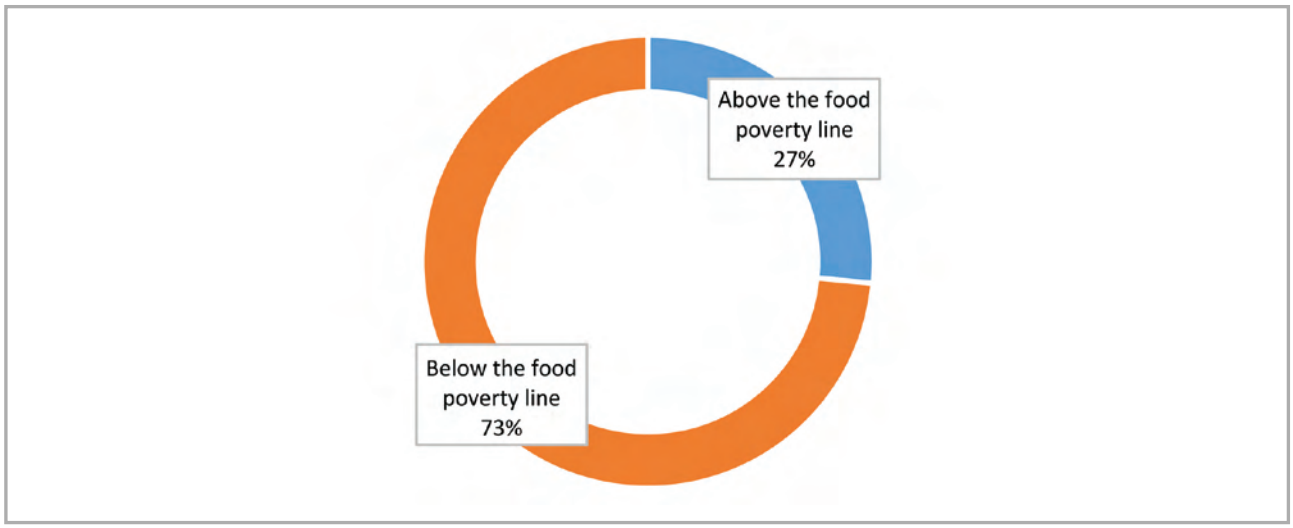


Figure 67: Food poverty levels in Mpumalanga

7.6 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 45 presents the results. The table shows that significant relationships were found between household food security status and some demographics and socioeconomic 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 45: Relationship of food security and socio-economic factors

Variables	Categories	Food security status		t / Chi-square tests
		Food secure	Food insecure	
HH Sex	Male	33.8	62.2	***
	Female	23.9	76.1	
HH age group	18-24	27.7	72.3	***
	25-34	30.7	69.3	
	35-44	31.3	68.7	
	45-54	28.7	71.3	
	55-64	27.8	72.2	
	65+	26.3	73.7	
Marital status	Married	32.7	67.3	***
	Unmarried	25.7	74.3	
District	Ehlanzeni	29.0	71.0	***
	Gert Sibande	26.3	73.7	
	Nkangala	30.9	69.1	
HH education level	No schooling	15.5	84.5	***
	Primary	17.0	83.0	
	Matric	27.8	72.2	
	Tertiary	55.6	44.4	
Household size	mean	3.6	4.4	***
HH employment status	Employed	43.4	56.6	***
	Unemployed	22.1	77.9	
Residential status	Farms	32.5	67.5	****
	Traditional	26.9	73.1	
	Urban	21.7	78.3	

Variables	Categories	Food security status		t / Chi-square tests
		Food secure	Food insecure	
Access to social grants	Beneficiary	19.1	80.1	***
	Non-beneficiary	35.6	64.4	
Access to land	Yes	26.3	73.7	***
	No	30.0	70.0	
Involved in farming activities	Yes	23.8	76.2	1***
	No	29.7	70.3	
Access to irrigation	Yes	22.8	77.2	***
	No	18.7	81.3	
Access to extension	Yes	28.2	71.8	**
	No	28.9	71.4	
Access to markets	Yes	39.0	61.0	***
	No	28.7	71.3	
Access to road infrastructure	Yes	30.5	69.5	***
	No	18.4	81.6	
Access to improved water sources	Yes	29.2	70.8	***
	No	24.6	75.4	
Access to improved sanitation	Yes	29.0	71.0	***
	No	22.8	77.2	

Table 45 shows female-headed households were significantly more likely to be food insecure than male-headed households. Among male-headed households, 33.8% were food secure, while only 23.9% were food secure among female-headed households. 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 services, training, information, and inputs, which limits the livelihood options for females, compounding the food security plight of their households. The age of a household head also significantly varied with the food status of their households. 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 insecure group. This finding was not expected, since one would expect the household heads in the late 30s and early 50s to have access to more opportunities than the younger or older.

Households in the food secure category had fewer household members than those in the food insecure category, and this difference was statistically significant. This was expected, more members imply more mouths to feed, thus a greater burden than in smaller ones. Table 45 shows a positive and significant relationship between the education level of household heads and household food security. The proportion of food secure households increased significantly as education levels also increased. For example, while about 15% of households headed by people with no education were food secure, more than 55% of households headed by people with tertiary qualifications were food secure. 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 Mpumalanga, could lead to better information access and assimilation, which may increase awareness of the possible advantages of modernising 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.

Households that were involved in agriculture were those characterised by higher levels of food insecure. This implies that farming activity is last resort livelihood activity, with those households with limited alternative activities resorting to farming. It should be clear that the result does not indicate that involvement in farming activities leads to food insecurity, which is a fallacy of causation, but that households facing challenges in accessing food resort to farming activities. Without engaging in farming activities, their food security situation would have been worse. Similarly, the result showing that households who reported to have access to land for farming activities were likely to be those who experienced higher levels of food insecurity suggests that food insecurity is more prevalent to farming activities. Households with access to land for farming activities are often located in rural areas, where livelihood opportunities are very limited. While access to land provides a potential livelihood option, these are often small pieces of land often located in areas with poor soil quality, and the productivity of the farming activities remain low, due to factors such as rudimentary farming methods, poor pest and disease management practices, inadequate extension advisory services, etc. Households in farms (32.5%) reported higher levels of food security than those in traditional (26.9%) and urban (21.7%) areas. Employment was positively and significantly associated with food security. Employment remains crucial pathway in alleviating the scourge of poverty and food insecurity.

The results show that access to infrastructure (such as roads) and basic services (such as water and sanitation) are crucial in improving the food security status of households. Access to all-weather roads reduce transport costs to and from the market, whether to buy (inputs, food, etc.), or to sell output. Those located near accessible roads are likely to have better access to market information (prices of inputs, food items, commodities), and they are thus in a better position to achieve better transactions and savings. Access to safe water and sanitation are an 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 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. The areas that need improvements in the sector relate to 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 use of latrines and washing hands with soap after using the toilet.

7.7 Discussion

The food security situation in the Mpumalanga Province continues to be a cause for concern.

The food access indicators have shown that a considerable proportion of households face difficulties in accessing food, with the Household Food Insecurity Access Score (HFIAS), indicating that close to three quarters of the households (71%) in Mpumalanga Province experienced food insecurity, with only 29% found to be food secure. This figure is considerably higher when compared with previous studies, such as Stats SA (2020) who reported in the General Household survey 2020 that 32.8% of the sampled households in the Mpumalanga were experiencing food access difficulties.

The HFIAS also showed that 22.2% of the households were severely food insecure, 30.2% of the surveyed households were moderately food insecure, while 18.5% of the households were mildly food insecure. This household food security situation is not strange, bearing in mind that the data was collected during COVID-19 pandemic. This implies that the COVID-19 measures may have affected both food availability and access in the study area. The higher food insecurity figures reported in this study could also be possibly because the study largely focussed on open access livelihood zones and these are generally rural communities which are traditionally more food insecure, hence you would expect higher food insecurity levels there. Overall, 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. 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. The Rapid Assessment Study on the impact of COVID-19 on food and nutrition security found that about 48.9% of individuals in South Africa have moderate to severe food insecurity.

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 (71.6%). About 20.6% and 7.7% of the households experienced moderate hunger and severe hunger, respectively. 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 Mpumalanga Province. Also, emerging results from the household survey indicate that 73% of the male-headed households experienced little to no hunger, compared to 70% of the female-headed households. This situation indicates that there is a need for interventions tailor-made for female-headed households to assist them reduce hunger experiences. Likewise, the moderate and severe hunger in the household were slightly more experienced by female-headed households compared to male-headed households.

The Food Consumption Score (FCS) revealed that most households (47%) were consuming adequately (acceptable) diversified diets and about 30% 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. The findings denote the importance for the government to develop interventions that enhance access to diverse foods in most of the areas across districts as a number of these districts are on borderline diets.

The most popular food groups were cereals, oils and fats, condiments, sugars, vegetables, meat, fruits, and eggs. The least consumed food groups were pulses and nuts, fish and seafood, and tubers. This shows that the most consumed food groups were mostly the less healthy ones, providing a different light to what a dietary diversity score showed which gave an impression of a highly diverse and healthy diet.

8 Nutrition

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, 2003; 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 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 144 children under the age of 2 years. Of those aged 0-11 months (n=87), 80.8% were ever breastfed, while 88.6% were breastfeeding at the time the survey was conducted. In children aged 12-24 months (n=93), 84.0% were ever breastfed, while 51.4% were being breastfed at the time the survey was conducted (Table 46). Exclusive breastfeeding was reported in 27.8% of all children aged 0-6 months. Reports of between 70.3% and 91.2% were recorded for children that were ever breastfed across all districts with no significant differences between districts. Ehlanzeni and Gert Sibande districts reported a similar proportion of children (71.0% and 70.3%, respectively), while Nkangala reported the highest proportion (91.2%) currently being breastfed; 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.

Table 46: Breastfeeding status among infants aged 0-24 months in Mpumalanga

	Ever been breastfed			Currently breastfed1			Exclusively breastfed (0-6 months)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
Age(months)									
0-11 months	80.8	[66.6-89.9]	87	88.6	[76.3-94.9]	70			
12-24 months	84.0	[68.8-92.5]	93	51.4	[27.4-74.7]	74			
Gender									
Male	82.5	[61.9-93.2]	93	75.4	[54.3-88.8]	73	*	*	14#
Female	82.0	[68.0-90.7]	87	66.0	[49.5-79.4]	71	*	*	18#

	Ever been breastfed			Currently breastfed1			Exclusively breastfed (0-6 months)		
	%	95% CI	n	%	95% CI	n	%	95% CI	n
District									
Ehlanzeni	71.0	[37.9-90.7]	62	79.4	[61.6-90.3]	46	*	*	5#
Gert Sibande	70.3	[48.9-85.4]	42	66.7	[34.7-88.3]	30	*	*	5#
Nkangala	91.2	[83.4-95.5]	76	70.6	[48.3-86.0]	68	*	*	22#
Total	**82.3**	**[70.8-89.9]**	**180**	**71.1**	**[55.5-83.0]**	**144**	**27.8**	**[12.5-50.9]**	**32**

1among those ever breastfed * cell sample sizes too small to generate reasonable estimate # n<30

Time lapsed until the introduction of breastfeeding

In most infants aged 0-24months, (n=143), breastfeeding was introduced immediately (86.9%), within the first hour (6.2%) or within 24 hours (4.3%) (Table 47). Only in 2.4% 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.

More than 80% of all children across all districts, were immediately introduced to breastfeeding. Nkangala reported the lowest rates (81.9%), followed by Ehlanzeni (88.9%), while Gert Sibande reported the highest rate (100%). There was, therefore, a significant difference in the time lapsed until the introduction of breastfeeding between Gert Sibande and the other districts.

Table 47: Time lapsed until the introduction of breastfeeding among infants aged 0-24 months in Mpumalanga

	Immediately		Less than one hour		Less than 24 hours		More than 24 hours		Don't know		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age											
0-11 months	86.7	[59.5-96.7]	9.4	[2.3-31.6]	1.2	[0.2-9.0]	2.6	[0.4-15.3]	0.0		70
12-24 months	87.1	[63.5-96.3]	2.4	[0.5-10.4]	7.7	[1.2-37.4]	2.3	[0.3-15.9]	0.5	[0.1-4.1]	73
Gender											
Male	86.5	[62.9-96.0]	4.3	[1.2-14.7]	6.6	[1.0-33.6]	2.6	[0.3-16.7]	0.0		73
Female	87.3	[73.0-94.6]	8.4	[2.5-24.8]	1.5	[0.2-10.4]	2.3	[0.3-15.6]	0.5	[0.1-4.0]	70
District - MP											
Ehlanzeni	88.9	[64.1-97.3]	0.0		4.3	[0.6-25.8]	6.8	[0.9-35.9]	0.0		46
Gert Sibande	100.0	[100.0-100.0]	0.0	[0.0-0.0]	0.0		0.0		0.0		30
Nkangala	81.9	[59.2-93.3]	9.8	[3.0-27.8]	5.7	[0.8-30.7]	2.2	[0.4-12.2]	0.4	[0.0-3.0]	67
Total	86.9	[71.5-94.6]	6.2	[1.9-18.7]	4.3	[0.8-19.2]	2.4	[0.6-8.9]	0.2	[0.0-1.8]	143

8.1.1.1 Age at which breastfeeding was stopped

In children aged 0-24 months (n=47), breastfeeding was most often stopped between the ages of 7-12 months (43.1%). Nearly 50% of mothers stopped breastfeeding before the age of 6 months (19.4% stopped breastfeeding before 3 months, 11.3% stopped between 3-4 months and 18.7% stopped between 5-6 months (Figure 68). Only 7.4% of mothers continued to breastfeed up to 18 months, with no reports of breastfeeding continuing up to 24 months. No significant differences were found when disaggregating the data by districts. Due to the small sample size when disaggregating by district, no comparisons could be made at a district level.

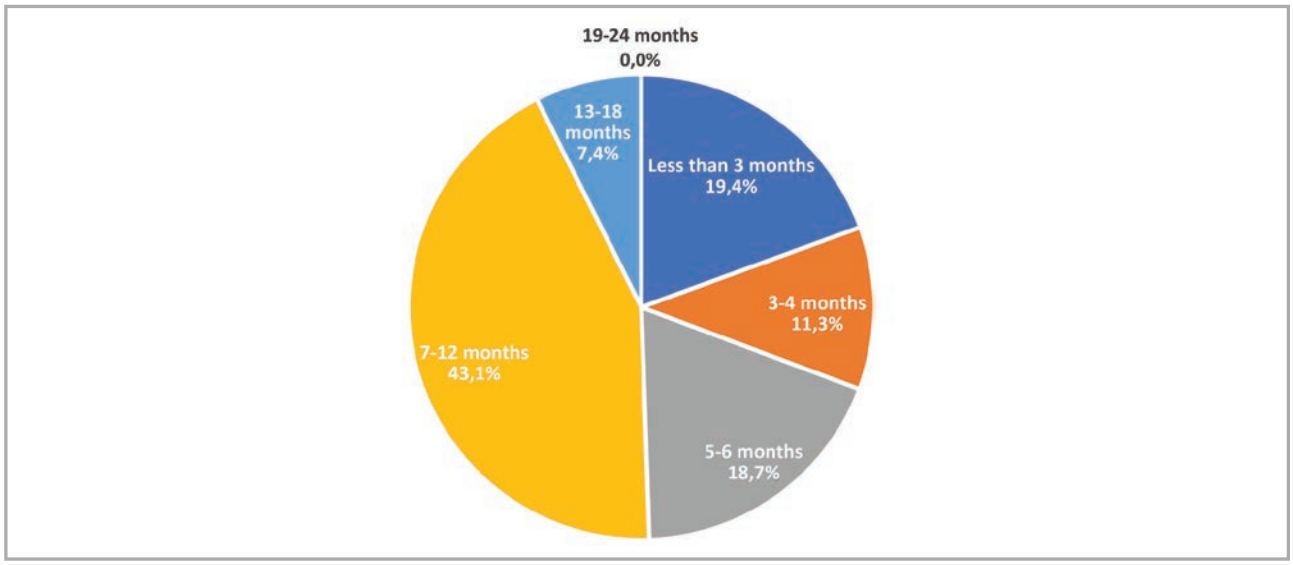


Figure 68: *Age at which breastfeeding was stopped among infants aged 0-24 months in Mpumalanga*

8.1.1.2 First drink other than breastmilk

Infant formula (34.7%) and plain water (23.1%) were reported to be the most common first drink, other than breastmilk, that was introduced to infants under 2 years of age (Figure 69). There were significant differences between age groups for the introduction of tea, juice, homemade mixtures, and other drinks. Children aged 0-11 months were not given juice, tea, or homemade mixtures as their first drink, while 18.3%, 2.1% and 0.5% of those aged 12-24 months were introduced to these respectively, as their first drinks. There was also a significantly higher proportion of other drinks listed as a first drink in those aged 0-11 months (12.7%) compared to those aged 12-24 months (0.4%). There were, however, no significant differences found between male and female children.

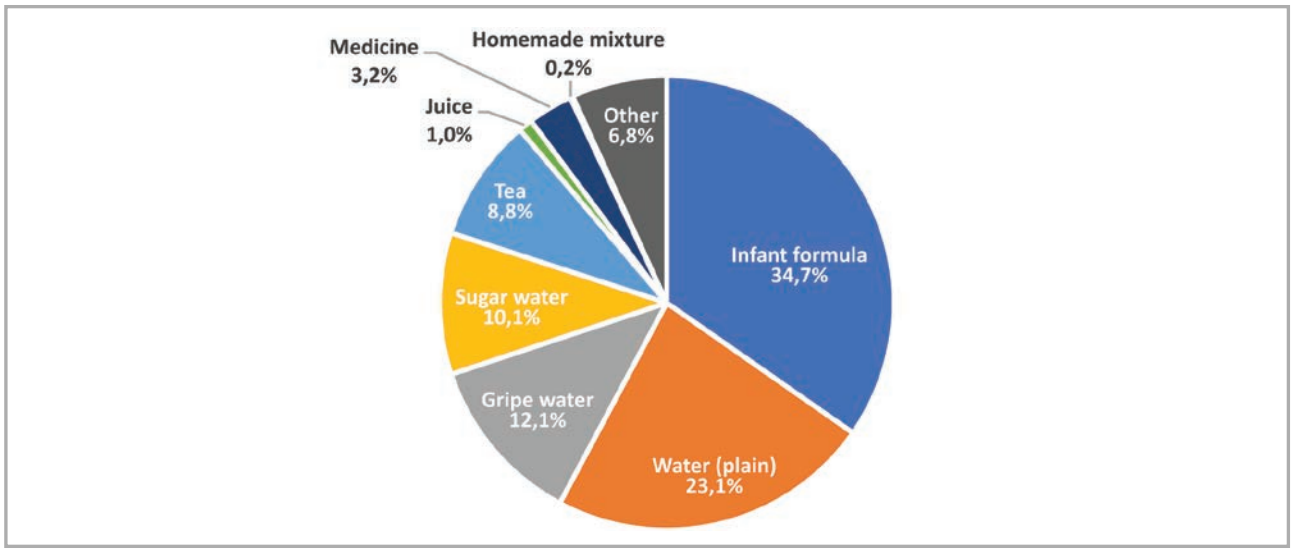


Figure 69: *First drink other than breastmilk among infants aged 0-24 months in Mpumalanga*

All districts reported infant formula, followed by water, as the most common first drink other than breastmilk that was introduced to children aged 0-24 months. While Ehlanzeni and Gert Sibande reported infant formula in more than 50% of infants, Nkangala only reported this for 22.1% of infants; however, this was not significantly different (Table 48). Other drinks such as gripe water, sugar water, juice, tea, and medicine were reported as first drinks by less than 16.0% of mothers across all districts, with no significant differences between districts. It is interesting to note that 14.4% of mothers in Nkangala reported tea as a first drink compared to less than 1.0% in the other districts. It is important to note, though, that district level comparisons must be interpreted with caution due to the small sample sizes in these districts.

Table 48: The first drink other than breast milk among children aged 0-24 months by district in Mpumalanga

	Infant formula		Water (plain)		Gripe water		Sugar water		Tea		Juice		Medicine		Home-made mixture		Other		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
District - MP																			
Ehlanzeni	52.8	[33.7-71.1]	25.4	[11.8-46.5]	10.2	[4.5-21.4]	6.5	[2.3-17.2]	0.8	[0.1-5.4]	1.4	[0.2-9.5]	0		1.2	[0.2-9.5]	1.7	100	65
Gert Sibande	52.0	[21.5-81.1]	29.7	[6.6-71.7]	4.2	[0.5-27.3]	12.2	[3.5-34.8]	1.0	[0.2-4.6]	0		0	[0.0-0.0]	0		0.8	100	38
Nkangala	22.1	[10.0-42.0]	19.7	[9.2-37.2]	15.7	[7.9-28.8]	10.4	[3.3-28.3]	14.4	[2.9-48.5]	1.3	[0.2-6.4]	5.5	[0.8-30.7]	0		10.8	100	75
Total	**34.7**	**[21.4-50.9]**	**23.1**	**[12.8-37.9]**	**12.1**	**[6.5-21.3]**	**10.1**	**[4.7-20.4]**	**8.8**	**[1.8-34.3]**	**1.0**	**[0.3-3.8]**	**3.2**	**[0.5-19.3]**	**0.2**	**[0.0-1.8]**	**6.8**	**[3.6-12.5]**	**178**

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 0-1month (66.0%), followed by 3 months (13.2%) in children aged 0-11months. In children aged 12-24 months, other drinks were mainly introduced at 0-1months (45.9%), followed by more than 6 months (27.9%) (Table 49). We can assume that the introduction of other drinks before the age of 1 month is most likely the introduction of infant formula. Of the remaining children, less than 10% were introduced to other drinks between 2-6 months of age.

When doing comparisons by gender, 60.8% were introduced to other drinks before the age of one month; however, in the remaining males, nearly 20% were only introduced to other drinks after 6 months. Less females (51.9%) were introduced to other drinks before the age of 1 month, but less than 10% were introduced to other drinks after 6 months of age, with about 12.9% being introduced to other drinks around 3 months of age. This seems to indicate that more male children are possibly exclusively breastfed compared to female children.

Similar patterns were displayed across districts, where most children were introduced to other drinks before the age of 1 month (52.3%-65.3%). This was followed by 3 months in Ehlanzeni (19.1%), 2-3 months in Gert Sibande (16.7% and 15.9%) and over 6 months in Nkangala (21.8%). It, therefore, seems as if the proportion of exclusive breastfeeding is higher in Nkangala than it is in the other two districts.

Table 49: Age at which the first drink other than breastmilk was introduced among infants aged 0-24 months in Mpumalanga

	0-1 month		2 months		3 months		4 months		5 months		6 months		>6 months		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)															
0-11 months	66.0	[50.3-78.9]	5.1	[1.3-18.5]	13.2	[6.0-26.7]	6.2	[1.4-24.0]	4.2	[1.3-12.6]	2.7	[0.8-9.0]	2.5	[0.3-16.4]	84
12-24 months	45.9	[24.8-68.6]	6.3	[1.2-27.5]	5.6	[2.2-13.6]	0.8	[0.2-4.0]	4.6	[1.0-19.0]	8.9	[4.9-15.4]	27.9	[9.8-58.0]	92
Gender															
Male	60.8	[43.7-75.6]	3.0	[0.5-16.1]	6.6	[2.5-16.4]	1.8	[0.4-7.4]	2.9	[0.6-13.0]	6.0	[2.7-13.1]	18.8	[5.1-49.9]	91
Female	51.9	[33.0-70.2]	8.6	[2.4-26.2]	12.9	[5.8-26.4]	5.8	[0.9-28.7]	6.0	[1.8-18.4]	5.1	[2.0-12.7]	9.8	[4.2-21.2]	85
District															
Ehlanzeni	65.3	[43.5-82.2]	1.3	[0.3-5.3]	19.1	[7.6-40.4]	1.5	[0.3-5.9]	1.7	[0.2-11.7]	9.0	[3.0-23.6]	2.2	[0.5-8.9]	63
Gert Sibande	60.1	[34.0-81.5]	16.7	[5.3-41.8]	15.9	[6.0-36.3]	0.0	[0.0-0.0]	0.0		1.2	[0.2-6.1]	6.0	[1.2-24.5]	39
Nkangala	52.3	[39.8-64.6]	2.6	[0.5-12.3]	4.0	[1.2-12.4]	5.9	[1.3-23.0]	7.0	[2.7-17.0]	6.3	[3.0-12.8]	21.8	[8.6-45.5]	74
Total	**56.6**	**[45.8-66.7]**	**5.7**	**[1.9-15.5]**	**9.6**	**[4.9-18.0]**	**3.7**	**[0.9-13.8]**	**4.4**	**[1.8-10.5]**	**5.6**	**[3.1-9.9]**	**14.5**	**[5.7-32.2]**	**176**

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 (4.7 months) and males (4.1 months) as compared to children aged 0-11 months (2.1 months) and females (2.4 months) (Table 50). At a district level, the mean age was higher in Nkangala (4.0 months) than it was in Ehlanzeni (2.6 months). Results for Gert Sibande could not be computed due to the small sample size in this district (n=23) (Table 50).

Table 50: Mean age at introduction of milk feeds among infants 0-24 months old in Mpumalanga

	Mean	95% CI	n
Age (months)			
0-11 months	2.1	[1.2-3.1]	50
12-24 months	4.7	[2.2-7.1]	47
Gender			
Male	4.1	[1.8-6.4]	48
Female	2.4	[1.6-3.2]	49

	Mean	95% CI	n
District			
Ehlanzeni	2.6	[1.0-4.2]	37
Gert Sibande	*	*	23#
Nkangala	4.0	[2.4-5.6]	37
Total	**3.1**	**[2.0-4.2]**	**97**

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

Reports on the type of milk other than breastmilk that infants received could not be reported for the Mpumalanga Province.

8.1.1.5 Solid foods

The mean age at which first semi-solid or solid foods were introduced was 4.9 months. There were no significant differences, between age groups, gender, and districts. (Table 51).

Table 51: Age at introduction of first semi-solid or solid food in Mpumalanga

	Mean	95% CI	n
Age (months)			
0-11 months	3.3	[2.6-3.9]	77
12-24 months	6.5	[3.8-9.2]	94
Gender			
Male	5.8	[3.4-8.2]	86
Female	3.9	[3.0-4.7]	84
District			
Ehlanzeni	4.9	[3.4-6.4]	63
Gert Sibande	4.5	[3.0-6.0]	34
Nkangala	5.0	[2.9-7.1]	74
Total	**4.9**	**[3.6-6.2]**	**171**

Table 52 shows that commercial infant cereal was the first semi solid food given to the majority of children aged 0-24 months (39.9%), followed by homemade infant cereal/porridge (30.1%). There were no significant differences between infants aged 0-11 and 12-24 months. A further 9.2% of mothers reported that pureed/ mashed vegetables/ fruit as their first foods. Less than 5% of infants had cereal/porridge supplied by the clinic, bottled/canned baby foods and custard as their first semi-solid foods, while 8.0% and 6.1% of mothers reported other foods and traditional baby foods as their infants first food, respectively.

There were no significant differences when disaggregating by gender or district.

Table 52: Types of first semi-solid or solid food among infants 0-24 months in Mpumalanga

	Name of 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		Custard		Other (specify)		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)																	
0-11 months	32.2	[21.2-45.6]	21.2	[11.9-35.0]	0		18.3	[7.0-39.8]	3.9	[0.9-15.7]	7.5	[2.2-22.5]	1.1	[0.1-7.2]	15.8	[7.4-30.8]	75
12-24 months	47.5	[27.2-68.7]	39.0	[20.7-61.0]	2.8	[0.6-11.9]	0	[0.0-0.0]	5.9	[0.8-32.9]	4.6	[1.6-12.4]	0		0.1	[0.0-1.0]	94
Gender																	
Male	41.9	[27.4-58.0]	25.8	[11.9-47.3]	2.7	[0.6-11.1]	13.8	[5.2-32.2]	6.5	[1.2-29.4]	2.1	[0.5-8.9]	0		7.1	[2.4-19.5]	86
Female	38.2	[21.6-58.1]	33.8	[20.0-51.1]	0		3.9	[1.2-12.2]	3.1	[0.4-19.2]	10.7	[4.9-22.0]	1.1	[0.2-6.5]	9.2	[3.2-23.6]	82
District																	
Ehlanzeni	44.1	[26.2-63.7]	34.8	[19.4-54.1]	0		14.7	[2.9-49.5]	1.2	[0.2-8.6]	5.2	[1.9-13.8]	0		0		62
Gert Sibande	54.5	[31.9-75.3]	27.5	[10.1-56.2]	0		0		1.3	[0.2-9.5]	2.4	[0.3-16.2]	0		14.3	[3.5-43.9]	37
Nkangala	32.0	[16.3-53.3]	29.6	[14.1-51.8]	2.5	[0.6-10.0]	11.2	[4.2-27.0]	7.7	[1.7-29.2]	8.0	[2.9-20.2]	0.9	[0.1-5.8]	8.0	[3.1-19.0]	70
Total	**39.9**	**[28.6-52.3]**	**30.1**	**[18.8-44.4]**	**1.4**	**[0.3-6.0]**	**9.2**	**[3.7-20.8]**	**4.9**	**[1.3-16.9]**	**6.1**	**[2.8-12.8]**	**0.5**	**[0.1-3.5]**	**8.0**	**[3.6-17.0]**	**169**

8.1.2 Anthropometry (0-5years)

This section presents the key nutrition findings for children aged 0-59 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 substantial mortality and disease burden worldwide. The Lancet series (2013) reported that malnutrition accounts for 45% of all the deaths of children under the age of five. This estimate translated to 3.1 million deaths globally in 2011. It is further reported that it includes intrauterine fetal growth restriction, stunting, wasting, and micronutrient deficiency - especially of vitamin A and Zinc. This occurs along poor infant feeding practices which are indicated by suboptimum breastfeeding. Data was recorded for 407 children under the age of 5 years. Of these there was a slightly higher number of boys (52.1%) than girls (47.9%) (Table 53).

Table 53: Distribution of age and sex of the sample in Mpumalanga

	Boys		Girls		Total	
AGE (months)	n	%	n	%	n	%
<6	16	55.2	13	44.8	29	7.1
6-17	48	50.0	48	50.0	96	23.6
18-29	39	46.4	45	53.6	84	20.6
30-41	44	54.3	37	45.7	81	19.9
42-53	40	52.6	36	47.4	76	18.7
54-59	25	61.0	16	39.0	41	10.1
Total	**212**	**52.1**	**195**	**47.9**	**407**	**100**

8.1.2.1 Stunting

There appears to be a trend showing that generally stunting decreases with increasing age. Results for children aged 0-6 months cannot be shown reliably due to the small sample size (n=27). The overall prevalence of stunting for children under the age of 5 years (n=382) was 28.5%, of which 16.2% was severe and 12.3% was moderate stunting (Table 54 and Figure 70). Overall, children in the youngest age group had a higher prevalence of stunting (overall, moderate, and severe) compared to those in the older age groups. However, for overall stunting this was only significant between the 6-17 months and the 42-53 months age groups. For moderate stunting, this was significant between the 6-17 months and the 18-29 months age groups. There were no significant differences between age groups for severe stunting.

Comparisons by gender in all children in Mpumalanga under 5 years of age indicated that females had a slightly higher prevalence of stunting (29.7%) compared to males (27.1%); however, this was not significant (Table 7.9 and Figure 71).

District comparisons show that the overall prevalence of stunting was highest in the Gert Sibande District (39.2%), with an almost equal spread between severe stunting (19.7%) and moderate stunting (19.5%). Ehlanzeni reported the lowest overall prevalence of stunting (14.6%) compared to Nkangala (28.6%) and Gert Sibande (39.2%); however, there were no significant differences between these districts (Table 54 and Figure 72).

Table 54: The prevalence of Stunting in children under 5 years in Mpumalanga by age, sex, and district

	No stunting HAZ>=-2		All stunting HAZ<-2		Moderate stunting HAZ<-2 and >=-3		Severe stunting HAZ<-3		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)									
<6	*		*		*		*		27#
6-17	50.5	[28.1-72.6]	49.5	[27.4-71.9]	21.8	[10.1-40.8]	27.7	[9.0-59.9]	88
18-29	78.9	[60.5-90.2]	21.1	[9.8-39.5]	3.4	[1.2-9.7]	17.7	[7.9-35.0]	79
30-41	68.1	[45.3-84.7]	31.9	[15.3-54.7]	16.3	[8.2-29.9]	15.5	[3.4-49.2]	78
42-53	90.7	[80.3-95.9]	9.3	[4.1-19.7]	5.2	[1.8-13.9]	4.1	[1.0-15.3]	73
54-59	89.5	[72.0-96.6]	10.5	[3.4-28.0]	8.9	[2.6-26.5]	1.6	[0.2-11.4]	37

	No stunting HAZ>=-2		All stunting HAZ<-2		Moderate stunting HAZ<-2 and >=-3		Severe stunting HAZ<-3		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Gender									
Female	72.9	[59.3-83.3]	27.1	[16.7-40.7]	7.5	[3.6-14.7]	19.6	[10.7-33.4]	184
Male	70.3	[60.9-78.3]	29.7	[21.7-39.1]	16.6	[8.5-29.9]	13.1	[5.5-28.0]	198
District									
Gert Sibande	**60.8**	**[45.6-74.1]**	**39.2**	**[25.9-54.4]**	**19.5**	**[12.4-29.3]**	**19.7**	**[11.3-32.1]**	**103**
Nkangala	71.4	[58.8-81.3]	28.6	[18.7-41.2]	10.1	[6.2-16.1]	18.5	[9.8-32.1]	138
Ehlanzeni	85.4	[72.7-92.8]	14.6	[7.2-27.3]	8.2	[3.8-16.5]	6.4	[2.9-13.6]	141
Total	**71.5**	**[62.5-79.1]**	**28.5**	**[20.9-37.5]**	**12.3**	**[8.6-17.3]**	**16.2**	**[10.3-24.5]**	**382**

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

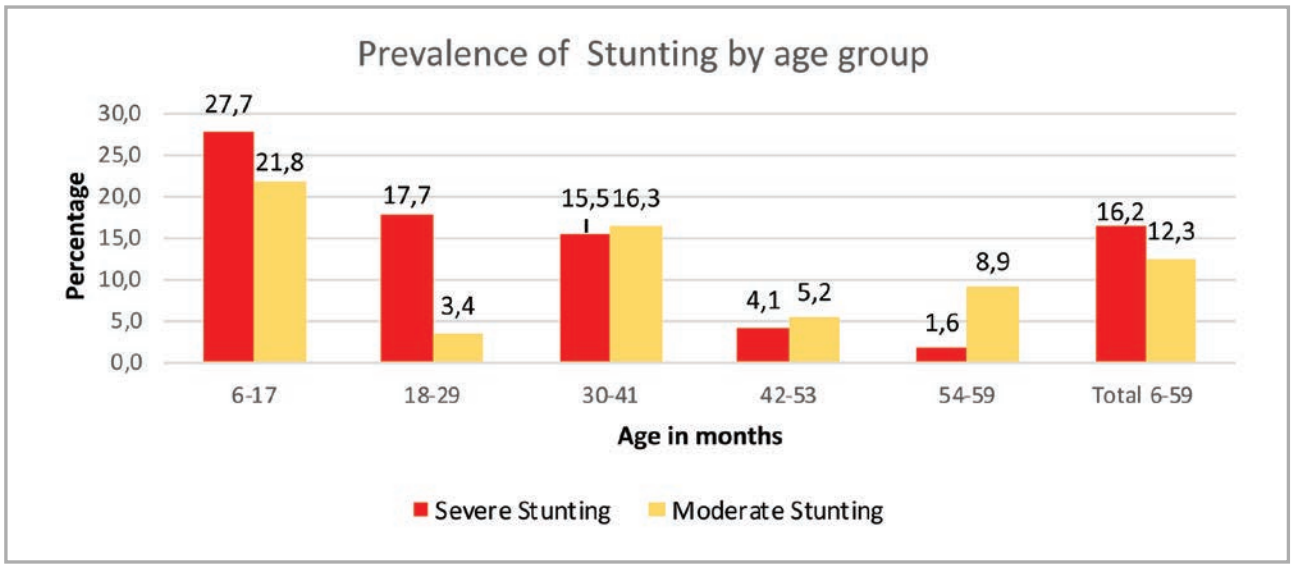


Figure 70: *The prevalence of Stunting in children under 5 years in Mpumalanga by age group*

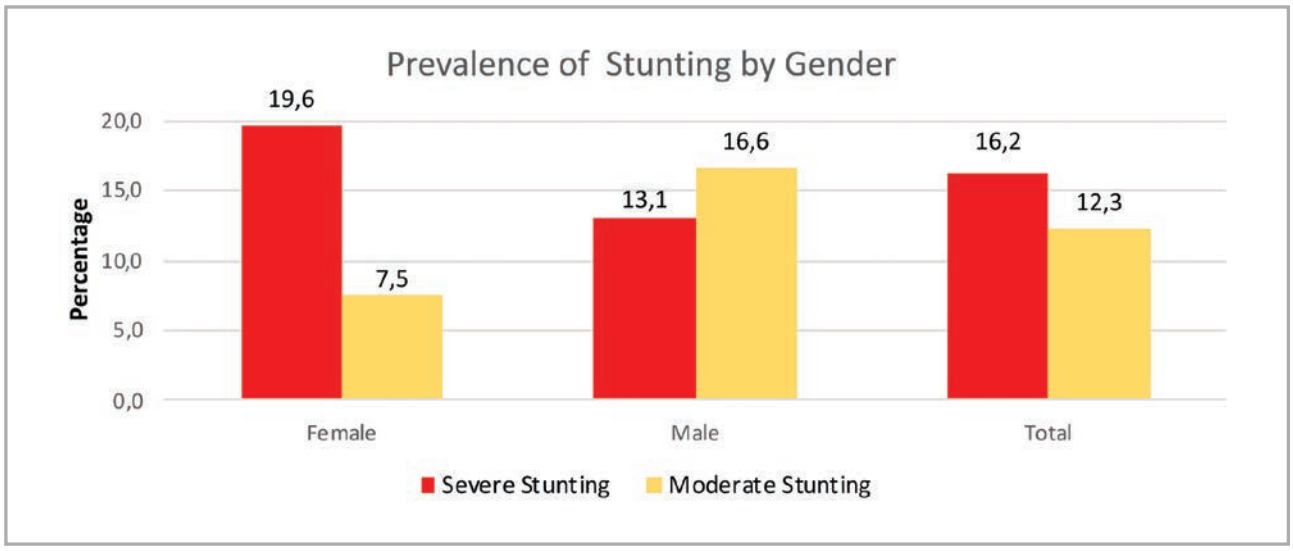


Figure 71: *The prevalence of Stunting in children under 5 years in Mpumalanga by gender*

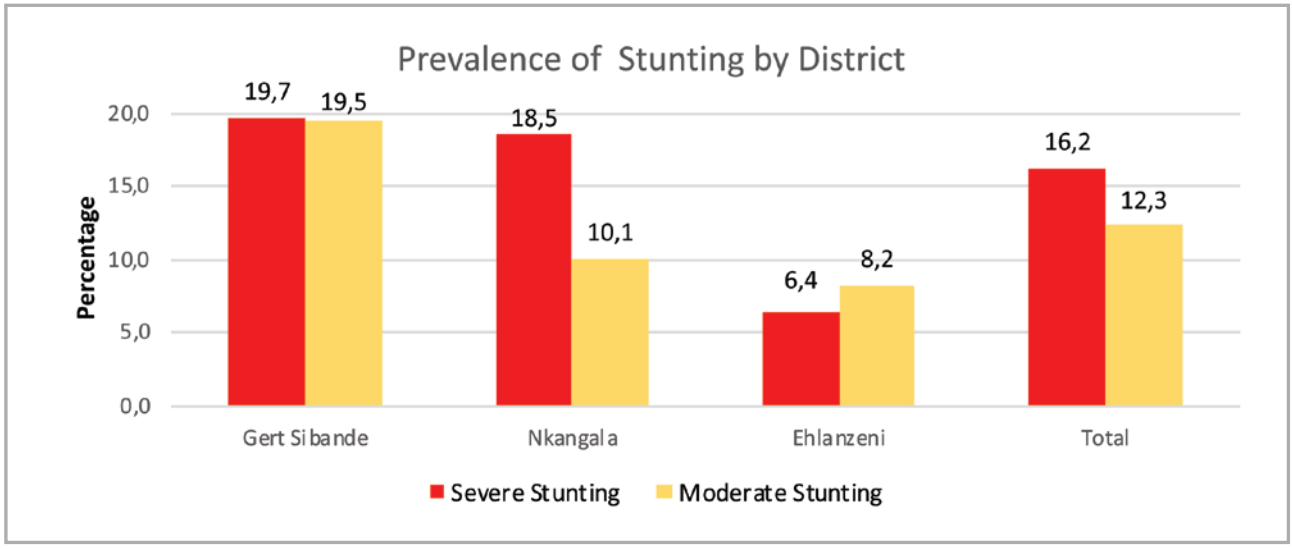


Figure 72: *The prevalence of Stunting in children under 5 years in Mpumalanga by district*

8.1.2.2 Wasting

The overall prevalence of wasting for children under the age of 5 years (n=366) was 6.0%, of which 4.0% was severe and 2.0% was moderate wasting (Table 55 and Figure 73). As with stunting, results for children aged 0-6 months cannot be shown reliably due to the small sample size (n=25). The prevalence of severe wasting was highest in children aged 6-17 months (3.1%), while moderate wasting was highest in children aged 42-53 months (5.6%). The only significant difference occurred in severe wasting in children aged 18-29 months as there were no children that were severely stunted in this age group.

Comparisons between gender showed that males had a slightly higher prevalence of wasting (6.1%) compared to females (5.8%) (Table 55 and Figure 74). While these differences were not significant, it does appear that females had a higher prevalence of moderate wasting (3.9% vs 0.3%), while males had a higher prevalence if severe wasting (5.8% vs 1.9%).

Gert Sibande reported the highest overall prevalence of wasting (10.6%), while Nkangala reported the lowest overall prevalence (3.8%); however, there were no significant differences reported at a district level for all categories of wasting (Table 55 and Figure 75).

Table 55: The prevalence of Wasting in children under 5 years in Mpumalanga by age, sex, and district

	No wasting WHZ>=-2		All wasting WHZ<-2		Moderate wasting WHZ<-2 and >=-3		Severe wasting WHZ<-3		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)									
<6	*		*		*		*		**25#**
6-17	96.3	[83.2-99.3]	3.7	[0.7-16.8]	0.5	[0.1-4.1]	3.1	[0.5-18.2]	85
18-29	98.5	[92.8-99.7]	1.5	[0.3-7.2]	1.5	[0.3-7.2]	0.0	[0.0-0.0]	73
30-41	99.2	[96.2-99.8]	0.8	[0.2-3.8]	0.2	[0.0-1.7]	0.6	[0.1-4.3]	77
42-53	93.3	[75.9-98.4]	6.7	[1.6-24.1]	5.6	[1.1-24.8]	1.1	[0.1-7.6]	70
54-59	96.7	[84.7-99.4]	3.3	[0.6-15.3]	0.0	[0.0-0.0]	3.3	[0.6-15.3]	36

Gender									
Female	94.2	[86.3-97.6]	5.8	[2.4-13.7]	3.9	[1.2-12.0]	1.9	[0.5-7.2]	174
Male	93.9	[84.5-97.7]	6.1	[2.3-15.5]	0.3	[0.1-1.8]	5.8	[2.0-15.4]	192
District									
Gert Sibande	89.4	[78.9-95.0]	10.6	[5.0-21.1]	3.3	[0.5-18.5]	7.2	[2.8-17.2]	101
Nkangala	96.2	[84.3-99.2]	3.8	[0.8-15.7]	0.3	[0.0-2.3]	3.6	[0.7-16.0]	128
Ehlanzeni	95.2	[86.7-98.4]	4.8	[1.6-13.3]	3.8	[1.0-13.2]	1.0	[0.2-4.1]	137
Total	**94.0**	**[88.4-97.0]**	**6.0**	**[3.0-11.6]**	**2.0**	**[0.6-5.8]**	**4.0**	**[1.6-9.5]**	**366**

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

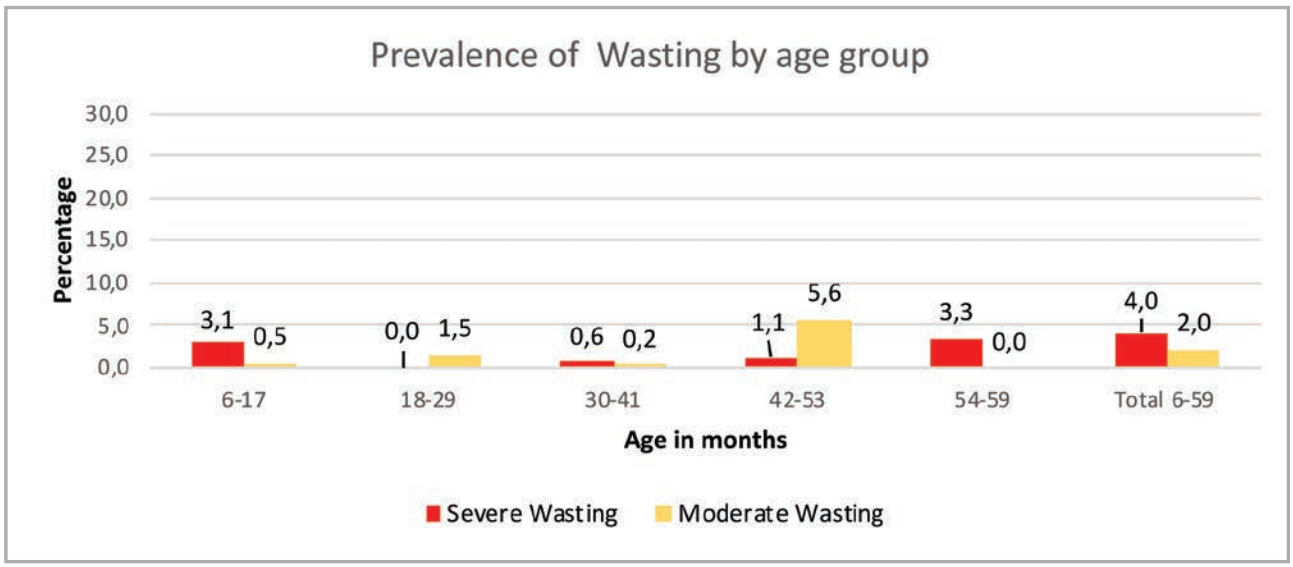


Figure 73: *The prevalence of Wasting in children under 5 years in Mpumalanga by age group*

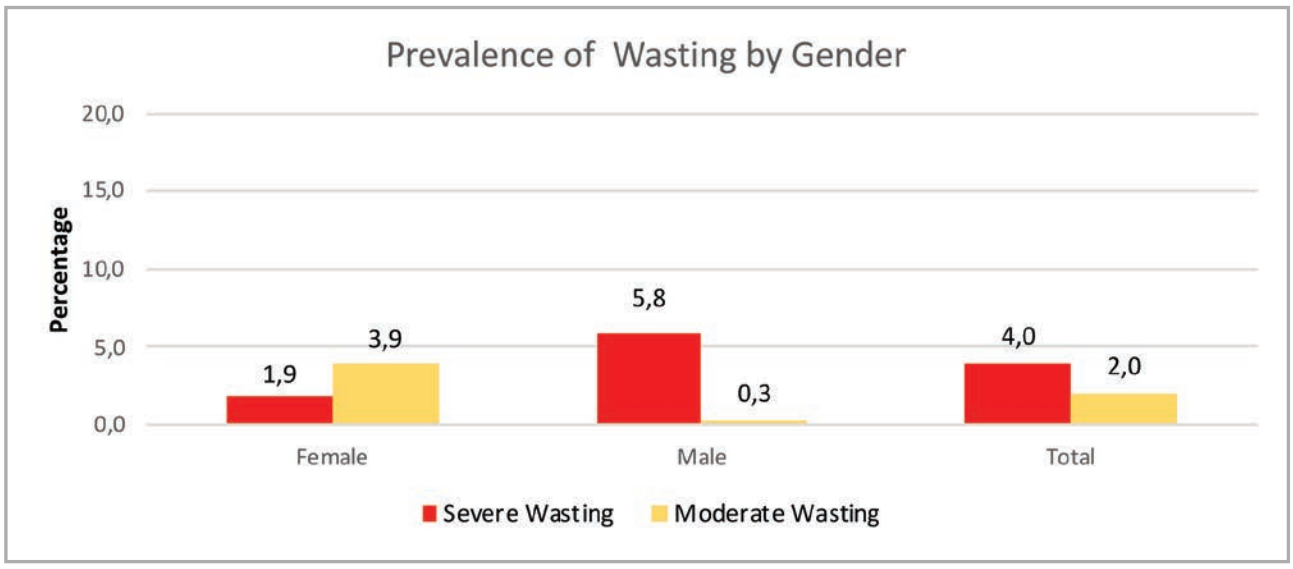


Figure 74: *The prevalence of Wasting in children under 5 years in Mpumalanga by gender*

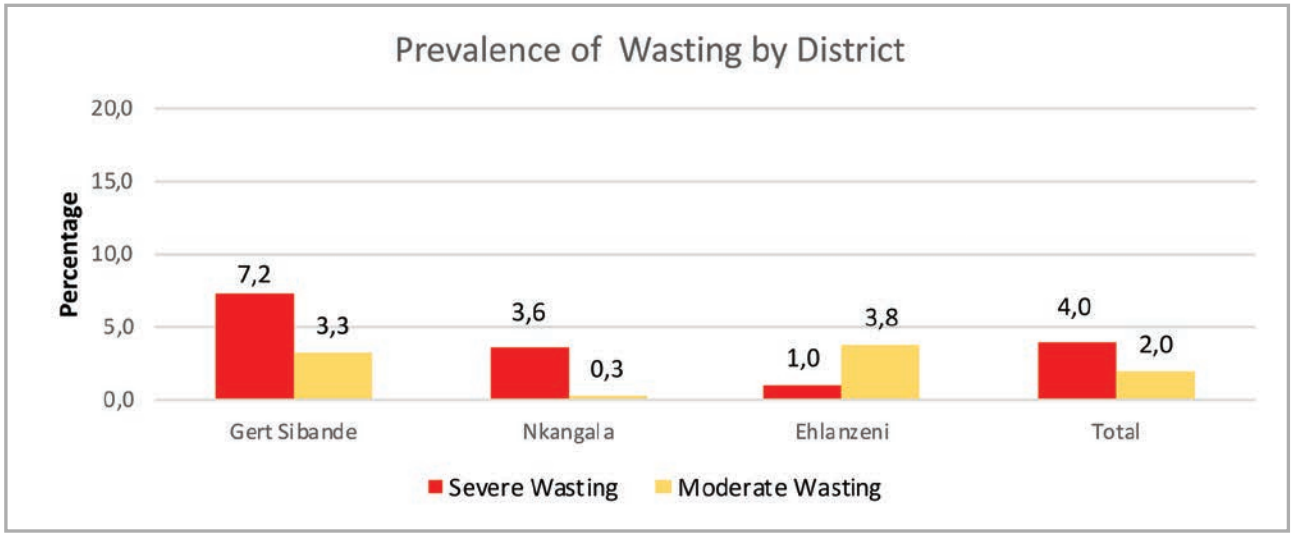


Figure 75: *The prevalence of Wasting in children under 5 years in Mpumalanga by district*

8.1.2.3 Underweight

The overall prevalence of underweight for children under the age of 5 years (n=395) was 9.4%, of which 1.8% was severe and 7.6% was moderate underweight (Table 56 and Figure 76). As with stunting and wasting results for children aged 0-6 months cannot be shown reliably due to the small sample size. The prevalence of overall, underweight, and moderate underweight was highest in children aged 30-41 months at 16.2% and 15.6%, respectively, while that of severe underweight was highest in those aged 54-59 months (2.8%). There were, however, no significant differences in all categories of underweight across age groups.

The prevalence of overall underweight in males and females was evenly distributed at 9.2% and 9.7%, respectively (Table 56 and Figure 77). Amongst these, moderate underweight was more common in both genders than severe underweight.

Like wasting, Gert Sibande also reported the highest overall prevalence of underweight (18.5%), which was significantly different to that of Ehlanzeni, who reported the lowest overall prevalence (2.9%) (Table 56 and Figure 78).

Table 56: The prevalence of Underweight in children under 5 years in Mpumalanga by age, sex, and district

	Not underweight WAZ>=-2		All Underweight WAZ<-2		Moderate underweight WAZ<-2 and >=-3		Severe underweight WAZ<-3		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)									
<6	*		*		*		*		27#
6-17	90.7	[72.5-97.3]	9.3	[2.7-27.5]	9.3	[2.7-27.5]	0.0	[0.0-0.0]	94
18-29	97.3	[88.3-99.4]	2.7	[0.6-11.7]	0.4	[0.0-2.8]	2.3	[0.4-12.3]	81
30-41	83.8	[51.5-96.2]	16.2	[3.8-48.5]	15.6	[3.5-48.7]	0.6	[0.1-4.2]	80
42-53	98.2	[92.4-99.6]	1.8	[0.4-7.6]	1.8	[0.4-7.6]	0.0	[0.0-0.0]	73
54-59	95.8	[85.4-98.9]	4.2	[1.1-14.6]	1.4	[0.2-10.0]	2.8	[0.6-13.2]	40

Gender									
Female	90.3	[72.9-97.0]	9.7	[3.0-27.1]	7.6	[1.7-27.6]	2.2	[0.7-6.9]	188
Male	90.8	[80.5-96.0]	9.2	[4.0-19.5]	7.7	[3.0-18.3]	1.5	[0.4-5.6]	207
District									
Gert Sibande	81.5	[63.2-91.9]	18.5	[8.1-36.8]	14.1	[4.3-37.7]	4.4	[0.9-19.3]	106
Nkangala	92.7	[81.3-97.3]	7.3	[2.7-18.7]	7.3	[2.7-18.7]	0.0		139
Ehlanzeni	97.1	[93.1-98.8]	2.9	[1.2-6.9]	0.5	[0.1-2.1]	2.4	[0.8-6.7]	150
Total	**90.6**	**[81.6-95.4]**	**9.4**	**[4.6-18.4]**	**7.6**	**[3.2-17.2]**	**1.8**	**[0.5-5.7]**	**395**

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

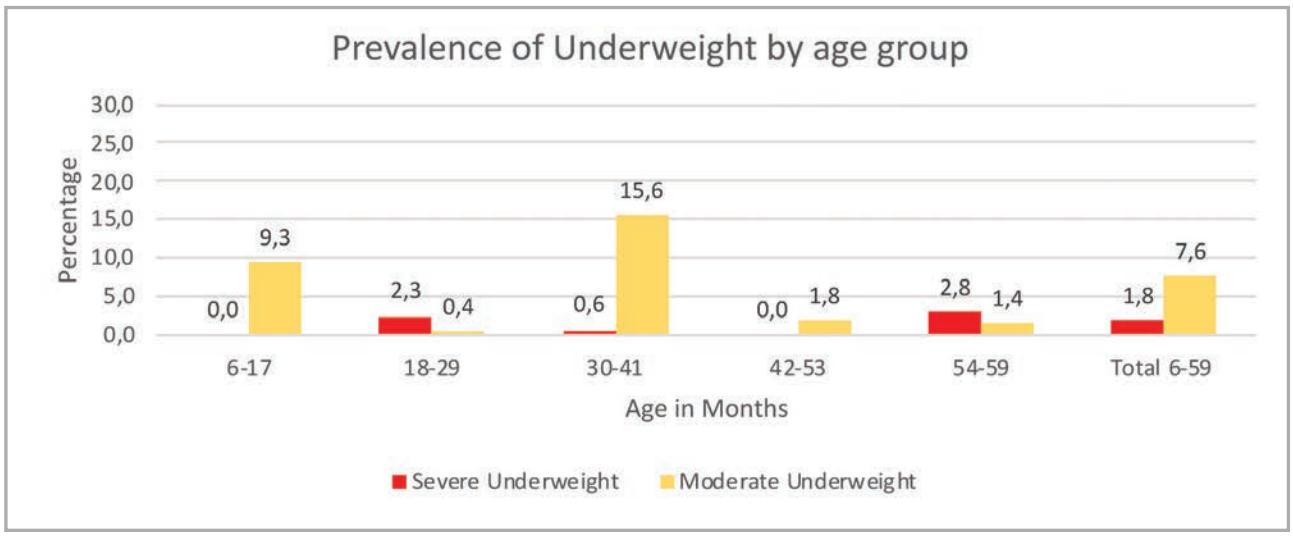


Figure 76: *The prevalence of Underweight in children under 5 years in Mpumalanga by age group*

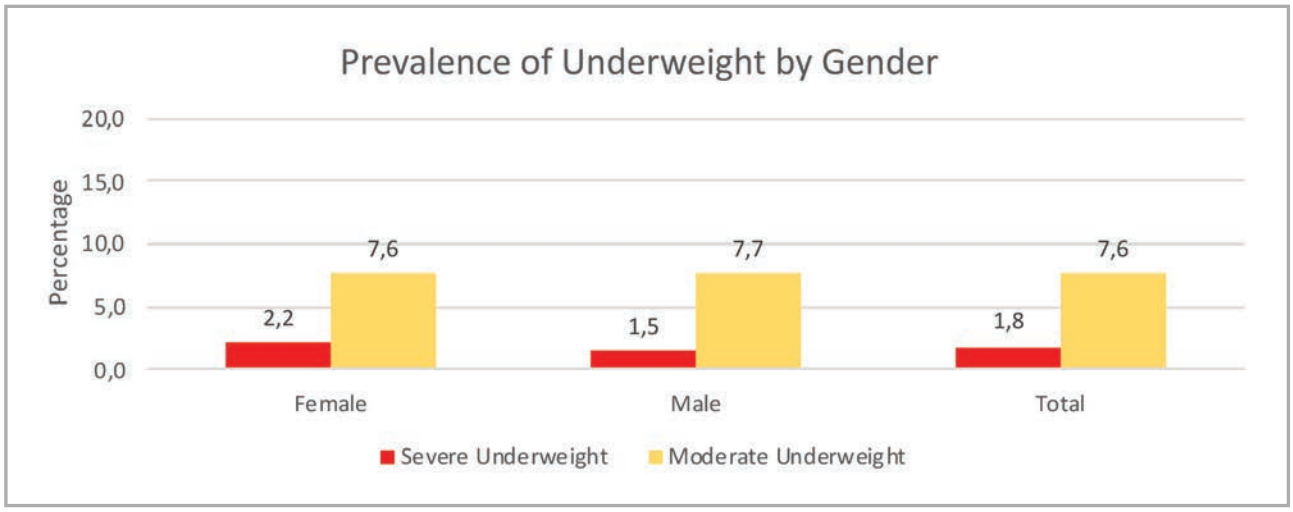


Figure 77: *The prevalence of Underweight in children under 5 years in Mpumalanga by gender*

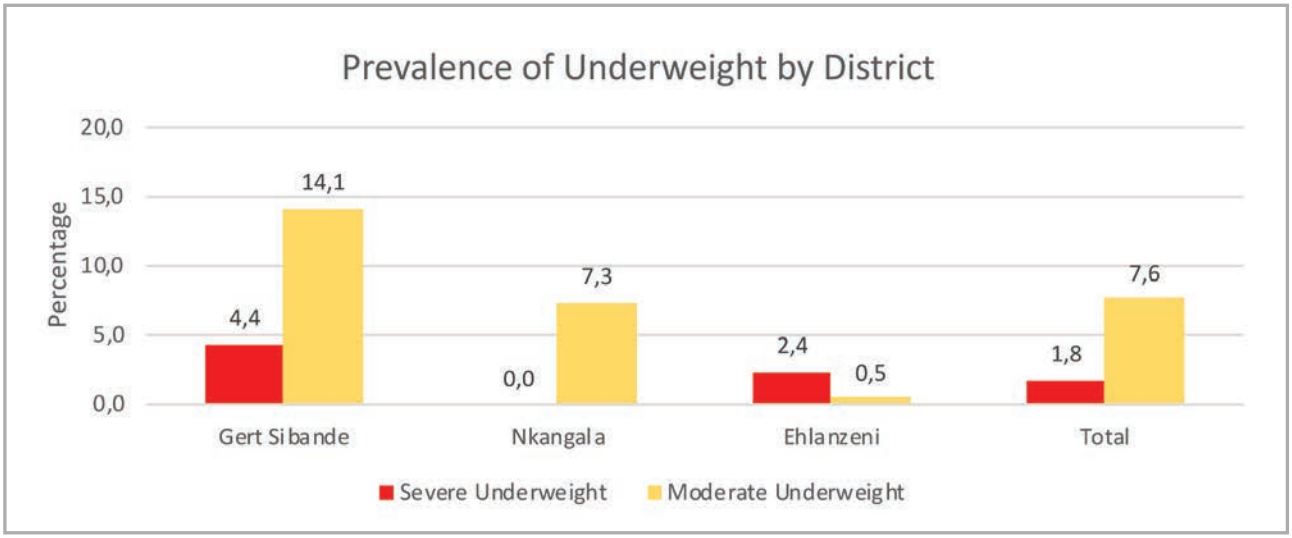


Figure 78: *The prevalence of Underweight in children under 5 years in Mpumalanga by district*

8.1.2.4 Overweight

The overall prevalence of overweight for children under the age of 5 years (n=366) was 21.2%, of which 13.2% was severe and 8.0% was moderate overweight (Table 57 and Figure 79). As with the previous indicators, results for children aged 0-6 months cannot be shown reliably due to the small sample size. The prevalence of all categories of overweight (all, moderate, and severe) was highest in children in the youngest three age groups; 6-17 months (30.8%, 12.9%, 17.9%), 18-29 months (20.3%, 9.1%, 11.3%) and 30-41 months (21.0%, 13.4%, 7.6%) compared to the older two age groups (4.1%, 0.0%, 4.1%) and 54-59 months (0.8%, 0.4%, 0.4%). There were significant differences in the prevalence of overweight between younger and older age groups.

Females had a higher prevalence of overweight (24.6%) compared to males (18.3%) (Table 57 and Figure 80). While these differences were not significant, it does appear that females had a higher prevalence of severe overweight (17.5% vs 9.7%), while males had a higher prevalence if moderate overweight (8.7% vs 7.1%).

Nkangala reported the highest overall prevalence of overweight (26.4%), while Ehlanzeni reported the lowest overall prevalence (14.7%); however, there were no significant differences in overweight reported at a district level (Table 57 and Figure 81).

Table 57: The prevalence of Overweight in children under 5 years in Mpumalanga by age, sex, and district

	Not overweight WHZ<2		All overweight WHZ>=2		Moderate overweight WHZ>=2 and <3		Severe overweight WHZ>=3		
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	n
Age (months)									
<6	*		*		*		*		25#
6-17	69.2	[52.2-82.3]	30.8	[17.7-47.8]	12.9	[5.5-27.4]	17.9	[8.2-34.9]	85
18-29	79.7	[61.8-90.5]	20.3	[9.5-38.2]	9.1	[3.0-24.4]	11.3	[4.7-24.7]	73
30-41	79.0	[49.7-93.5]	21.0	[6.5-50.3]	13.4	[2.0-53.9]	7.6	[2.9-18.7]	77
42-53	95.9	[84.6-99.0]	4.1	[1.0-15.4]	0.0	[0.0-0.0]	4.1	[1.0-15.4]	70
54-59	99.2	[96.7-99.8]	0.8	[0.2-3.3]	0.4	[0.0-3.2]	0.4	[0.1-2.7]	36

Gender									
Female	75.4	[62.8-84.8]	24.6	[15.2-37.2]	7.1	[2.8-17.0]	17.5	[10.0-28.8]	174
Male	81.7	[64.9-91.5]	18.3	[8.5-35.1]	8.7	[2.9-23.0]	9.7	[5.5-16.5]	192
District									
Gert Sibande	82.5	[61.5-93.3]	17.5	[6.7-38.5]	4.3	[0.5-27.5]	13.2	[4.6-32.1]	101
Nkangala	73.6	[55.7-86.0]	26.4	[14.0-44.3]	10.4	[3.6-26.6]	16.1	[9.8-25.1]	128
Ehlanzeni	85.3	[71.5-93.1]	14.7	[6.9-28.5]	7.4	[2.2-22.6]	7.2	[2.6-18.6]	137
Total	**78.8**	**[66.9-87.2]**	**21.2**	**[12.8-33.1]**	**8.0**	**[3.4-17.6]**	**13.2**	**[8.4-20.2]**	**366**

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

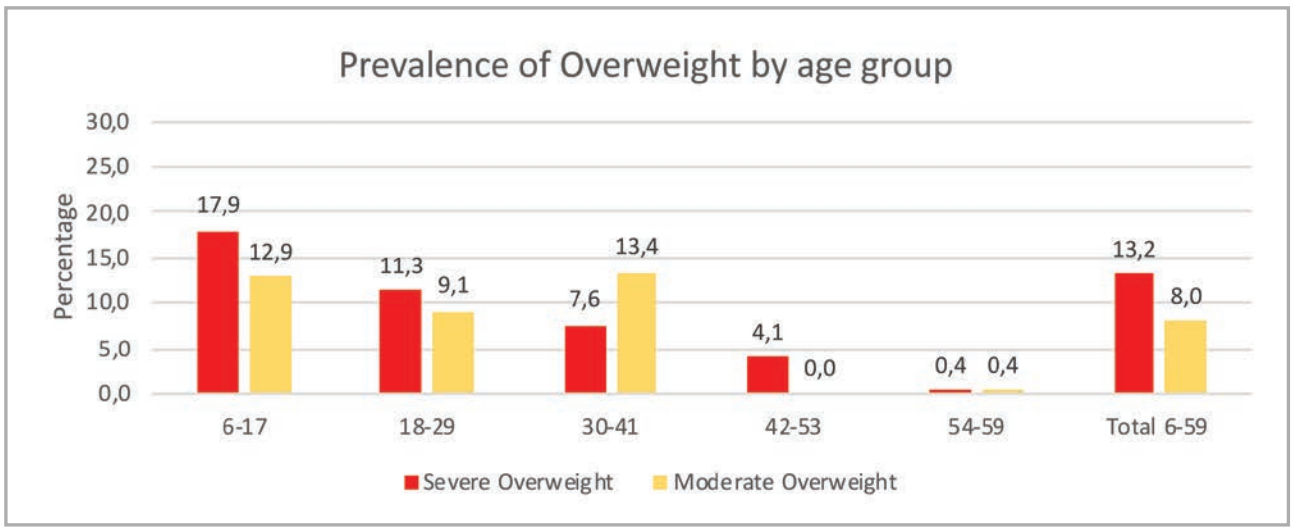


Figure 79: *The prevalence of Overweight in children under 5 years in Mpumalanga by age group*

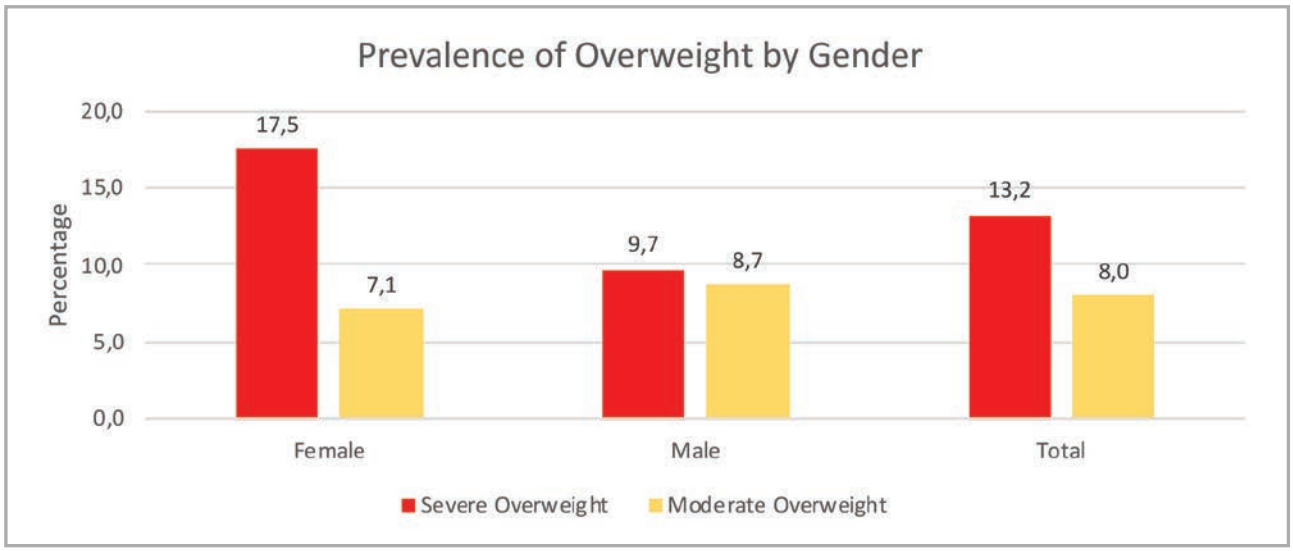


Figure 80: *The prevalence of Overweight in children under 5 years in Mpumalanga by gender*

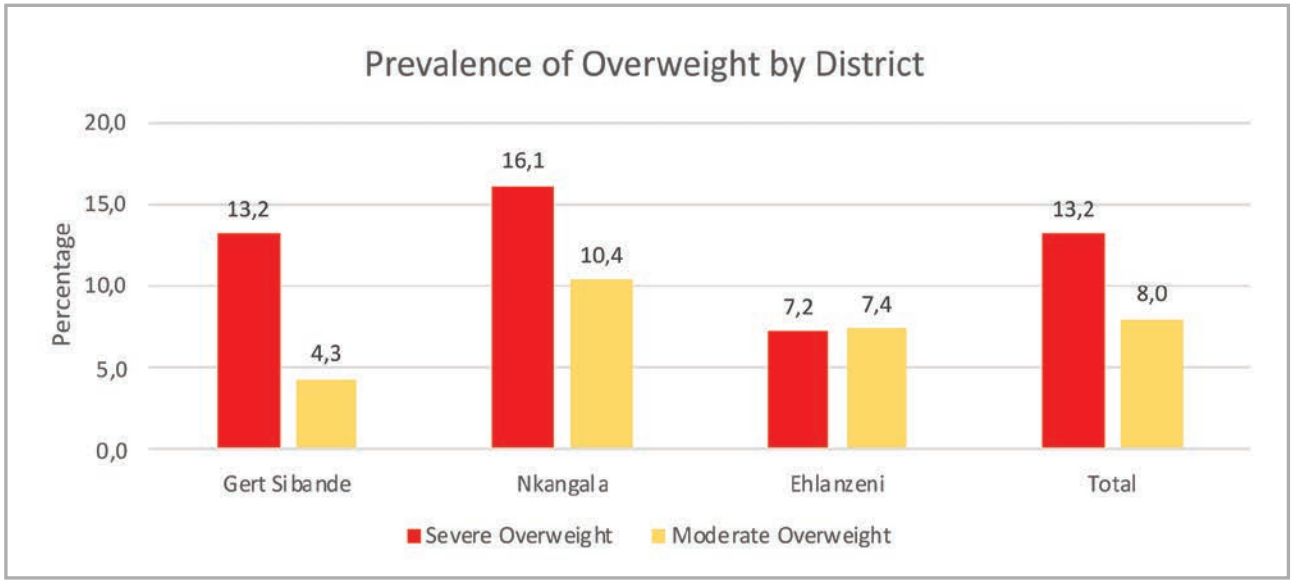


Figure 81: *The prevalence of Overweight in children under 5 years in Mpumalanga by district*

8.2 Anthropometry (18 years and older)

8.2.1 Body Mass Index (BMI)

The mean BMI for adults aged 18 years and older (n=1296) in Mpumalanga was 28.0 kg/m^2. This was significantly different between males (24.1 kg/m^2; 95%CI 23.0-25.1) and females (30.0 kg/m^2; 95% CI 28.8-31.1). There were also significant differences in BMI between individuals of different age groups, with those aged 18-24 years having a significantly lower mean BMI (24.4 kg/m^2) than those aged 25 years and older (range 27.9-30.8 kg/m^2). There were no significant differences between any of the other age groups. At a district level, Gert Sibande reported a significantly higher mean BMI (28.7 kg/m^2) than Ehlanzeni (26.4 kg/m^2); however, there was no significant differences between Gert Sibande and Nkangala.

Overall, more than 50% were classified as either overweight (25.7%) or obese (31.7%). Less than 40% (37.5%) were classified normal weight and 5.1% were classified as underweight (Figure 82).

When disaggregating by gender (Males n=426. Females n=869), the proportion of both overweight (17.6% vs 29.7%) and obesity (12.5 % vs 41.2%) is higher in females than in males, respectively (Figure 83). While 10% more females are overweight, nearly 30% more females are obese compared to males. Conversely, the prevalence of underweight in females (3.8%) is about half of that in males (7.7%). While the results for obesity and normal weight are significantly different between the genders, the results for underweight and overweight are not significantly different.

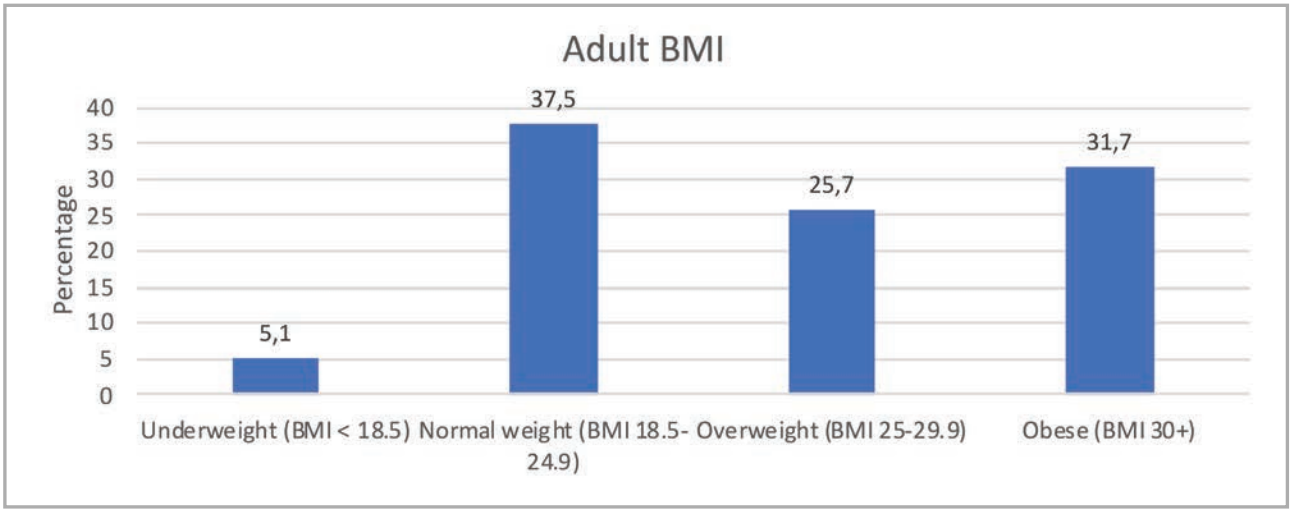


Figure 82: *Distribution of BMI in adults aged 18 years and older across all districts in Mpumalanga*

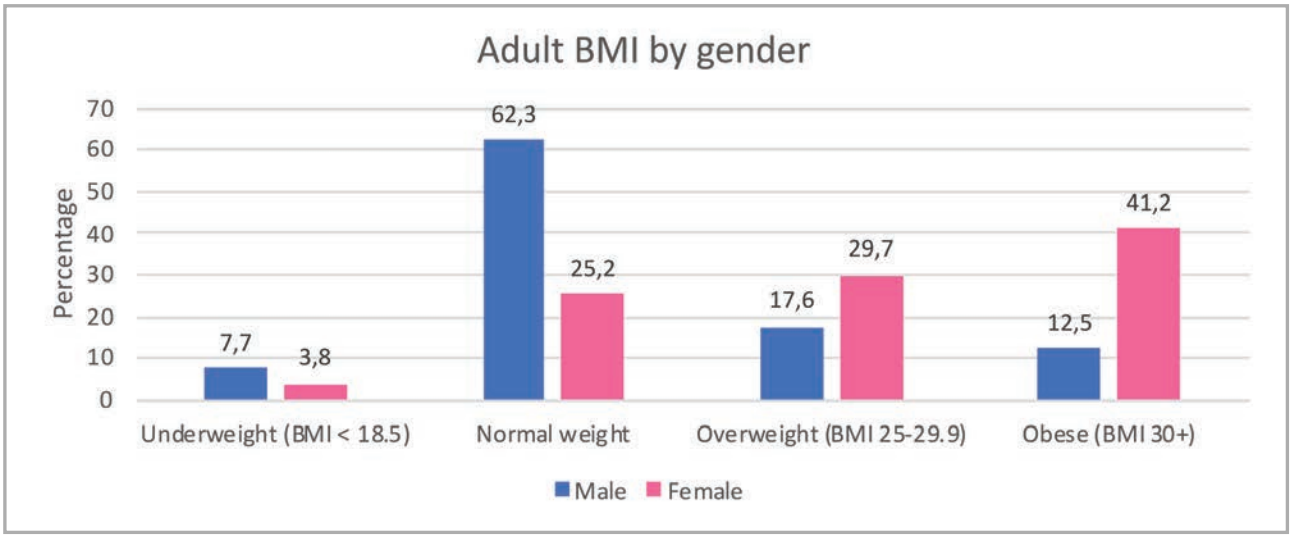
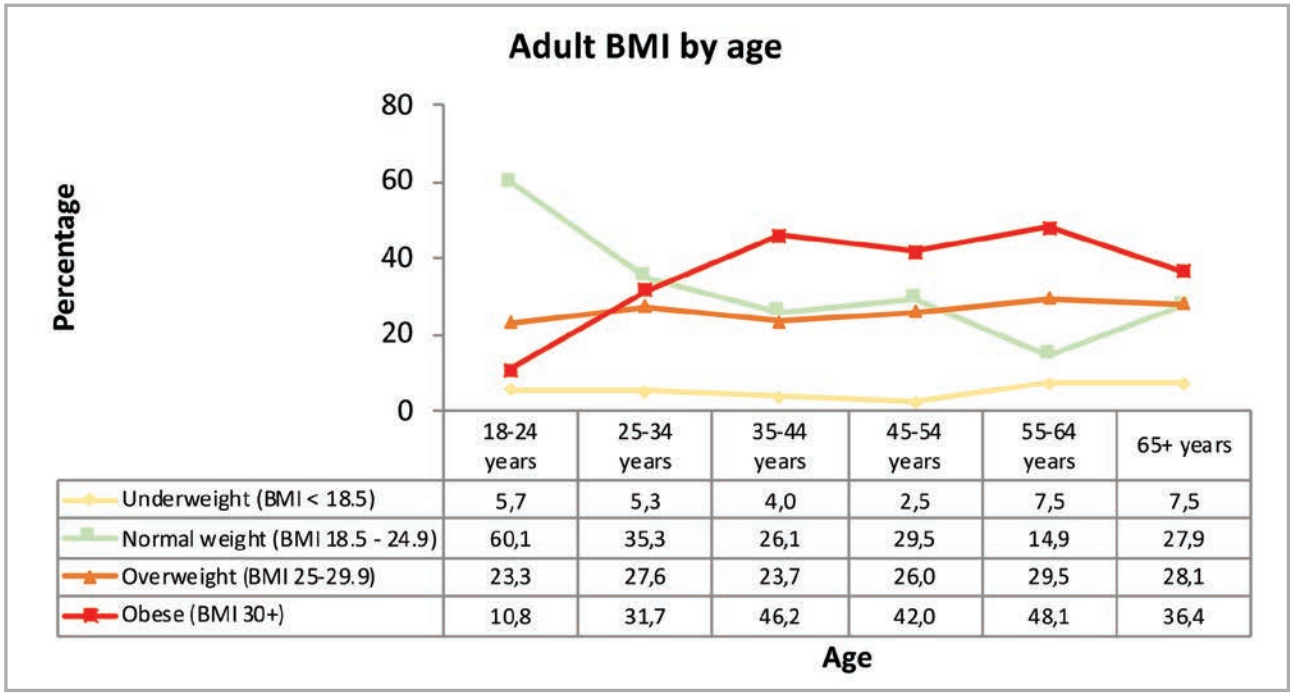


Figure 83: *Distribution of BMI in adults aged 18 years and older by gender in Mpumalanga*

When disaggregating the overall adult population by age, those aged 55+ years have the highest prevalence of overweight, while those aged 35-44 years (46.2%) and 55-64 years (48.1%) have the highest prevalence of obesity (Figure 84). There was a significant difference in the prevalence of obesity between the 18-24-year age group (10.8%) and all other age groups (range: 31.7%-48.1%). The prevalence of underweight ranged from 2.5%-7.5% across all age groups, with no significant differences between them.

Figure 85 compares BMI differences by age group between males and females. These figures clearly illustrate that underweight is lower in females (1.6%-4.8%) than males (3.1%-19.6%) across all age categories. Conversely, both overweight (20.7%-40.9% vs 3.9%-40.3%) and obesity (19.5%-58.5% vs 1.2%-28.7%) is higher in females than males across all age categories, respectively.



	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65+ years
Underweight (BMI < 18.5)	5,7	5,3	4,0	2,5	7,5	7,5
Normal weight (BMI 18.5 - 24.9)	60,1	35,3	26,1	29,5	14,9	27,9
Overweight (BMI 25-29.9)	23,3	27,6	23,7	26,0	29,5	28,1
Obese (BMI 30+)	10,8	31,7	46,2	42,0	48,1	36,4

Figure 84: *Distribution of BMI in adults aged 18 years and older by age categories in Mpumalanga*

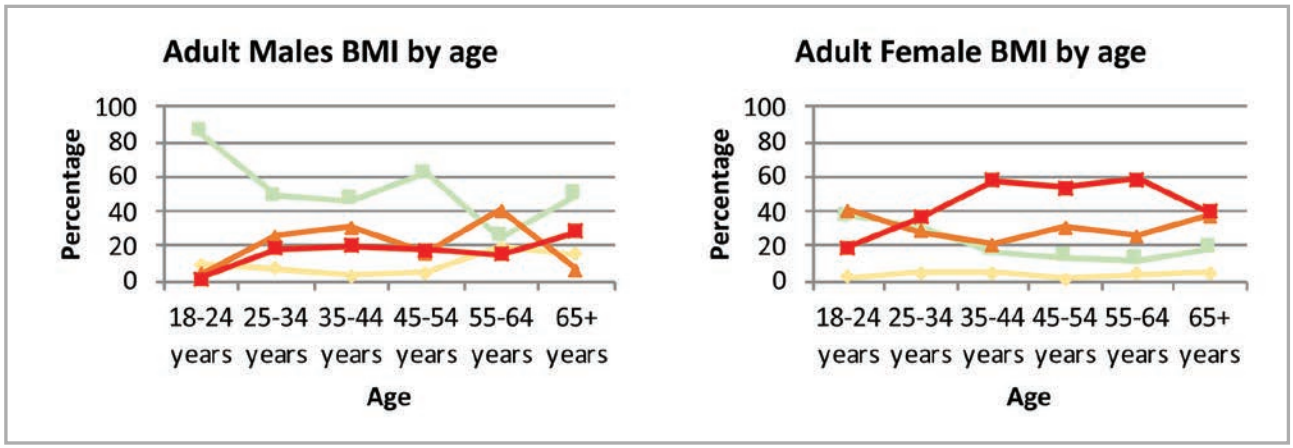


Figure 85: *Comparison of the distribution of BMI in adults aged 18 years and older by age and gender in Mpumalanga*

Figure 86 shows disaggregation of BMI by district level and indicates that BMI categories are similar across all districts, with no significant differences between them. Figure 87 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. Generally, there are, however, no significant differences in overweight and obesity between districts for both males and females, except for obesity in females, where Nkangala (52.2%) had a significantly higher prevalence than Ehlanzeni (29.8%).

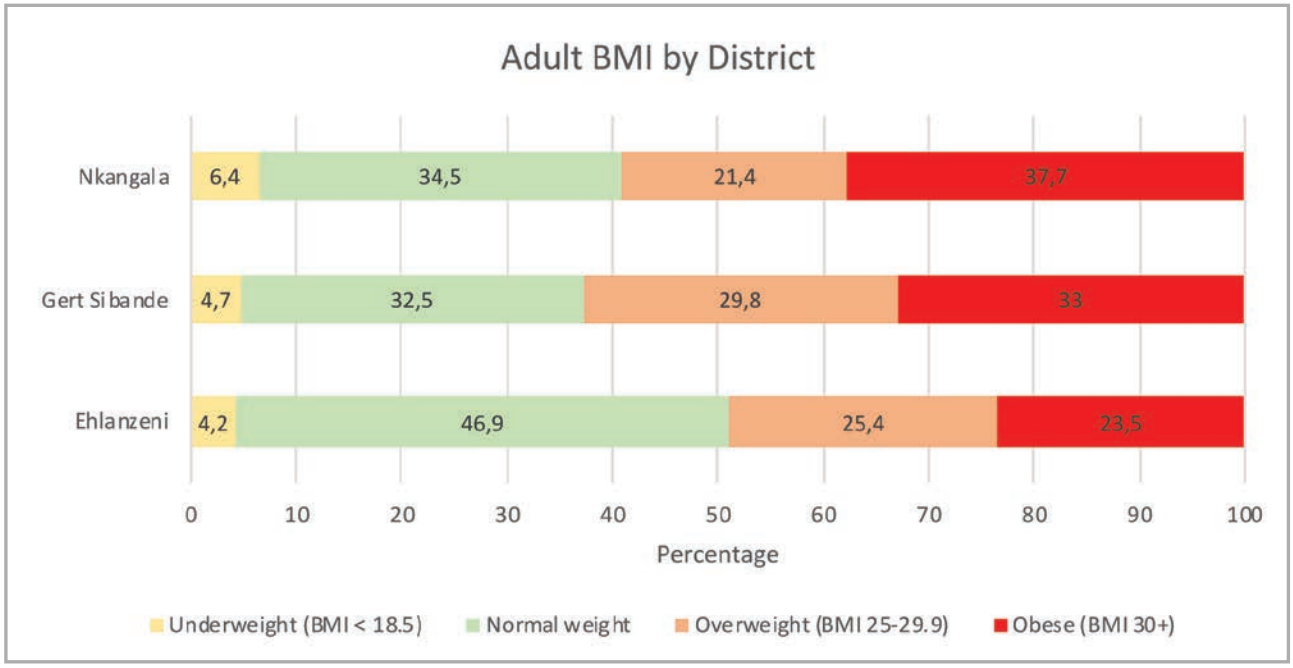


Figure 86: *Comparison of the distribution of BMI in adults aged 18 years and older by districts in Mpumalanga*

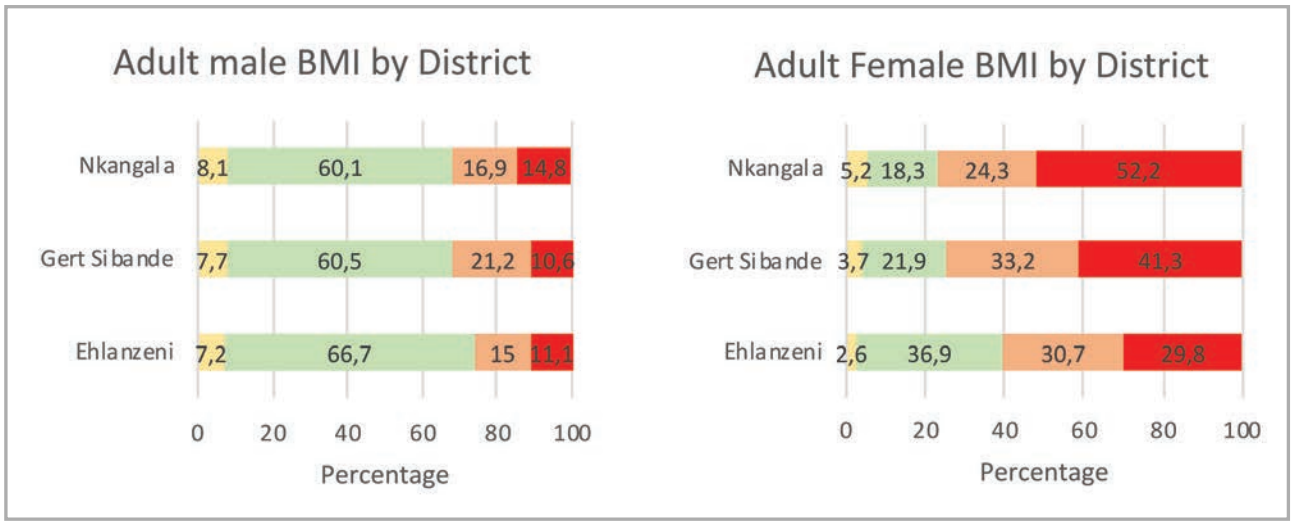


Figure 87: *Comparison of the distribution of BMI in adults aged 18 years and older by districts and gender in Mpumalanga*

8.2.2 Waist Hip Ratio

A waist hip ratio (WHR) ≥ 1 in males and ≥ 0.85 in females is indicative of increased risk of non-communicable diseases (NCDs) such as diabetes and hypertension amongst other illnesses. The mean waist hip ratio for males (n=431) and females (n=889) was 0.88 (range: 0.79-0.95) and 0.85 (range: 0.81-0.95), respectively. However, Table 58 clearly shows that overall, a far greater proportion of females (46.7%) had a high WHR compared to only 9.3% of males.

Table 58: Waist hip ratio (WHR) of adults aged 18 years and older in Mpumalanga by gender, age, and district

	Males					Females				
	Waist-hip ratio		Waist hip ratio>=1			Waist-hip ratio		Waist hip ratio >= 0.85		
	Mean	95% CI	%	95% CI	n	Mean	95% CI	%	95% CI	n
Age group										
18-24	0.79	[0.77-0.82]	0		63	0.81	[0.77-0.86]	28.5	[11.7-54.5]	86
25-34	0.95	[0.82-1.09]	10.7	[3.9-26.0]	85	0.82	[0.80-0.84]	39.4	[28.7-51.3]	209
35-44	0.91	[0.88-0.94]	15.6	[6.7-32.4]	89	0.86	[0.84-0.88]	46.9	[37.4-56.5]	185
45-54	0.92	[0.88-0.97]	14.1	[5.8-30.4]	78	0.88	[0.86-0.90]	65.5	[53.1-76.0]	162
55-64	0.95	[0.92-0.98]	23.7	[11.0-43.8]	55	0.92	[0.89-0.95]	75.8	[60.7-86.3]	130
>=65	0.94	[0.91-0.97]	30.7	[17.9-47.5]	61	0.95	[0.92-0.98]	85.2	[75.7-91.4]	117
District										
Ehlanzeni	0.85	[0.83-0.86]	3.2	[1.5-6.7]	186	0.84	[0.82-0.87]	45.0	[31.0-59.9]	356
Gert Sibande	0.92	[0.80-1.03]	13.0	[6.7-23.8]	109	0.84	[0.81-0.87]	44.4	[33.8-55.6]	248
Nkangala	0.88	[0.83-0.93]	11.4	[5.5-22.0]	136	0.86	[0.83-0.88]	50.8	[41.9-59.7]	285
Total	0.88	[0.84-0.92]	9.3	[6.0-14.3]	431	0.85	[0.83-0.86]	46.7	[39.8-53.7]	889

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

Table 58 and Figure 88 illustrate that WHR tends to increase with age in males and females peaking in the age group 65 years and older. There were no significant differences between age groups in males; however, in females there was a significant difference between the two older age groups (55+ years) and the three younger age groups (18-44 years).

There were no significant differences in the mean WHR and the proportion of those who had a high WHR among both males and females across the various districts in Mpumalanga.

Males in Ehlanzeni had the lowest prevalence of an increased WHR (3.2%) compared to the other two districts who had an average of more than four times the prevalence (11.4%-13.0%) (Figure 89), with those in Gert Sibande having the highest prevalence (13.0%). These differences were, however, not significant across districts. While nearly 50% of females across all districts had an increased WHR, those in Gert Sibande had the lowest prevalence (44.4%) compared to females in Nkangala (50.8%) who had the highest prevalence. However, this too was not significant.

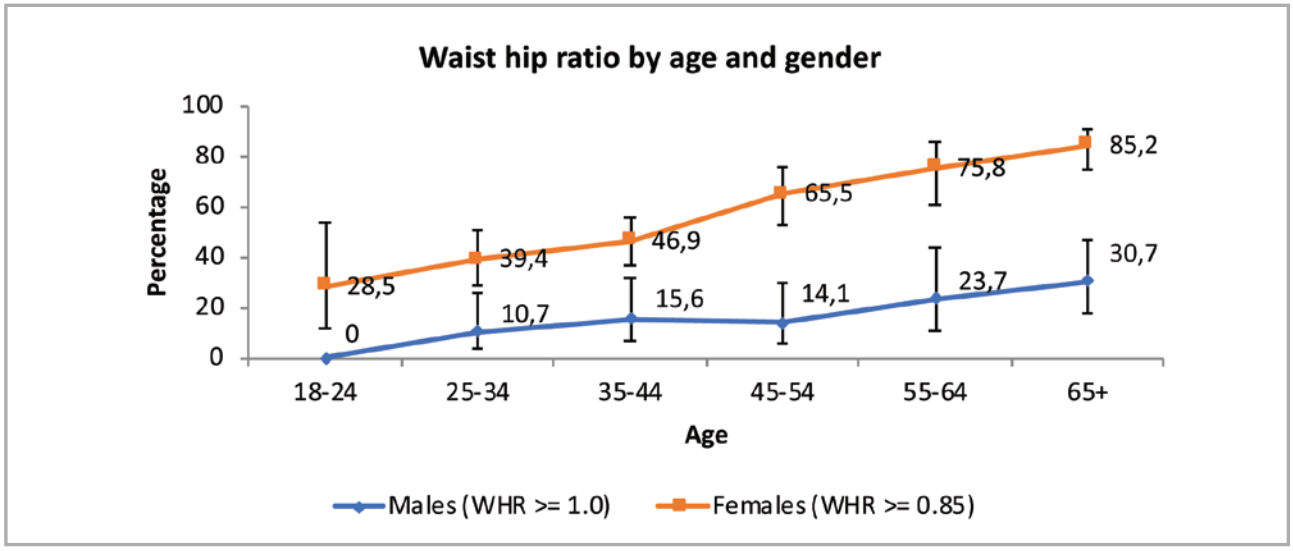


Figure 88: *Comparison of the distribution of WHR in adults aged 18 years and older by age and gender in Mpumalanga*

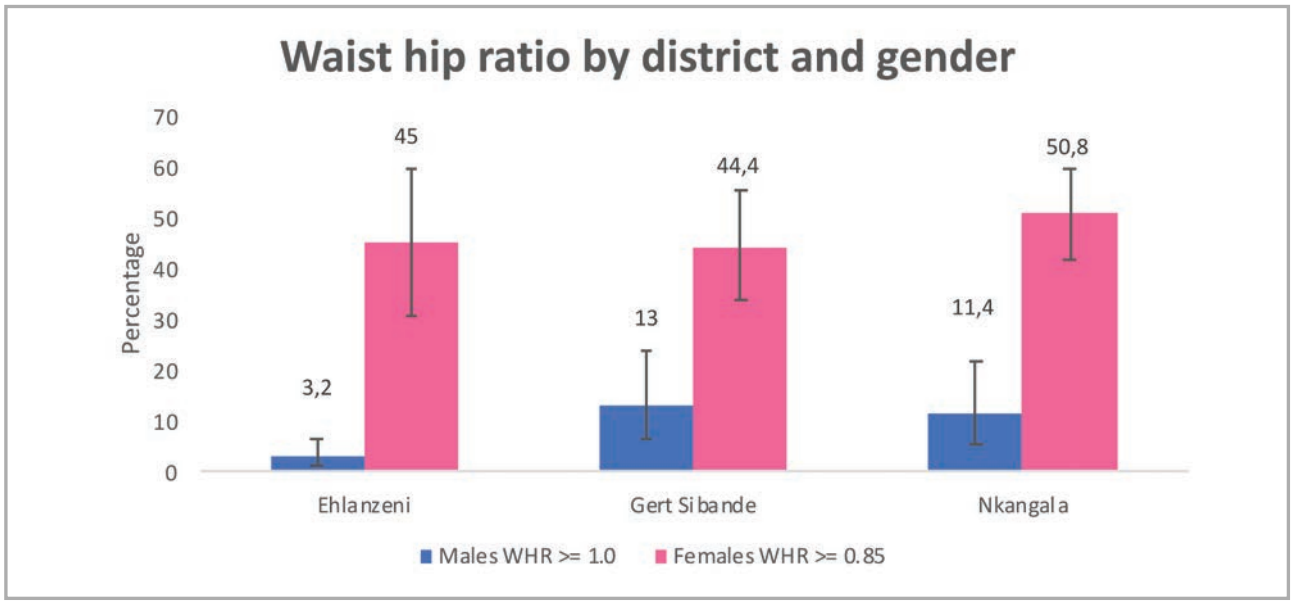


Figure 89: *Comparison of the distribution of WHR in adults aged 18 years and older by districts and gender in Mpumalanga*

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 - 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 low and to be associated with dietary inadequacies (Steyn et al., 2006).

The mean dietary diversity score (DDS) for individuals residing in Mpumalanga (n=429) was 4.86, which is indicative of an adequate dietary diversity (Table 59). District comparisons showed that Ehlanzeni had the highest mean DDS (5.09) compared Gert Sibande which had the lowest (4.61). The table further shows that individuals in all districts reported an adequate DDS (>4). We were unable to differentiate between DDS scores for adults and children.

Table 59: Mean dietary diversity scores for individuals in Mpumalanga

	Dietary Diversity Score (DDS)		
	Mean	**95% CI**	**n**
District			
Ehlanzeni	5.09	[4.64-5.53]	149
Gert Sibande	4.61	[4.00-5.22]	120
Nkangala	4.93	[3.94-5.91]	160
Total	**4.86**	**[4.33-5.39]**	**429**

Figure 90 illustrates the proportion of the population in Mpumalanga and in the various districts who have low and acceptable DDS. About 68.2% of individuals in Mpumalanga reported an adequate DDS, while 31.8% have a low DDS. Ehlanzeni reported the lowest proportion of people with low DDS (22.5%), while Gert Sibande reported the highest proportion of people with a low DDS (40.6%).

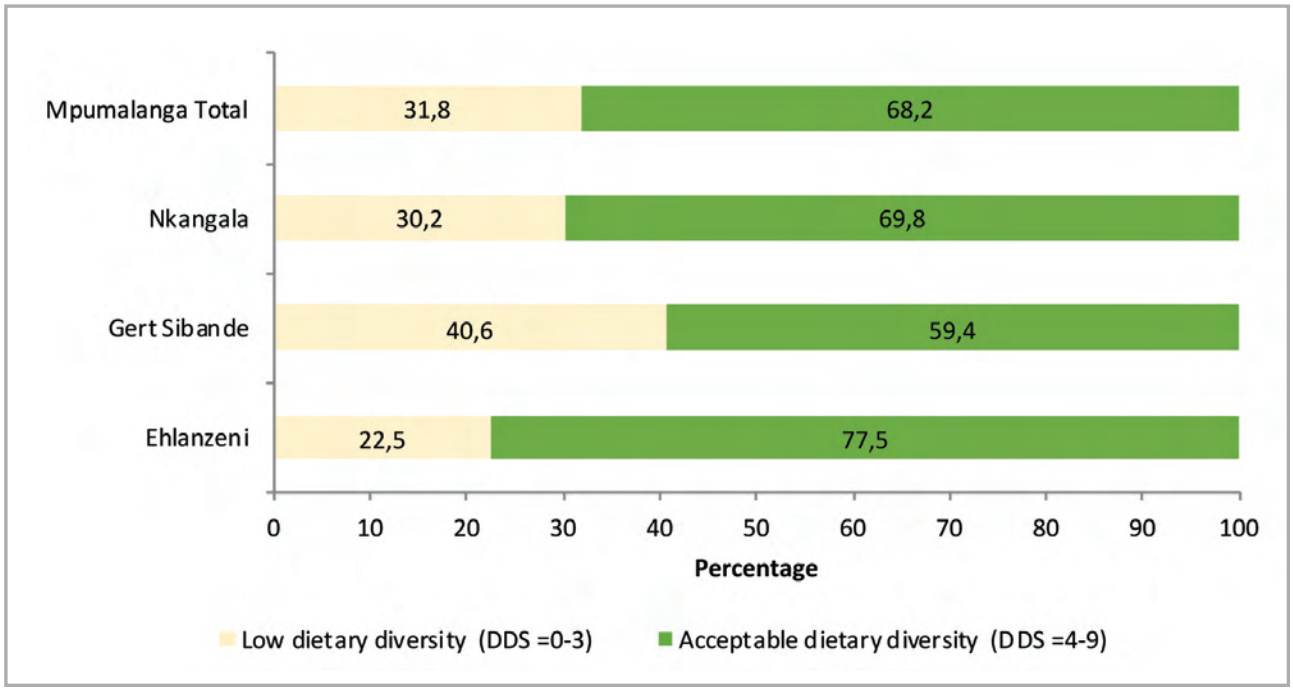


Figure 90: *Comparison of the distribution of DDS in individuals in Mpumalanga by districts*

8.4 Relationship of Household Food Insecurity and Malnutrition

Table 60 presents the associations between nutrition indicators and food security status, based on the Household Food Insecurity Access Scale (HFIAS). In Mpumalanga, there was no significant relationships between food security and all four of the nutrition indicators (stunting, wasting, underweight, and overweight) for children aged 0-5 years. However, the trend in the table shows that the prevalence of household food insecurity was higher among households that had at least one child under 5 years who was stunted (83.1%), underweight (91.0%) and overweight (85.3%) than among households that did not have a child under 5 years who was stunted (76.7%), underweight (77.7%), and overweight (77.3%). These results suggest that

household food insecurity is associated with higher chances of chronic undernutrition. On the other hand, the results also suggest that households with access to food are not eating the right food, resulting in overweight among children.

For adults, there was no significant relationship between household food security and an elevated waist hip-ratio (WHR), which 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. There was also no significant relationship between household food insecurity and obesity/overweight. There were however significant relationships between food security and two of the nutrition indicators for adults. The prevalence of household food insecurity was higher among households that had at least one adult who was underweight (92.3%) than among households that did not have an underweight adult (71.6%) ($p<0.001$). Similarly, the prevalence of food insecurity was significantly higher (90.4%) 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 (69.9%) ($p<0.001$).

Table 60: Relationship between Household Food Insecurity and Malnutrition indicators in Mpumalanga

Nutrition indicators	Categories	Food security status (%)		Chi-square tests
		Food secure	Food insecure	
0-5 years				
Stunting	Yes	16.9	83.1	
	No	23.3	76.7	
Wasting	Yes	23.4	76.6	
	No	20.8	79.2	
Underweight	Yes	9.0	91.0	
	No	22.3	77.7	
Overweight	Yes	14.7	85.3	
	No	22.7	77.3	
Adults				
Underweight	Yes	7.7	92.3	***
	No	28.4	71.6	
Obesity / Overweight	Yes	28.4	71.6	
	No	25.3	74.7	
Increase risk of NCDs (Waist / hip ratio)	Yes	26.7	73.3	
	No	27.8	72.2	
Individual Dietary Diversity	Low	9.6	90.4	***
	Acceptable	30.1	69.9	

* 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).

8.5 Discussion

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 result of the current study indicates that 82.3% of children under 2 years were breastfed at some point in their lives, is very similar to the national results reported in the SADHS in 2016 (84%). Furthermore, the results of the current study indicated that 86.9% of children aged 0-2 years in Mpumalanga were introduced to breastfeeding immediately after birth with a total of 93.1% being breastfed within an hour of birth. These results are higher than the national results reported by the SAHANES in 2012 (83.0%) and far higher than those reported in the SADHS in 2016 (67%).

Exclusive breastfeeding in Mpumalanga was reported to be 27.8%. This should be interpreted with caution due to the small sample size. However, 27.8% is much higher than the national reports in the 2003 SADHS (8.3%) and SANHANES 2012 (7.5%) and more closely related to 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 Mpumalanga was 7.8 months), which is 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 0-1months. This occurred in about 66.0% of children. It can be assumed that this is most likely the introduction of infant formula, for mothers who may be unable to breastfeed. With regards to the type of drink that was first introduced, 34.7% indicated infant formula while 23.1% 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, results of this study indicate that complementary feeding is initiated earlier than the anticipated 6 months, at 4.9 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 40.7% in Mpumalanga. Four years later in 2016, the SADHS reported a slightly lower stunting prevalence at the national level (27.0%), but a far lower prevalence at the provincial levels (22%). The results of the current study appear to indicate that the stunting prevalence in Mpumalanga has increased in comparison with the provincial SADHS results, but have decreased compared to the provincial SANHANES results. With a current prevalence of 28.5 % in children of the same age group, the current prevalence of stunting in Mpumalanga is, however, in line with the national prevalence of stunting reported by both the SANHANES and the SADHS. This indicates that there may not be any difference in the number of children experiencing chronic undernutrition in 2021. While the SADHS reported that stunting was more prevalent nationally in the age group 18-23 months, the result of this provincial analysis indicates that stunting is more prevalent in children aged 42-53 months in Mpumalanga. 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; however, there is no significant differences between the genders. At a district level, the current study reported that stunting is more prevalent in the Gert Sibande and Nkangala districts than it is in the Ehlanzeni District.

The national prevalence of wasting was reported to be 3.7% in 2012 (SANHANES), with a lower provincial prevalence in Mpumalanga of 3.1%. 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 Mpumalanga of 6.0%, thereby indicating that almost double the number of children were experiencing acute undernutrition in 2021, with the older age groups experiencing the highest

prevalence. However, there were no differences between the two gender groups across districts in the current study.

The prevalence of underweight in Mpumalanga in the current study (9.4%) is lower than the provincial prevalence of underweight reported by the SANHANES in 2012 (13.3%). However, it is higher than the national prevalence 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 Mpumalanga do, however, have a far higher prevalence of overweight (21.2%) than the national level reported in 2016.

The above trends across time seem to indicate that over the last 10 years, both chronic and acute undernutrition have decreased. This could be a direct impact of the COVID-19 pandemic. At a district level, it appears as if the Gert Sibande district has the highest prevalence of both acute and chronic undernutrition.

Anthropometry (18 years and older)

At a national level, the mean BMI in females was 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 Mpumalanga for females (28.3 kg/m2), while a slightly higher provincial mean BMI was reported for males (24.2 kg/m2 in 2012. The current study however reported a slightly higher mean BMI for both females (30.0 kg/m2) and a similar mean BMI for males (24.1 kg/m2) in Mpumalanga.

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 Mpumalanga was slightly lower than the national estimate for both females (62.0%) and males (30.4%) in 2012. In 2016, the SADHS reported the same provincial prevalence in Mpumalanga for females (62.0%) and a lower prevalence of 24.1% in males). Ten years later, the results of this study reported a higher prevalence of overweight and obesity in both females (70.9%) and males (30.1%) in Mpumalanga compared to the SADHS. The results for males in this study seemed to corroborate the SANHANES data.

The current study also reported an increase in the proportion of both females (46.7%) and males (9.3%) regarding a waist hip ratio larger than 0.85 and 1.0, respectively, compared to previous studies. For females SANHANES reported 47.1% and 49.6% at a national and provincial level, respectively. For males, SANHANES reported 6.8% and 5.3% 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 et al., 2010), as well as other health issues. In the present survey, the mean dietary score of the population was 4.86, with nearly 31.8% of the population having a score less than 4. These results indicate that Mpumalanga has a better dietary diversity profile than the national profile reported in SANHANES in 2012 (mean of 4.2 and 40%) and that of the NFCS in 2009 (mean 4.02 and 38%).

9 Wellbeing and Associated Shocks

9.1 Household Health Status, Chronic Illnesses, and Diseases

The study sought to review the disease burden and health experiences of household heads and members in the year preceding the study. As expected, a wide range of illness/diseases were reported (Table 35). The most common illnesses/ diseases reported by household heads were coughs/colds/chest infections (27.4%), headaches (17.6%), hypertension (10.2%), HIV/AIDS (10.6%) and abdominal pains (9.2%). Cough/ Cold/chest infections were also reported by 20.3% of household members. These are commonly reported ailments some of which are simply symptoms rather than confirmed diseases. Nonetheless, the level of access to food and especially nutritious food predisposes individuals to a multitude of illnesses/ diseases and also influences the ability to prevent/ manage/ recover from these illnesses/diseases. Diseases such as diabetes and hypertension, for example, require specific diets in order to be managed successfully. It is there important that households have access to diverse diets, including medically prescribed diets.

Table 61: Disease experienced by household heads and members a year prior to the survey

	Household heads		Household members	
Disease	**n**	**%**	**n**	**%**
Cough/cold/chest infection	430	27.4	1,317	20.3
Headache	269	17.6	610	9.7
Hypertension	235	10.2	343	5.4
HIV/AIDS	170	10.6	316	4.8
Abdominal pains	160	9.2	280	4.4
Toothache or mouth infection	156	8.6	299	4.6
Eye infection	138	7.6	237	3.5
Diabetes	117	3.9	161	2.4
Fever/malaria	117	9.5	352	5.7
Other disease	106	3.8	245	4.0
Asthma	57	2.1	141	2.1
Skin rash	46	4.6	166	2.7
Paralysis	41	1.4	70	1.1
Diarrhoea	41	1.7	141	2.2
TB	34	1.4	58	0.9
Vomiting	31	2.9	113	1.8
Bronchitis/pneumonia/chest pain	10	0.5	26	0.4

The study found low prevalence of chronic illness (a disease that lasts for more than 3 months) at both the household (13.8%) and household member levels (6.3%) (Figure 91). The significance of this finding is that food and nutrition security is vital to managing most chronic diseases (such as TB and diabetes) 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.

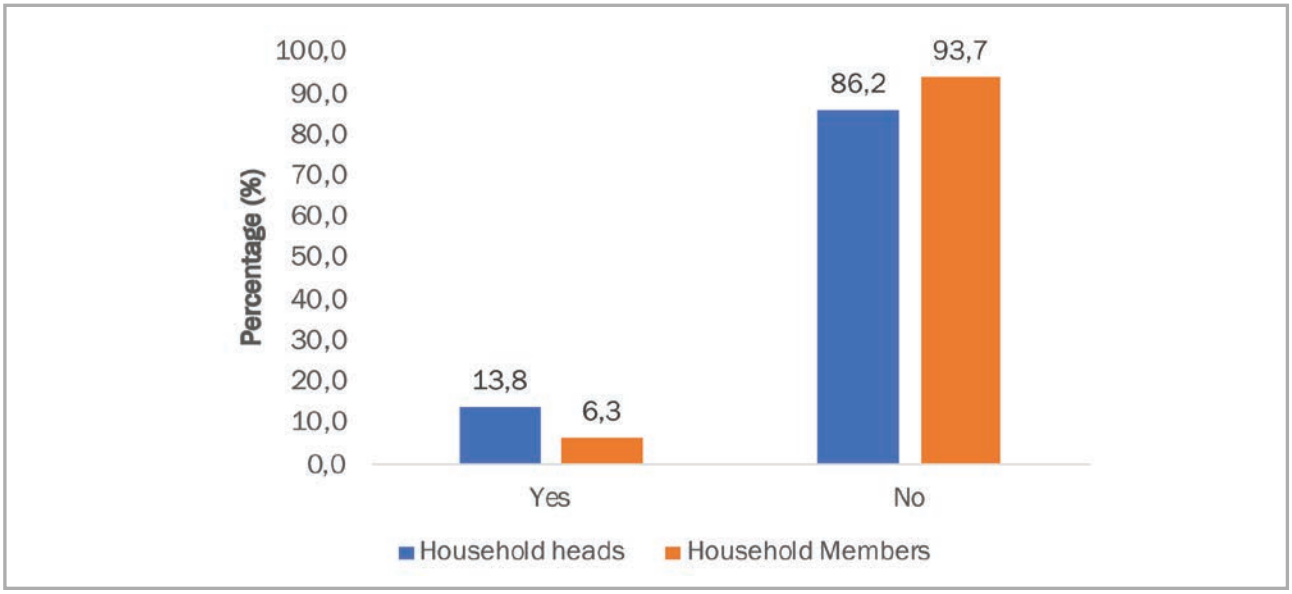


Figure 91: *Household heads and members reported to having been continuously ill, for at least 3 months in the last 12 months prior to the survey*

There was generally no difference in the reported or perceived health status of household heads by sex and district, but noticeable differences are observed particularly by age (Table 62). Those aged 55 years and above reported significant levels of poor or fair health compared to those younger. Gert Sibande had a slightly higher percentage (16.3%) of household heads who perceived their general health status as poor or fair.

Table 62: 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							
Female	16.6	[10.2-25.8]	55.5	[46.4-64.2]	27.9	[20.5-36.7]	639
Male	11.2	[8.0-15.5]	59.1	[49.7-67.8]	29.7	[23.2-37.1]	724
Total	**13.9**	**[10.3-18.5]**	**57.3**	**[52.0-62.5]**	**28.8**	**[23.6-34.7]**	**1,363**
Age group							
18-24	7.0	[2.6-17.2]	61.2	[44.2-75.8]	31.9	[19.0-48.3]	53
25-34	11.8	[5.9-22.0]	54.1	[44.2-63.6]	34.2	[22.3-48.4]	223
35-44	12.5	[7.3-20.6]	59.6	[51.3-67.4]	27.9	[20.9-36.2]	281
45-54	11.9	[7.8-17.8]	66.6	[58.0-74.1]	21.5	[15.3-29.4]	321
55-64	24.6	[15.5-36.7]	48.3	[37.5-59.2]	27.1	[19.7-36.1]	249
65+	38.6	[30.5-47.3]	45.8	[38.4-53.4]	15.6	[9.7-24.1]	235
Total	**13.9**	**[10.3-18.5]**	**57.3**	**[52.0-62.5]**	**28.8**	**[23.6-34.7]**	**1,362**
District							
Ehlanzeni	14.6	[9.7-21.3]	56.2	[46.0-65.9]	29.2	[22.5-36.9]	518
Gert Sibande	16.3	[10.5-24.4]	57.3	[50.5-63.7]	26.4	[18.2-36.8]	420
Nkangala	10.7	[6.0-18.5]	58.2	[47.2-68.4]	31.1	[22.2-41.6]	425
Total	**13.9**	**[10.3-18.5]**	**57.3**	**[52.0-62.5]**	**28.8**	**[23.6-34.7]**	**1,363**

A similar pattern is observed across household members by sex, age, and district (Table 63). Unsurprisingly, the elderly (55-64 years and 65 years and older) had the higher percentage of household members who were reported as having poor or fair health status, with 21.3% and 37.9%, respectively.

Table 63: 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	8.3	[7.0-9.8]	55.2	[50.5-59.9]	36.5	[31.9-41.3]	2,874
Female	9.6	[7.9-11.6]	56.1	[51.5-60.7]	34.3	[29.8-39.2]	3,176
Total	**9.0**	**[7.6-10.6]**	**55.7**	**[51.2-60.1]**	**35.3**	**[30.9-40.0]**	**6,050**
Age group							
0-14	3.4	[2.2-5.1]	55.5	[49.8-61.0]	41.1	[35.6-46.9]	1,966
15-24	4.5	[3.2-6.3]	54.2	[48.0-60.2]	41.4	[35.4-47.6]	1,139
25-34	7.5	[5.6-9.8]	57.9	[52.6-63.0]	34.6	[29.8-39.8]	1,037
35-44	12.1	[9.3-15.6]	57.9	[52.7-63.0]	30.0	[25.2-35.3]	686
45-54	16.6	[12.6-21.6]	57.3	[51.1-63.3]	26.0	[21.0-31.7]	489
55-64	21.3	[16.7-26.7]	55.1	[47.8-62.1]	23.7	[17.8-30.7]	340
65+	37.9	[31.1-45.2]	48.7	[41.8-55.6]	13.5	[9.8-18.2]	280
Total	**9.0**	**[7.6-10.6]**	**55.7**	**[51.2-60.1]**	**35.3**	**[30.9-39.9]**	**5,937**
District							
Ehlanzeni	9.6	[7.5-12.3]	49.8	[43.2-56.3]	40.6	[34.0-47.5]	2,395
Gert Sibande	9.6	[7.5-12.2]	63.1	[56.4-69.3]	27.2	[21.3-34.2]	1,733
Nkangala	7.7	[5.6-10.5]	59.3	[51.4-66.8]	33.0	[25.7-41.3]	1,960
Total	**9.0**	**[7.6-10.6]**	**55.7**	**[51.2-60.1]**	**35.3**	**[30.9-39.9]**	**6,088**

Health Status by Municipality

Figure 92 shows that Dipaleseng local municipality was under the highest category (12.3% to 16.2%) of household members with reported poor or fair health status. Local municipalities that fell under the lowest category (1.0% to 2.4%) were Chief Albert Luthuli and Steve Tshwete.

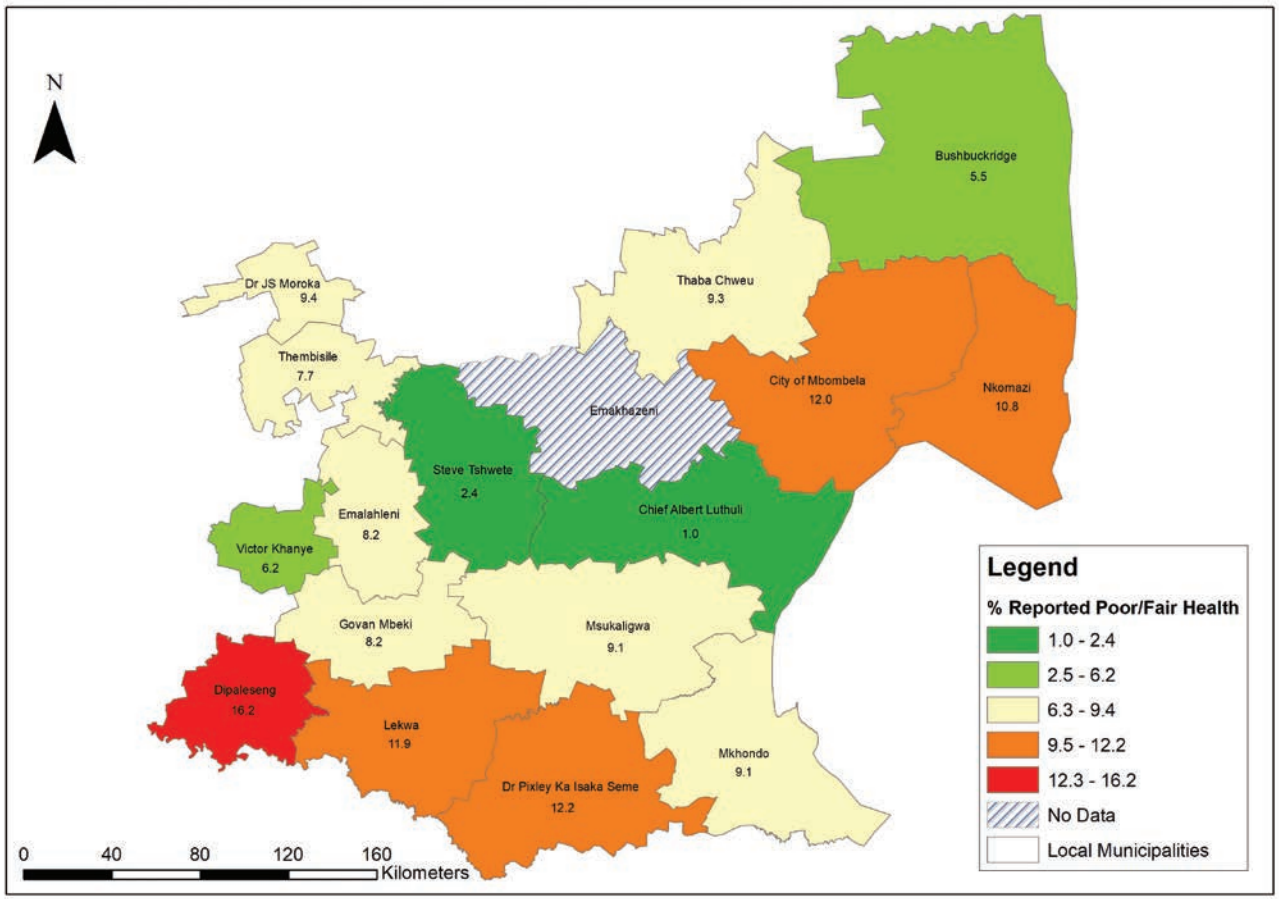


Figure 92: *Household members reported perceived health status by local municipality*

9.2 Shocks, COVID 19 coping Strategies and their Associated effect on Food Availability and Access

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 three districts of Mpumalanga. Only about 5% of the respondents in all the district attest to have experienced flooding. Over 90% across the three districts reported that they have not experienced floods (Figure 93). In general, Mpumalanga normally experiences flooding; however, during the period of study, South Africa was having a neutral year and they did not above normal rainfall.

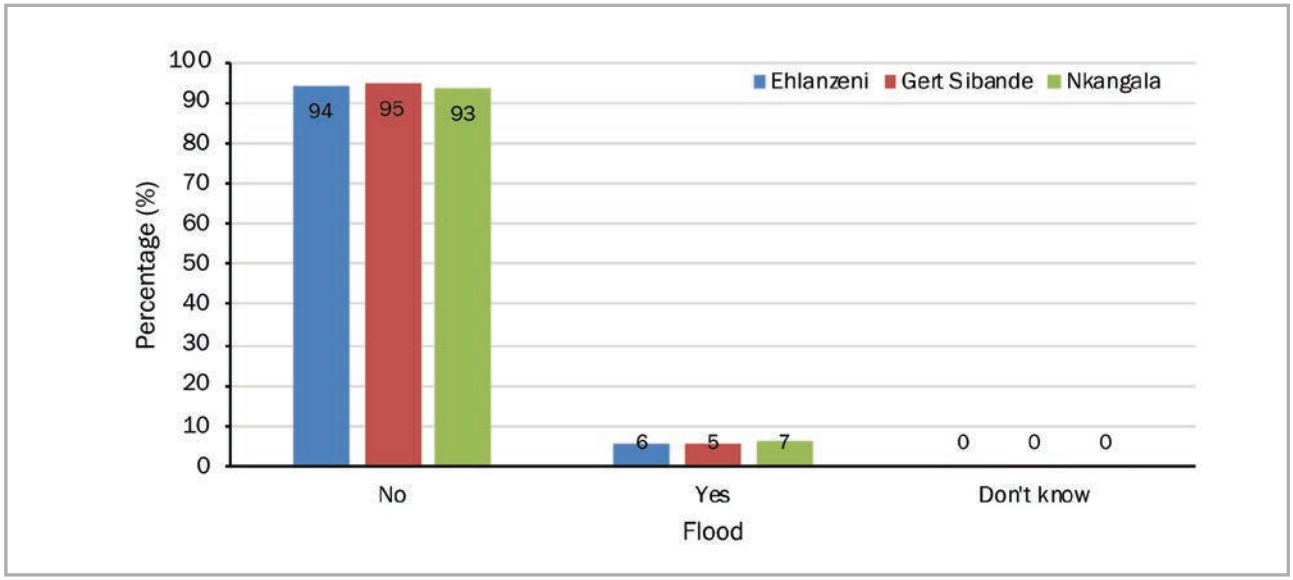


Figure 93: *Household that experience drought and water shortage shock*

Overall, Mpumalanga experiences annual variation when it comes to drought. It experiences years with wet summers, neutral, and dry seasons as shown by the Figure 94 below in which only a handful (less than 10% in all districts) have experienced drought shock during the study period.

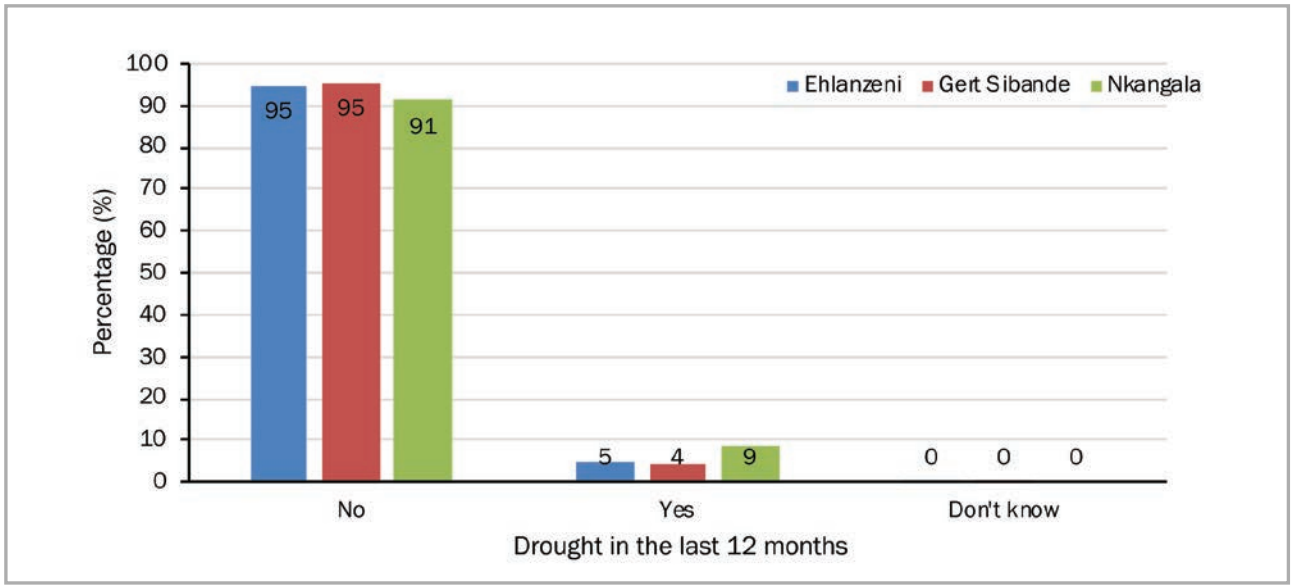


Figure 94: *Household that experience drought shock by district*

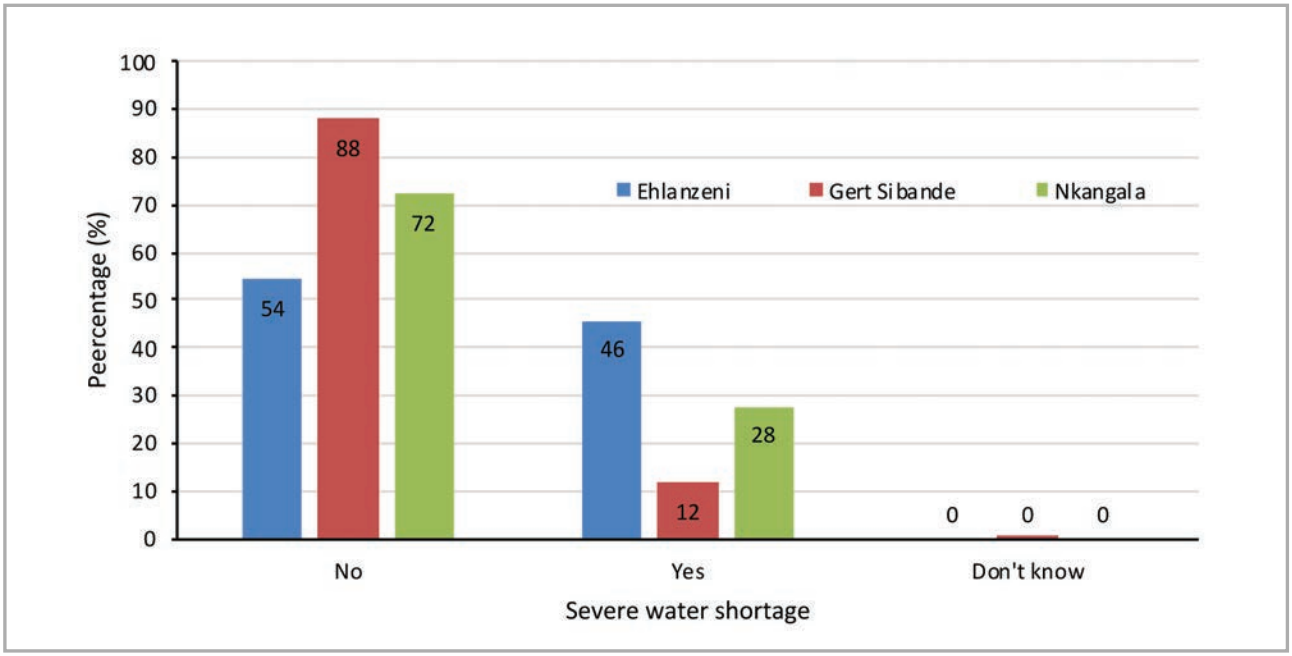


Figure 95: *Household that experience severe water shortage shock by district*

Severe water shortage is one of the shocks that was reported in most of the districts and was more pronounced in Ehlanzani District (41%) as depicted by the graph. However, severe water shortage was least reported in Gert Sibande (12%) (Figure 95).

9.2.2 Crop disease and crop failure

Crop failure and emergence of crop diseases were not widely reported across the districts, with Nkangala having about 30% whilst the least was reported in Gert Sibande District (12%) (Figure 96).

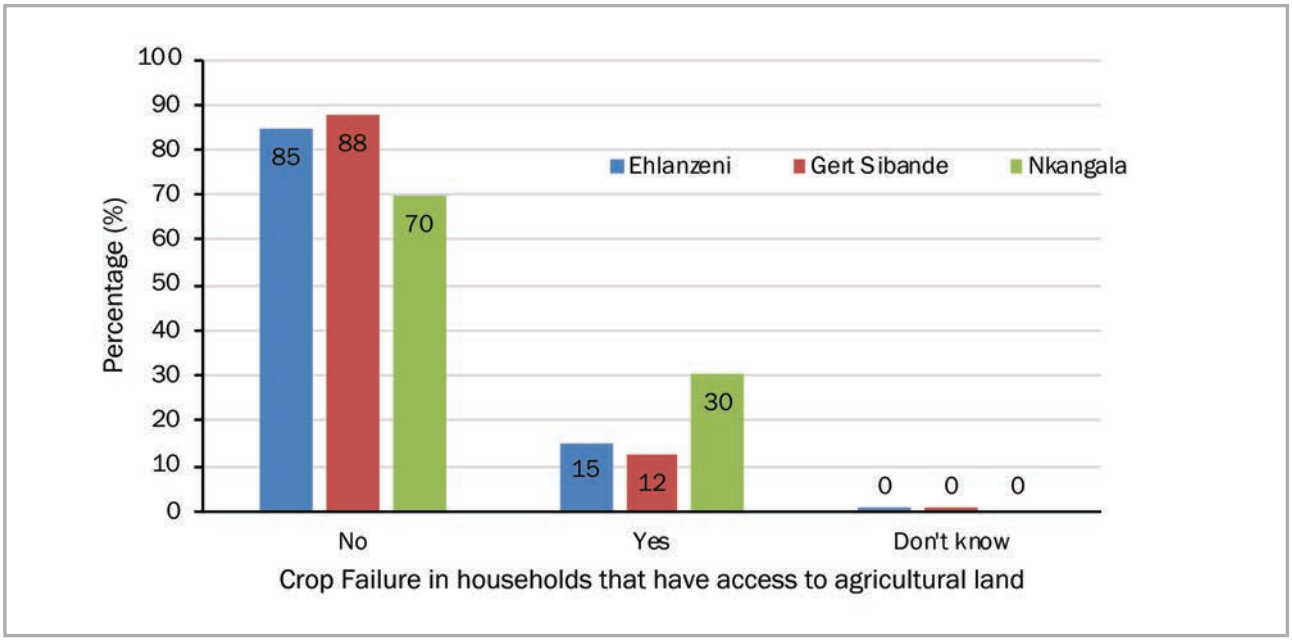


Figure 96: *Household that experience crop failure shock by district*

Mpumalanga received above average rainfalls during the sampled period and because of the high rainfalls received, they experienced extremely limited crop failure in all the districts. Nkangala experienced the greatest crop diseases during the sampling period (32%). On average, all the districts have little involvement in agricultural production activities, hence the smaller number of crop failure and disease. They are less involved in agricultural activities since there is a high employment rate due to industries, mining, and energy utilities in the province.

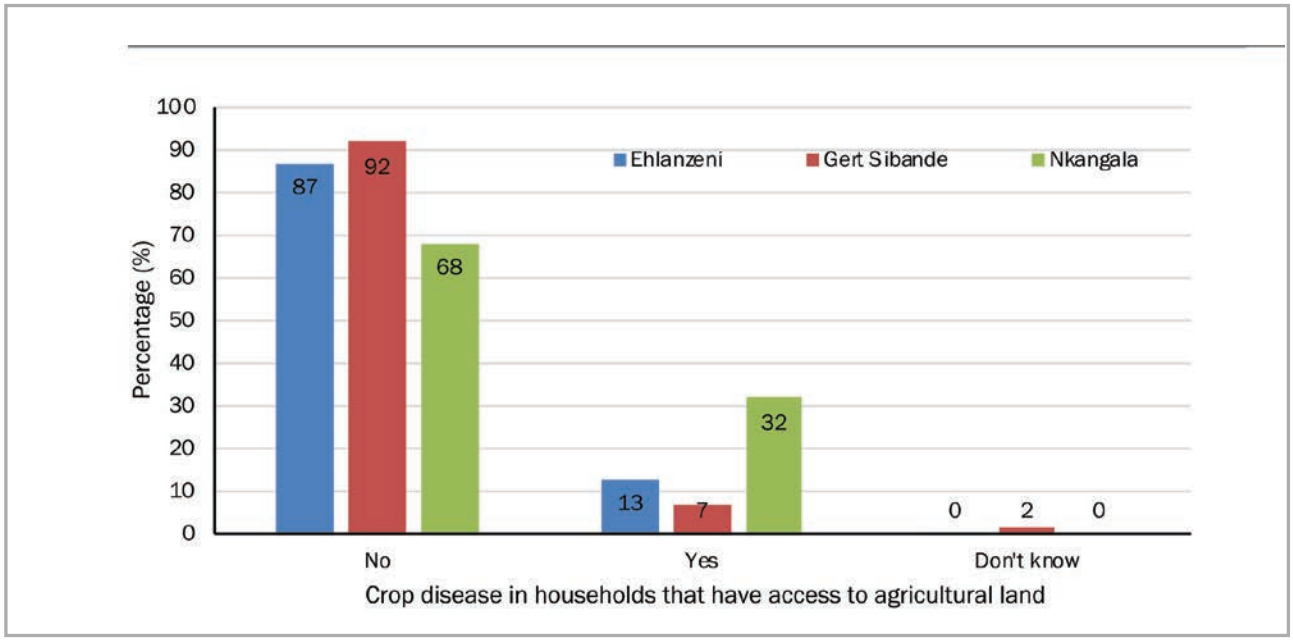


Figure 97: *Household that experience drought and water shortage shock by district*

9.2.3 Increase in inputs and food prices

The increase in food prices was the biggest shock experienced across all the three districts in Mpumalanga province. Ehlanzeni district reported the highest percentage (76%) in terms increases of food prices. This is attributable to the idea that there was extremely limited food production globally, and shocks such as the COVID-19 pandemic would immediately trigger prices increases since the supply chains were disrupted.

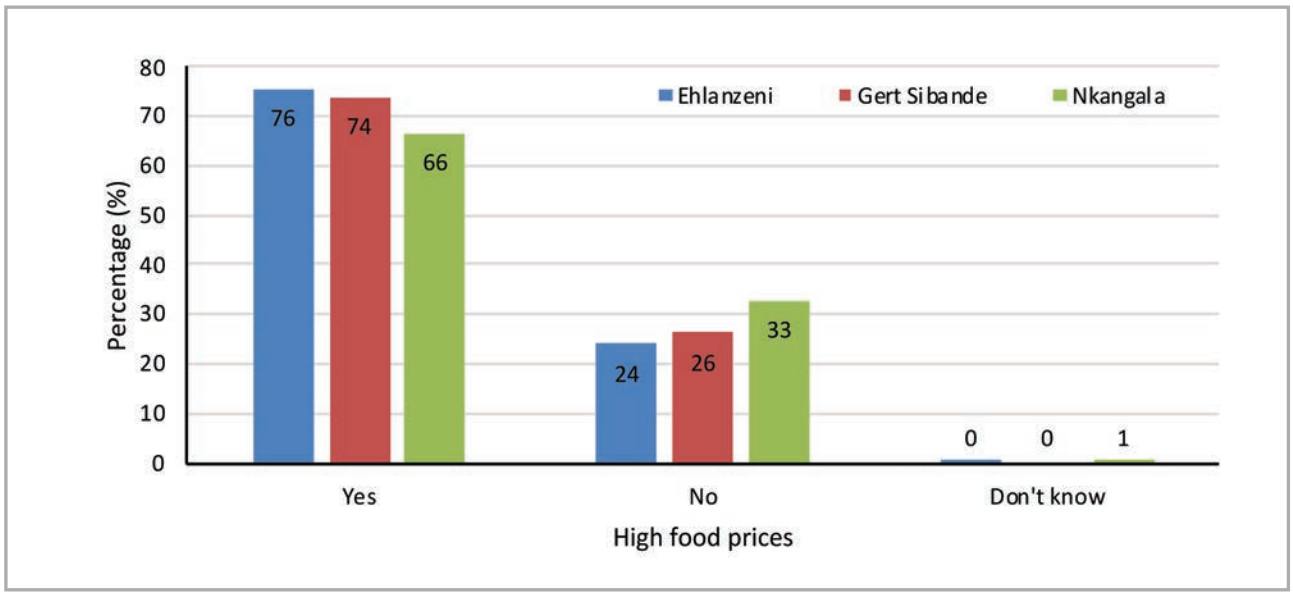


Figure 98: *Households that experienced high food prices shock disaggregated by district*

The increase in input prices was also reported in Nkangala District (45%) and Ehlazeni District (24%) whilst it was least in Gert Sibande District (19%). 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 three districts (Figure 99).

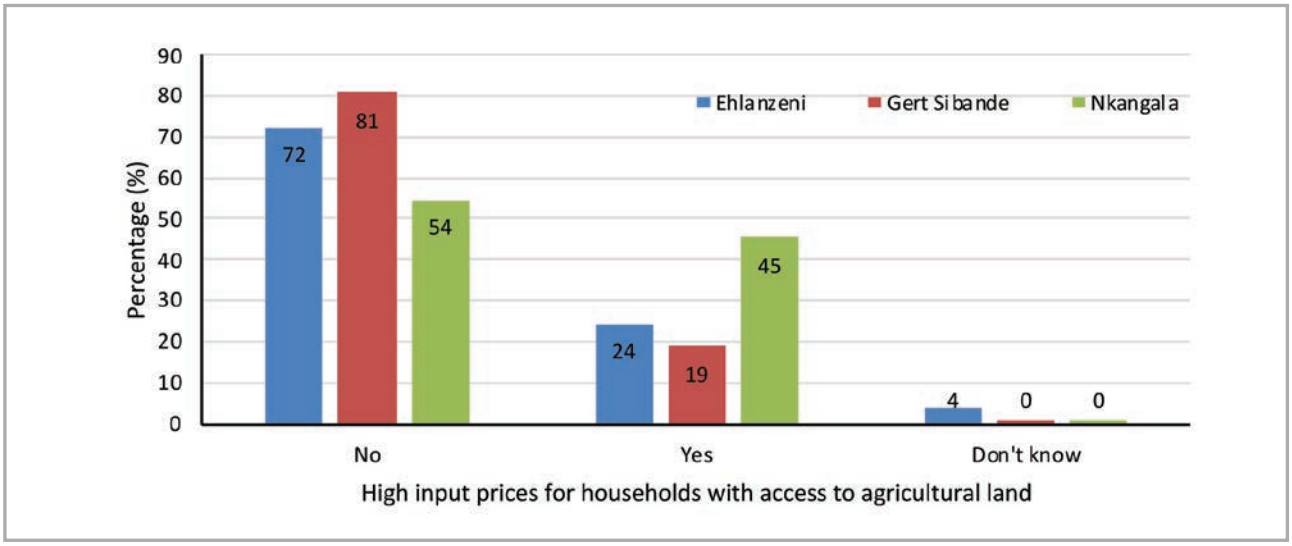


Figure 99: *Households that experienced high input prices shock disaggregated by district*

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 at most 27% of the respondents in all the districts of Mpumalanga were never worried about their food running out because of the impacts of COVID-19 (Table 64).

Table 64: Households that worried their food would run out before we got money to buy more

We worried our food would run out before we got money to buy more	Ehlanzeni		Gert Sibande		Nkangala	
	%	N	%	N	%	N
Never	26.7	150	22.0	93	23.3	94
Often	16.0	126	19.2	96	28.6	127
Rarely	25.5	117	17.5	70	11.4	56
Sometimes	31.8	219	41.3	206	36.7	220

About 41% of the households in Greater Gert Sibande 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 Nkangala District where about 37% of the households sometimes worried that their food would run out. In Nkangala as well, the food that they bought did not often last, and 30% of the respondents did not have money to buy more food (Tables 65 to 67).

Table 65: Households whose food did not last, and they did not have money to get more

The food that we bought just did not last, and we did not have money to get more	Ehlanzeni		Gert Sibande		Nkangala	
	%	N	%	N	%	N
Never	28.6	170	23.2	94	23.3	98
Often	15.0	114	20.4	94	30.0	130
Rarely	26.8	129	20.1	77	12.8	64
Sometimes	29.6	199	36.4	201	33.9	207

Table 66: Households who could not afford sufficient and nutritious food because the price of food increased

We couldn't afford sufficient and nutritious food because the price of food increased	Ehlanzeni		Gert Sibande		Nkangala	
	%	N	%	N	%	N
Never	24.2	152	20.5	97	24.0	100
Often	15.0	116	14.8	85	28.8	132
Rarely	30.0	129	20.8	75	14.3	62
Sometimes	30.8	214	43.8	209	33.0	206

In Ehlanzeni and Nkangala, about 24% of the households reported that they could not afford sufficient and nutritious food because of the price increases. Similar trend was reported in Gert Sibande where only 20% of the households could not have sufficient and nutritious food. Across all the three 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 67 below where 27% of the respondents in Ehlanzeni District reported that they were unable to eat healthy and nutritious food (Table 67).

Table 67: Households which were unable to eat healthy and nutritious food

You were unable to eat healthy and nutritious food	Ehlanzeni		Gert Sibande		Nkangala	
	%	N	%	N	%	N
Never	27.6	150	20.2	96	25.3	108
Often	14.8	114	15.0	83	25.3	128
Rarely	27.2	132	24.2	87	13.7	63
Sometimes	30.4	216	40.6	201	35.8	202

Table 68: Households which could not access the cheap and affordable food market, because they were shut down due national lockdown restrictions

We couldn't access the cheap and affordable food market, because they were shut down due national lockdown restrictions	Ehlanzeni		Gert Sibande		Nkangala	
	N	%	N	%	N	%
Never	175	24.0	120	25.4	93	23.6
Rarely	179	35.0	102	24.9	85	15.6
Sometimes	188	30.1	163	31.4	202	34.9
Often	68	10.9	81	18.3	118	26.0

Most households across the districts reported that sometimes they could not access cheap and affordable food markets since they were shut down because of COVID-19 national lockdown restrictions. However, this was mostly experienced in Gert Sibande (Table 68).

Table 69: Household heads who were hungry but did not eat

Household heads were hungry but did not eat	Ehlanzeni		Gert Sibande		Nkangala	
	%	N	%	N	%	N
Often	7.7	50	6.4	39	14.1	58
Rarely	23.7	140	18.3	82	16.5	72
Sometimes	16.7	130	17.7	107	23.9	131

Table 70: Household head who had to skip a meal

Household head had to skip a meal	Ehlanzeni		Gert Sibande		Nkangala	
	%	N	%	N	%	N
Never	54.8	273	50.6	197	50.4	243
Often	8.9	66	8.8	47	17.4	73
Rarely	16.3	122	16.3	84	13.4	66
Sometimes	20.0	149	24.3	136	18.8	119

Although skipping a meal was least reported across all the districts of Mpumalanga, in Nkangala it was often high (17.4%) compared to other districts. In Gert Sibande household heads had to sometimes skip meals (24%) (Table 71). This is also attributable to the fact that these are not major food crop producing districts since they mostly rely on formal employment in the commercial agricultural sector, mining, energy, and conservation. Hence households would rely entirely on buying food which was limited due to restricted markets and high food price.

Table 71: Households who ran out of food

Your household ran out of food	Ehlanzeni		Gert Sibande		Nkangala	
	%	N	%	N	%	N
Never	43.7	279	42.8	196	40.6	197
Often	7.3	53	11.3	56	17.7	84
Rarely	27.1	129	21.6	86	14.0	73
Sometimes	21.9	145	24.4	125	27.7	146

COVID-19 was expected to increase the number of households who are food insecure in developing countries. In Mpumalanga, all the districts did report that they often run out of food, with almost 18% of Nkangala. A similar pattern was observed in Gert Sibande, with 11% of the households running out of food.

Table 72: Household heads who went without eating for a whole day

Household heads went without eating for a whole day	Ehlanzeni		Gert Sibande		Nkangala	
	%	N	%	N	%	N
Never	67.8	366	63.3	281	56.2	271
Often	4.6	35	6.1	34	12.1	54
Rarely	14.5	105	14.9	58	10.6	60
Sometimes	13.0	94	15.7	87	21.0	106

Results show that it was very rare for the household heads to go without eating for the whole day. About 12% of the households in Waterberg often went the whole day without eating during the COVID-19 pandemic (Table 72). About 21% of the household heads in Nkangala sometimes went the whole day without eating any food. High food prices were the major shock that most households in Mpumalanga 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 movements, and limited movements especially by seasonal farmworkers. This meant that there was limited transportation of food from one area to another which resulted in food shortages as well as increases in food prices, particularly of nutritious foods. 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 also eased to a lesser extent through 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.

10 Conclusion

Food security is one of the strategic imperatives for South Africa as outlined in many government 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 Mpumalanga 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.

This survey has revealed that socio-economic challenges that include limited food production at household level, high dependencies on social grants, acute unemployment among youth, and dwindling household incomes expose households to food and nutrition insecurity. Subsistence farming in rural areas of Mpumalanga Province has been plagued by climate change and further exacerbated by the COVID-19 pandemic which had accumulated effects on food and nutrition security.

Agriculture production systems

There was limited access to agricultural land in Mpumalanga Province with a paltry 31%, 25%, and 13% households having access to land in Ehlanzeni, Gert Sibande, and Nkangala districts respectively. Of the paltry 31% households that had access to arable land in Ehlanzeni District, 56% were females while 44% were males. Similarly, in Gert Sibande District, of the 25% households that reported having access to land, 71% were females (see Fig 15) while only 29% males reported accessibility to agricultural land. Most of the households in Mpumalanga Province have access to arable land that is less than 500m2 in size which is primarily for residential purposes. Within the province, at least 30% of the households in those districts use the land for food production and other agricultural products. However, the average land size allocated for agriculture production for the 'very poor' and 'poor' households is very small as reported from HEA focus group discussions, where less than a quarter (0-0.25Ha) of a hectare was widely reported as the largest land size cultivated among the poor households.

Generally, there is very limited agricultural production in Mpumalanga Province. Poultry production is very limited since it is practised by only 20% the majority of households in Mpumalanga Province. Households in Mpumalanga Province reported extrenely low percentages of engagement in grain crop production, with at most 10% of all the three districts reporting participation in cropping. Enhlazane District is the main district in which maize is produced (79.5%), whilst Gert Sibande is the least maize farming district (20.5%). There is no household which plants maize in Nkangala. Households across the three districts reported high levels of access to road and market infrastructure; however, there was poor access (<5%) to agriculture extension services in Mpumalanga Province across the three districts.

Food security status

The overall results showed that close to three quarters of the households (71%) in Mpumalanga experienced food insecurity, with only 29% found to be food secure. Figure 41 shows that 22.2% of the households were severely food insecure, 30.2% of the surveyed households were moderately food insecure, and 18.5% of the households were mildly food insecure. Severe food insecurity was experienced by 21% of the male-headed households, compared to 23% of the female-headed households that fell within the same category. Approximately 26% and 34% of male- headed and female-headed households experienced moderate food insecurity, respectively.

The household hunger scale (HHS) shows that most of the sampled households experienced little to no hunger (71.8%). About 20.6% of the households and 7.7%, respectively, experienced moderate hunger and severe hunger. The HHS suggests that the level of food deprivation is not very severe for most of the households in Mpumalanga. The Gert Sibande District was the most food-secure district with 75% of the households found to have experienced little to no hunger. This was followed by Ehlanzeni District with 72% of the households found to have experienced little to no hunger. In terms of the HHS, the Nkangala District was slightly the least food secure, with 68% of the households experiencing hunger compared to others.

With regards to the Household Dietary Diversity Score (HDDS), 84% of households consumed highly diverse diets (more or equal to 6 food groups) whilst 13% and 3% of the households consumed medium dietary diversity (4-5 food groups) and low diverse diets (less or equal to 3 food groups), respectively. About 79% of the male-headed households consumed the highest dietary diversity, compared to 88% of the female-headed households.

Food Consumption Score (FCS) shows that most households (47%) were consuming adequately (acceptable) diversified diets, and about 30% 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. Results further indicate that 23% of the households consumed poor diets.

Regarding the districts, it was found that more households with poor diets were found in the Nkangala District, followed by households from the Gert Sibande District (Table 40). Households from the Ehlanzeni District also consumed slightly diverse diets compared to the other districts, and the district also had slightly more households who were on the borderline.

With regards to Food Expenditure, on average, the households' food expenditure per person per month in Mpumalanga was R571.10, which is below the food poverty line. The households in Nkangala District spent more on food than the other two districts.

Nutrition status

Breastfeeding

Of those aged 0-11 months (n=87), 80.8% were ever breastfed, while 88.6% were breastfeeding at the time the survey was conducted. In children aged 12-24 months (n=93), 84.0% were ever breastfed, while 51.4% were being breastfed at the time the survey was conducted. Ehlanzeni and Gert Sibande districts reported a similar proportion of children (71.0% and 70.3%, respectively), while Nkangala reported the highest proportion (91.2%) currently being breastfed; however, there were no significant differences between districts.

First drink and solids other than breastmilk

Infant formula (34.7%) and plain water (23.1%) were reported to be the most common first drink other than breastmilk that was introduced to infants under 2 years of age. Children aged 0-11 months were not given juice, tea, or homemade mixtures as their first drink, while 18.3%, 2.1%, and 0.5% of those aged 12-24 months were introduced to these as their first drinks, respectively. The mean age at which first semi-solid or solid foods were introduced was 4.9 months. There were no significant differences between age groups, gender, and districts. Commercial infant cereal was the first semi-solid food given to most children aged 0-24 months (39.9%), followed by homemade infant cereal/porridge (30.1%).

Anthropometric measurements

The severity of malnutrition for children under 5 years is relatively low to medium according to WHO classification scale, with prevalence of underweight, stunting, wasting, and overweight being 9.4%, 29%, 6%, and 21%, respectively.

Stunting

The overall prevalence of stunting for children under the age of 5 years (n=382) was 28.5%, of which 16.2% was severe and 12.3% was moderate stunting (Table 54 and Figure 71). Overall, children in the youngest age group had a higher prevalence of stunting (overall, moderate, and severe) compared to those in the older age groups.

In Mpumalanga Province, results of children under 5 years of age indicated that females had a slightly higher prevalence of stunting (29.7%) compared to males (27.1%).

Wasting

The overall prevalence of wasting for children under the age of 5 years (n=366) was 6.0%, of which 4.0% was severe and 2.0% was moderate wasting. The prevalence of severe wasting was highest in children aged 6-17 months (3.1%), while moderate wasting was highest in children aged 42-53 months (5.6%). Males had a slightly higher prevalence of wasting (6.1%) compared to females (5.8%). Gert Sibande reported the highest overall prevalence of wasting (10.6%), while Nkangala reported the lowest overall prevalence (3.8%).

Underweight

The overall prevalence of underweight for children under the age of 5 years (n=395) was 9.4%, of which 1.8% was severe and 7.6% was moderate underweight. The prevalence of overall underweight and moderate underweight was highest in children aged 30-41 months at 16.2% and 15.6%, respectively, while that of severe underweight was highest in those aged 54-59 months (2.8%). The prevalence of overall underweight in males and females was evenly distributed at 9.2% and 9.7%, respectively.

Overweight

The overall prevalence of overweight for children under the age of 5 years (n=366) was 21.2%, of which 13.2% was severe and 8.0% was moderate overweight. Females had a higher prevalence of overweight (24.6%) compared to males (18.3%). While these differences were not significant, it does appear that females had a higher prevalence of severe overweight (17.5% vs 9.7%).

Body Mass Index (BMI)

The mean BMI for adults aged 18 years and older (n=1296) in Mpumalanga was 28.0 kg/m2. This was significantly different between males (24.1 kg/m2; 95%CI 23.0-25.1) and females (30.0 kg/m2; 95% CI 28.8-31.1). Overall, more than 50% were classified as either overweight (25.7%) or obese (31.7%). Less than 40% (37.5%) were classified normal weight and 5.1% were classified as underweight. Disaggregating by gender, (Males n=426. Females n=869), the proportion of both overweight (17.6% vs 29.7%) and obesity (12.5% vs 41.2%) is higher in females than in males, respectively. While 10% more females are overweight, nearly 30% more females are obese compared to males. Conversely, the prevalence of underweight in females (3.8%) is about half of that in males (7.7%).

Waist Hip Ratio

A waist hip ratio (WHR) ≥ 1 in males and ≥ 0.85 in females is indicative of increased risk of non-communicable diseases (NCDs) such as diabetes and hypertension, amongst other illnesses. The mean waist hip ratio for males (n=431) and females (n=889) was 0.88 (range: 0.79-0.95) and 0.85 (range: 0.81-0.95), respectively. Overall, a far greater proportion of females (46.7%) had a high WHR, compared to only 9.3% of males. There were no significant differences in the mean WHR and the proportion of those who had a high WHR among both males and females across the various districts in Mpumalanga. Those in Gert Sibande had the lowest prevalence (44.4%), compared to females in Nkangala (50.8%) who had the highest prevalence.

Individual Dietary Diversity Score

The mean dietary diversity score (DDS) for individuals residing in Mpumalanga (n=429) was 4.86, which is indicative of an adequate dietary diversity. District comparisons showed that Ehlanzeni had the highest mean DDS (5.09) compared Gert Sibande which had the lowest (4.61). About 68.2% of people in Mpumalanga reported an adequate DDS, while 31.8% have a low DDS. Ehlanzeni reported the lowest proportion of people with low DDS (22.5%), while Gert Sibande reported the highest proportion of people with a low DDS (40.6%).

Health Status

Most household heads reported having experienced coughs/colds/chest infections at 27.4%, followed by headaches (17.6%), hypertension (10.2%), HIV/AIDS (10.6%), and abdominal pains (9.2%), in that order. Cough/ Cold/chest infections accounted for 20.3% of household members. The study found low prevalence of chronic illness (a disease that lasts for more than 3 months) at both the household (13.8%) and household member levels (6.3%).

Those aged 55 years and above reported significant levels of poor or fair health compared to those younger. Gert Sibande District had a slightly higher percentage (16.3%) of household heads who perceived their general health status as poor or fair.

Shocks

Severe water shortage is one of the shocks that was reported in most of the districts and was more pronounced in Ehlanzani District (41%) as depicted by the graph. However, severe water shortage was least reported in Gert Sibande (12%). On average, all the districts have littleinvolvement in agricultural production activities, hence the smaller number of crop failure and disease. They are less involved in agricultural activities since there is a high employment rate in the province due to industries, mining, and energy utilities. Crop failure and emergence of crop diseases were not widely reported across the districts, with Nkangala having about 30% whilst the least was reported in Gert Sibande District (12%). The increase in food prices was the biggest shock experienced across all the three districts in Mpumalanga Province. Ehlanzeni District reported the highest percentage (76%) in terms increases in food prices.

COVID-19 impact

Results indicate that at most 25% of the respondents in all the districts of Mpumalanga were never worried about their food running out because of the impacts of COVID-19. In Ehlanzeni and Nkangala, about 24% of the households reported that they could not afford sufficient and nutritious food because of the price increases. A similar trend was reported in Gert Sibande where in only 20% of the households could not have sufficient and nutritious food. Across all the three districts, the respondents reported that they sometimes could not afford sufficient and nutritious foods owing to the increases in the price of food. In Mpumalanga, all the districts did report that households often run out of food, with almost 18% of households in Nkangala District reported to have often run out of food. A similar pattern was observed in Gert Sibande with 11% of the households running out of food. The situation was also eased to a lesser extent through 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.

11 Recommendations

- Focus group discussions generally revealed lack of young people's participation in agricultural activities.
- To revitalize rural economies, government and other stakeholders need to pay attention towards attracting the youth in the agriculture sector, particularly rural youth so that traditional land plots can be used for agricultural purposes. A sizeable number of households were involved in agricultural activities, to increase production.
- Water shortage and recurrent drought emerged as part of major shocks. This implies that there is need for a well-thought-out water provision programme in Mpumalanga Province for household use and for agriculture production purposes. Possible interventions could be construction of dams for irrigation and domestic water reticulation systems 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.
- 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 as 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 on 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, 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 supporting women together with their families to produce their own food to ensure food security at household level. In Mpumalanga, most families rely on food purchased from supermarkets, and formal and informal traders. This is unsustainable and makes households more vulnerable to food insecurity.

- There is also a need to develop and support livestock markets since it also emerged that households rely on livestock sales for income to purchase food.
- Focused investment and the establishment of food banks: Creating an enabling environment for commercial food production - There is need to increase agricultural production in each district through focused food production and agro-processing investments. 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 can be sold at affordable prices.
- 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 of land. People seem to prefer obtaining big pieces of land and use it to build houses rather than for food production. This will increase and sustain agricultural production in rural areas of South Africa. It has potential to allow agriculture to serve as a significant source of income for households.
- Investment in post-harvest agro-processing: Although results showed that there is limited participation in agricultural activities now, 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 avoid 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 in 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 here being made. This will improve the quality of food items traded and increase the profits of informal traders.

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FOOD AND NUTRITION SECURITY

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