2017-2019

Zimbabwe Vulnerability Assessment Committee (ZimVAC) Interplay of Household Resilience and Food and Nutrition Security in Rural Zimbabwe Empirical Evidence from ZimVAC Trend Analysis

Food & Nutrition Council

VAC
ZIMBABWE
Vulnerability
Assessment Committee

RVAA
Regional Vulnerability Assessment
& Analysis Programme
Informing resilient livelihoods

FOREWORD

Zimbabwe has experienced a number of unprecedented economic and environmental shocks and stresses, many of which will have long-lasting impacts. Severe drought episodes have been experienced in 1991–1992, 1994–1995, 2002–2003, 2015–2016, and 2018–2019. Food insecurity, malnutrition, and climate variability (drought and dry spells) are serious challenges in Zimbabwe, particularly in rural areas, and will continue to be challenging due to the effects of climate change. The concept of resilience has emerged as a plausible framework among humanitarian and development actors and governments as a longer-term and more cost-effective strategy for substantially improving regional or local capacity to withstand shocks and stresses, ultimately leading to a reduced need for humanitarian response. Building the resilience of vulnerable populations so they can respond positively to potential shocks requires helping people cope with current change, adapt their livelihoods, and improve governance systems and ecosystem health so they are better able to avoid problems in the future.

Faced by the plethora of shocks, there is a need to build resilience for both rural and urban populations. More so, there is need to design interventions to improve the absorptive, adaptive and transformative capacities that underlie resilience capacity of households. In order to design and implement appropriate interventions, it is important to fully understand the constantly changing relationship between risk and vulnerability on the one hand and livelihood outcomes and resilience on the other. In addition, to measure improvements in resilience in Zimbabwe, empirical evidence is needed on what factors contribute to resilience, under what contexts, and for what types of shocks. It is for this reason that this study was commissioned to generate this evidence through a trend analysis of available data. Data generated from the 2017 to 2019 Zimbabwe Vulnerability Assessment Committee (ZimVAC) Rural Livelihoods Assessment Surveys was used in this study to analyse the relationship between risk and vulnerability and also the relationship between livelihood outcomes and resilience. These livelihood assessment surveys are part of a comprehensive information system that informs Government and its Development Partners on programming necessary for saving lives and strengthening livelihoods in Zimbabwe.

ZimVAC is a consortium of Government, UN agencies, NGO's and other international organisations established in 2002, led and regulated by Government. It is chaired by the Food and Nutrition Council (FNC), a department in the Office of the President and Cabinet whose mandate is to promote a multisectoral response to food insecurity and nutrition

problems to ensure that every Zimbabwean is free from hunger and malnutrition. The information generated is used for policy formulation and programming by Government and its Development Partners.

I want to express my profound gratitude to all our Development Partners in the country and beyond for their support throughout the assessments. Financial support and technical leadership were received from the Government of Zimbabwe and its Development Partners. Without this support, the 2017 to 2019 Rural Resilience Trend Analysis Report would not have been successful. I also want to thank the Food and Nutrition Council (FNC) for providing leadership, coordination and management to the 2017 to 2019 Rural Resilience Trend Analysis Report. Special mention goes to the SADC-RVAA Programme for availing funds and technical support to the 2017 - 2019 Rural Resilience Trend Analysis Report. I hope this report will provide in-depth insights that will provide answers as you search for lasting measures in building resilience of many of our rural households vulnerable to food and nutrition insecurity.

George D. Kembo (DR.)
FNC Director/ ZimVAC Chairperson

ACKNOWLEDGEMENTS

On behalf of the Government of Zimbabwe, SIRDC and FNC wish to express their sincere gratitude and appreciation to the following ZimVAC members for their technical, financial, material support and contributions to the 2017 to 2019 rural livelihoods assessments:

Ministry of Agriculture, Mechanisation and Irrigation Development	**Lutheran Development Services (LDS)**	**Regai Dziveshiri**
Ministry of Finance	Development Aid from People to People (DAPP)	Zimbabwe Community Development Association
Ministry of Health and Child Care	United Nations Development Programme –ZRBF	Germany Agro Action
Ministry of Local Government, Public Works and National Housing	Food and Agriculture Organization (FAO)	International Rescue Committee (IRC) Zimbabwe
Ministry of Primary and Secondary Education	Cluster Agricultural Development Services (CADS)	Community Technology Development Trust Organisation (RUDO)
Ministry of Public Service, Labour and Social Welfare	Sustainable Agriculture Technology	TSURO Trust
Ministry of Rural Development, Promotion and Preservation of National Culture and Heritage	Organisation for Rural Associations for Progress (ORAP)	Higherlife Foundation
Ministry of Transport	GOAL	HOSS
Ministry of Women Affairs, Gender and Community Development	CARE International	FACT Rusape
Office of the President and Cabinet	OXFAM	Rural Utilities Development
SADC RVAC	Enhancing Nutrition and Stepping Up Resilience (ENSURE)	FACT Mutare
Trocaire	Famine Early Warning Systems Network (FEWSNET)	Adventist Development and Relief Agency (ADRA)
World Food Programme (WFP) **UN Women**	Lower Guruve Development Association (LGDA)	SNV
UNFPA	Christian Care	Maternal Child Integrated Programme (MCHIP
UNICEF	Practical Action	World Vision International
United Nations Resident Coordinator's Office (UNRCO)	CARITAS	Save the Children
DFID and USAID	Plan International	Christian Youth Volunteers Association Trust (CYVAT)
Zimbabwe National Statistics Agency (ZIMSTAT)	Red Cross	Mwenezi Development Trust
All Rural District Councils	United States Agency for International Development (USAID)	Wild For Life
		AMALIMA

ACRONYMS

BVIP	Blair Ventilated Improved Pit
CSI	Coping Strategy Index
EAs	Enumeration Areas
ENA	Emergency Nutrition Assessment
FCS	Food Consumption Score
FNC	Food and Nutrition Council
GAM	Global Acute Malnutrition
GBV	Gender Based Violence
GDP	Gross Domestic Product
HDDS	Households Dietary Diversity Score
HHS	Household Hunger Score
IASC	Inter-Agency Standing Committee
LBVA	Livelihoods Based Vulnerability Analysis
MAM	Moderate Acute Malnutrition
MICS	Multi-Indicators Cluster Survey
NAC	National AIDS Council
NGOs	Non-Governmental Organisations
NNS	National Nutrition Survey
PICES	Poverty Income Consumption and Expenditure Survey
RLAs	Rural Livelihoods Assessments
SADC	Southern Africa Development Committee
SAM	Severe Acute Malnutrition
UBVIP	Upgraded Blair Ventilated Improved Pit
UN	United Nations
VAA	Vulnerability Assessment and Analysis
WASH	Water, Sanitation and Hygiene
WHO	World Health Organisation
ZDHS	Zimbabwe Demographic Health Survey
ZimVAC	Zimbabwe Vulnerability Assessment Committee

Table of Contents

List of Tables

List of figures

Executive Summary

Background

Zimbabwe has been faced by several economic challenges which has exacerbated the food and nutrition insecurities in the country. Food and nutrition insecurity has become a reality in most rural and urban households. Economic shocks related to rising inflation eroded buying power of basic food items, forcing a significant number of households to resort to negative coping strategies. The continuing inflationary environment reduced affordability of basic food prices. In addition, poverty continues to be one of the major underlying causes of vulnerability to food and nutrition insecurity. Furthermore, Zimbabwe is among the countries more severely affected, where drought impacts have led to water shortages, declining yields, and periods of food insecurity, accompanied by economic downturns. In particular, the country's agricultural sector, mostly comprised of smallholder rainfed systems, is at great risk of drought. Every district has been affected by drought during the past thirty years, with varying levels of severity and frequency. Severe drought episodes have been observed in 1991–1992, 1994–1995, 2002–2003, 2015–2016, and 2018–2019. These shocks have created poverty traps and increased the prevalence of food insecurity, malnutrition and consumption of unsafe food by reducing real income and forcing the poor to sell their valuable assets, decrease their food consumption, reduce their dietary diversity and increase exposure to food-borne diseases.

Faced with the above challenges, there is a need to build the resilience of vulnerable populations so that they can respond positively to potential shocks. Building resilience requires helping people cope with current change, adapt their livelihoods, and improve governance systems and ecosystem health so they are better able to avoid problems in the future. The concept of resilience has emerged as a plausible framework among humanitarian and development actors and governments as a longer-term and more cost-effective strategy for substantially improving regional or local capacity to withstand shocks and stresses, ultimately leading to a reduced need for humanitarian response. A comprehensive assessment is necessary to fully understand the constantly changing relationship between risk and vulnerability on the one hand and livelihood outcomes and resilience on the other. It is against this background that this study was commissioned to assess the impact of household resilience and food and nutrition security in rural Zimbabwe. The main findings of this study are summarised below.

Main findings

Chapter 3 - Sample Distribution

- The study covers three ZimVAC Rural Livelihoods Assessments (RLAs) from 2017 up to and including 2019.
- The study covers a total of 41,098 rural households.
- The year 2017 constitute 28.8% of the total sampled rural households, while 2018 and 2019 with 14,251 and 15,025 observations, constitute 34.7% and 36.6% of the total sample, respectively.
- Mashonaland East and Mashonaland Central with the respective total samples of 6,187 and 5,477 rural households had the largest contribution to the three-year pooled sample.
- Mashonaland West, Masvingo, and Manicaland provinces had the least contribution to the total pool of rural households in the sample. These provinces had a respective contribution of 4,745, 4,771 and 4,778 observations.

Chapter 4 - Demographic Characteristics of Sample Households

- There was an increase in the proportion of female headed households from 32.7% in 2017 to 50.9%.
- The increasing proportion of female headed households was partly explained by the increase in the proportion of household heads who are married but living apart from their spouse which rose from 7% in 2017 to 7.6% in 2019.
- The average number of household members who were mentally ill increased from 0.142 in 2017 to 0.222 in 2019.
- On the other hand, the average number of household members who were chronically ill increased from 0.105 in 2017 to 0.146 in 2019.

Chapter 5 - Food and Nutrition Security Outcomes

Household Hunger Scale (HHS)

- There was an increase in HHS from 0.203 in 2017 to 0.289 in 2019. The increase is statistically valid with a 99% level of confidence.
- The results indicate that households headed by older people were likely to have 0.27 points reduced HHS.
- At the 1% level of significance, increasing household size by one member increased the likelihood of the household to be in hunger by 0.0136 points.
- Households with chronically ill members were 9.16% more likely to be in hunger as compared to households without chronically ill members, at the 1% level of significance.

- Except for Mashonaland Central and Midlands provinces, households in Mashonaland East, Mashonaland West, Matabeleland North, Matabeleland South and Masvingo provinces had a high propensity for a reduced HHS, at the 1% level of significance.

Food Consumption Score

- Year 2019 had the lowest (43.7%) proportion of households with an acceptable diet and year 2018 (50.5%) had the highest.
- The highest proportion of households with poor (27.7%) and borderline (28.6%) FCS were in 2019.
- Increasing the age of household head by one year increased household propensity to have an acceptable diet.
- Households with a member suffering from chronic or mental illness had a reduced propensity to have an acceptable FCS as compared to households without members suffering from chronic or mental illness.

Household dietary diversity score

- The results show that Year 2019 had the highest HDDS (0.171) and 2017 had the lowest HDDS.
- Households headed by older people were more likely to have a lower dietary diversity as compared to households headed by young people, ceteris paribus.
- At the 1% level of significance, increasing the education level of household head reduced the propensity of a household having higher HDDS.
- Households in Mashonaland Central, Mashonaland West and Matabeleland North Provinces were associated with a high dietary diversity whilst those in Mashonaland East, Matabeleland South and Masvingo provinces were associated with a low dietary diversity as compared to the base province of Manicaland, ceteris paribus.

Chapter 6 - Incidence and Severity of Shocks and Stressors at The Household Level

Economic related stressors

- The results show that cash shortage was the most experienced economic stressor throughout the three years under review and the incidence of this stress increased at an alarming rate from 46.9%s in 2017 to 81.6% in 2019.
- Inferential analysis results revealed that at the 1% level of significance, an increase in the age of household head by one year decreased the propensity for the household to be affected by cereal price change (0.001 points) and by loss of employment (0.002 points).

- Increasing household size by one member increased the propensity of the household to be affected by all the economic stressors except for loss of employment.
- Households with chronically ill members had an increased likelihood to be affected by all the economic stressors as compared to households without chronically ill members, *ceteris paribus*.
- An increase in the age of household head by one year decreased the proportion of households severely affected by the following economic stressors; cereal price change (0.06%), cash shortage (0.06%), loss of employment (0.28%) and household economic stressors (0.1%).

Social related stressors

- There was an increase in the incidence of social conflict from 2.4% in 2017 to 4.2% in 2018 and a decrease from 4.2% in 2018 to 2.2% in 2019.
- Increasing the age of household head by one year was likely to decrease the incidence of social conflict by 0.53%.
- At the 1% level of significance, female headed households were 0.53% more likely to experience social conflict as compared to male headed households.
- At the 5% level of significance, social conflict was higher in households headed by divorced/separated persons.

Incidence of crop and livestock diseases

- There was a significant increase in the incidence of livestock diseases from 9.3% in 2017 to 24.7% in 2019, livestock deaths increased from 8.6% to 23.5%, crop pests increased from 29.9% to 44.1% and household livestock diseases increased from 44.6% in 2017 to 91.8% in 2019.
- At the 1% level of significance, an increase in household size by one member was likely to increase the incidence of crop and livestock diseases.
- At the 1% level of significance, an increase in the age of household head by one year, decreased the severity of crop pests by 0.13% and increased crop and livestock shock by 0.28%.
- At the 1% level of significance, except for Matabeleland South, households in all the other provinces were likely to experience an increase in crop and livestock shock than the base province of Manicaland.

Health related shocks

- The results reveal a significant increase, at the 99% confidence level, in all health-related shocks from 2017 to 2018 and then a significant decrease from 2018 to 2019.
- Households headed by older persons were likely to experience reduced incidences of diarrheal diseases by 0.09%, reduced incidences of malaria disease by 0.01% and likely to experience an increase in health-related shocks by 0.21%.
- Increasing household size by one member increased the propensity for the incidence of HIV/AIDS by 0.2%, diarrheal diseases by 0.14% and health related morbidity by 0.37%.
- The results indicate a significant increase in the severity index for health-related shocks from 0.136 in 2017 to 0.207 in 2018 and a significant decrease to 0.160 in 2019.
- The results also reveal that households with chronically ill members had an increased propensity to experience severe impact due to the death of breadwinner, health related shocks and household morbidity, ceteris paribus.

Climate related shocks

- In 2017, 32.4% of the sampled households experienced drought and the number increased to 76.1% in 2019.
- The results reveal a decrease in climate related shocks from 0.831 in 2017 to 0.801 in 2018 and then an increase to 0.876 points in 2019. The difference was significant at the 99% confidence level.
- There was a decrease in the incidence of floods, waterlogging and hailstorm during the period 2018 to 2019, while the incidence for drought, veld fires and climate related shocks increased during the same period, 2018 and 2019.
- The incidence of drought was likely to increase in all provinces except for Mashonaland West as compared to the base province of Manicaland, *ceteris paribus*.
- There was an increase in the severity of drought at the 99% level of confidence from 68.3% in 2017 to 88.4% in 2019.
- The results indicate an increase in climate related shocks index from 0.498 in 2017 to 0.738.
- The impact/severity of drought increased by 4.17% between 2017 and 2018 and climate related shock index increased by 3.54% during the same period.
- The severity of drought was 1.58% higher in female headed households as compared to male headed households, *ceteris paribus*.

Human and Wildlife Conflict

- There was a significant increase in human-wildlife conflict between 2017 and 2018 and then a decrease between 2018 and 2019.
- The results show that at the 1% level of significance, the incidence of human-wildlife conflict was likely to be 0.2% and 1.34% higher in large size households and households with chronically ill members, respectively.
- More so, the severity of human and wildlife conflict was likely to be 12.3% and 11.2% more in Matabeleland North and Matabeleland South, respectively, as compared to the base province of Manicaland.

Chapter 7 - Resilience

Absorptive capacity

- The results reveal that at the 1% level of significance, absorptive capacity increased by 1.69 points between 2017 and 2018 and decreased by 1.627 points between 2018 and 2019.
- Increasing the age of household head by one year was more likely to increase household absorptive capacity by 0.122 points and by 0.894 for households with chronically ill members.
- Increasing household size by one-member increased household propensity to have a reduced absorptive capacity as compared to small size households.
- Households headed by educated persons were more likely to have a higher absorptive capacity as compared to households headed by less educated persons, ceteris paribus.
- Households in Matabeleland North and Mashonaland West were most likely to have a lower absorptive capacity as compared to the based province of Manicaland.

Adaptive capacity

- The results show an increase in adaptive capacity between 2017 and 2018 and then a decrease between 2018 and 2019.
- Female headed households were more likely to have a reduced adaptive capacity as compared to male headed households.
- At the 1% level of significance, increasing the age of household head by one year and increasing family size by one member increased the likelihood of the household to have an increased adaptive capacity, ceteris paribus.
- At the 1% level of significance, increasing the educational level of household head was likely to increase household adaptive capacity.

- Households in Mashonaland Central, Mashonaland West, Matabeleland North, Matabeleland South, Midlands and Masvingo provinces were likely to have a lower adaptive capacity than those in the base province of Manicaland.

Transformative capacity

- The results reveal a significant decrease in transformative capacity from 23.6 in 2017 to 8.48 in 2018 and then an increase to 14.1 in 2019.
- At the 1% level of significance, increasing the age of household head increased household transformative capacity by 14.9%.
- Large size households and those with chronically or mental ill members had a higher adaptive capacity.

Chapter 8 - Resilience and food nutrition security in the face of livelihoods shocks

Absorptive capacity

- The results show that absorptive capacity reduced the propensity of both drought affected and unaffected households from being in hunger, reduced the probability of both households having an unacceptable dietary diversity and increased the probability of both affected and unaffected households achieving an acceptable FCS.
- The above trends on the impact of absorptive capacity on food and nutrition security in the face of drought were similar for all other shocks investigated in this study such as HIV/AIDS, social conflict, human and wildlife conflict and livestock diseases.
- Overall, the results revealed a positive impact of household absorptive capacities on household food and nutrition security in the face of the following shocks; drought, livestock diseases, social conflict, human and wildlife conflict and HIV/AIDS; absorptive capacities promoted the outcome variables, that is, reduced food and nutrition insecurity.

Adaptive capacity

- Overall, the results reveal a positive impact of household adaptive capacities on food security in the face of the following shocks; drought, livestock diseases, social conflict, human and wildlife conflict and HIV/AIDS, i.e. adaptive capacities reduced food and nutrition insecurity.
- For example, the results reveal that at the 1% level of significance, household adaptive capacity was associated with 0.084 points and 0.07 points decline in the probability of drought affected and unaffected households being in hunger, respectively.

- Drought affected households were associated with 0.119 points decline in the probability of having an unacceptable dietary diversity and those not affected by drought were similarly impacted with a 0.083 points probability decline in the household having an unacceptable dietary diversity.
- More so, adaptive capacity was ceteris paribus associated with an increase in the propensity of both drought affected and unaffected households achieving an acceptable FCS by 0.138 and 0.156 points, respectively.
- The above trends on the impact of adaptive capacity on food and nutrition security in the face of drought shock were similar for all other shocks investigated in this study.

Transformative capacity

- For all shocks considered in this study, the results reveal that at the 1% level of significance, transformative capacity was ceteris paribus associated with a reduced probability of households not affected by shocks achieving an acceptable FCS.
- However, the results show that household transformative capacity did not have an impact on acceptable FCS for households affected by shocks.
- The results reveal that household transformative capacity did not impact on household hunger scale and household dietary diversity as there was no statistically significant difference between shock affected and non-affected households.

Conclusion

Sampled households have managed to build up absorptive and adaptive capacities to cope with exposure to shocks and to recover quickly from the shocks. These absorptive and adaptive capacities could be attributed to resilience building interventions programmes being implemented by the Government of Zimbabwe and Development partners. However, the study reveals that most of the sampled households are yet to build up transformative capacities. This reflects on the need to shift focus within the several resilience building programmes being implemented towards changing the basic configuration of the food systems to create long-term resilience. In other words, there is need to build and improve the transformative capacities.

Recommendations

Based on the above major findings, the following recommendations are put forward.

1. The study revealed that most of the sampled households were yet to build up transformative capacities. There is need to build and improve the transformative capacities.

- For example, in rural areas, an important pathway for building long lasting resilience capacity to food insecurity is through productivity and efficiency[1]. As such, the GoZ and its Development Partners are encouraged to continue promoting efficient production systems, for instance through the adoption of better agronomic practices, diversification, agro-ecological management or sustainable intensification (e.g. the Pfumvudza model).
- Resilience capacity could be developed through asset accumulation and capital formation as a household with more assets is likely to be more resilient to shocks that threaten food security through consumption smoothing (i.e., selling assets to maintain current level of consumption)[2]. The livestock restocking exercise through the provision of heifers and subsidised artificial insemination are good intervention programmes being implemented by the GoZ and its Development Partners that need to be upscaled throughout the country.

2. The study showed that female headed households and those with chronically ill members were more vulnerable to food and nutrition insecurities and it is therefore recommended that resilience intervention programmes target more of such households so as to build and improve their resilience capacities and improve on their food and nutrition security. Targeting marginalised groups such as women is crucial to reducing vulnerability and building resilience. Resilience policy-making, programming and funding instruments should embrace the 'leave no one behind' principle explicitly, prioritising actions to support the poorest and most marginalised with the aim of ending extreme poverty and reducing inequalities.

[1] Keil et al. (2008). What determines farmers' resilience towards ENSO-related drought? An empirical assessment in Central Sulawesi, Indonesia. *Climatic Change, 86*, 291–307
[2] Smith, L. C., & Frankenberger, T. R. (2018). Does resilience capacity reduce the negative impact of shocks on household food security? Evidence from the 2014 floods in northern Bangladesh. *World Development, 102*, 358–376

CHAPTER 1

Background

Rural households in developing countries often face a wide range of recurring and unanticipated environmental, ecological, or socio-economic shocks. Zimbabwe is no exception as the country has been hard hit by several shocks. Recent studies have indicated that climate variability and change are already having an adverse impact on rural communities which mainly depend on smallholder farming. Drought, changing seasons, erratic rainfall patterns, heavy rainfall, and strong winds are among the main climate-related disturbances experienced by local people. Every district has been affected by drought during the past thirty years, with varying levels of severity and frequency. Severe drought episodes have been observed in 1991–1992, 1994–1995, 2002–2003, 2015–2016, and 2018–2019.

The macroeconomic environment remains stressed with negative impacts on poor household livelihoods, incomes, and access to food and other basic needs. The current macro-economic challenges and austerity measures further exacerbated the impact of drought on food and nutrition insecurities in the country. Economic shocks related to rising inflation eroding incomes thereby affecting buying power of basic food items, forcing a significant number of households to resort to negative coping strategies. The continuing inflationary environment reduced affordability of basic food prices. In addition, poverty continues to be one of the major underlying causes of vulnerability to food and nutrition insecurity. The ZIMSTAT Poverty, Income, Consumption and Expenditure Survey 2017 Report[3] revealed that 70.5% of the population were poor whilst 29.3% were deemed extremely poor.

Faced with such challenges and shocks, resilience building is key to protecting communities from food and nutrition insecurities. Resilience is an increasingly common concept throughout a range of research domains, particularly in relation to shocks, economic downturn, climate change, globalisation and environmental disasters[4]. Resilience is defined from a social-ecological perspective as the capacity of socioeconomic systems (e.g., households) to withstand shocks through absorption, adaptation and transformation[5].

[3] http://www.zimstat.co.zw/wp-content/uploads/publications/Income/Finance/PICES-2017-Report.pdf
[4] Skerratt S, 2013, 'Enhancing the analysis of rural community resilience: Evidence from community land ownership', *Journal of Rural Studies* 31, 36–6. https://doi.org/10.1016/j.jrurstud.2013.02.003
[5] Walker, B., Holling, C. S., Carpenter, S., & Kinzig, A. (2004). Resilience, adaptability and transformability in social–ecological systems. *Ecology and Society, 9*.

Resilience has been applied in various contexts to understand whether and how social and economic systems could become more robust to shocks. Building resilience means helping people, communities, countries, and global institutions prevent, anticipate, prepare for, cope with, and recover from shocks and not only bounce back to where they were before the shocks occurred, but become even better-off.

Objective of the study

The main objective of this study was to assess the interplay of household resilience and food and nutrition security in rural Zimbabwe basing on the data generated from 2017, 2018 and 2019 ZimVAC Rural Livelihoods Assessments.

CHAPTER 2

Methodology

This report is based on the data generated from a pool of three Rural Livelihoods Assessments (RLAs) carried out by the Zimbabwe Vulnerability Assessment Committee (ZimVAC) from 2017 up to and including 2019. Multiple methods (i.e., quantitative, qualitative) were used to collect data (both subjective and objective data).

2.1 Conceptual frameworks used

This study was based on secondary data generated from the 2017, 2018 and 2019 ZimVAC Rural and Livelihoods Assessments (RLA) with the understanding of livelihoods within the context of vulnerability and resilience building. The assessment was a cross-sectional study whose design was guided and informed by the Food and Nutrition Security Conceptual Framework and the Conceptual Framework on Food Security Dimensions (Error! Reference source not found.1). The Food and Nutrition Security Conceptual framework illustrates and reinforces the multiple causes of food and nutrition insecurity and the interconnectedness of sectors and indicates the need for multi-sector analysis and response to food and nutrition insecurity within a broader livelihoods and economic framework.

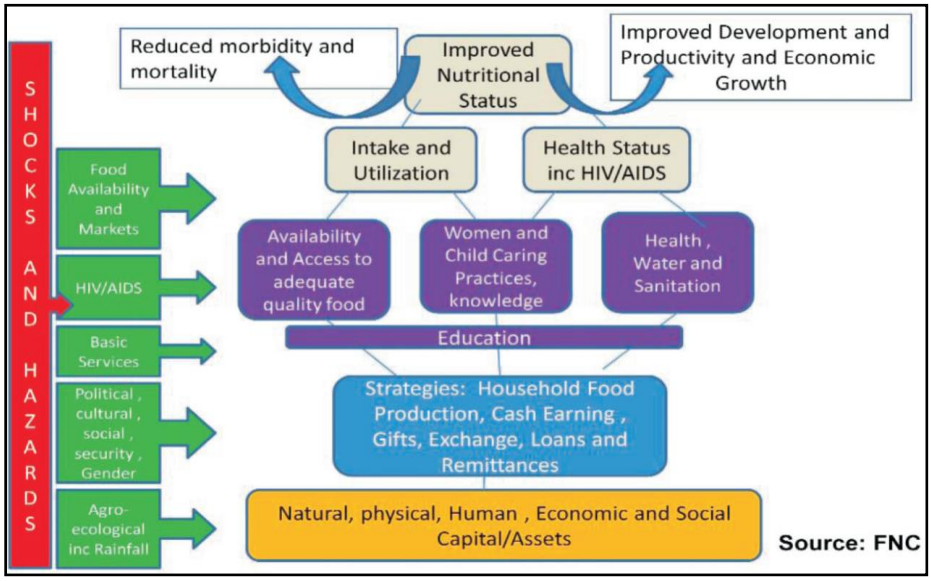


Figure 1. Food and Nutrition Conceptual Framework

The assessments were also guided and informed by the resilience framework (Figure 2) so as to influence the early recovery of households affected by various shocks.

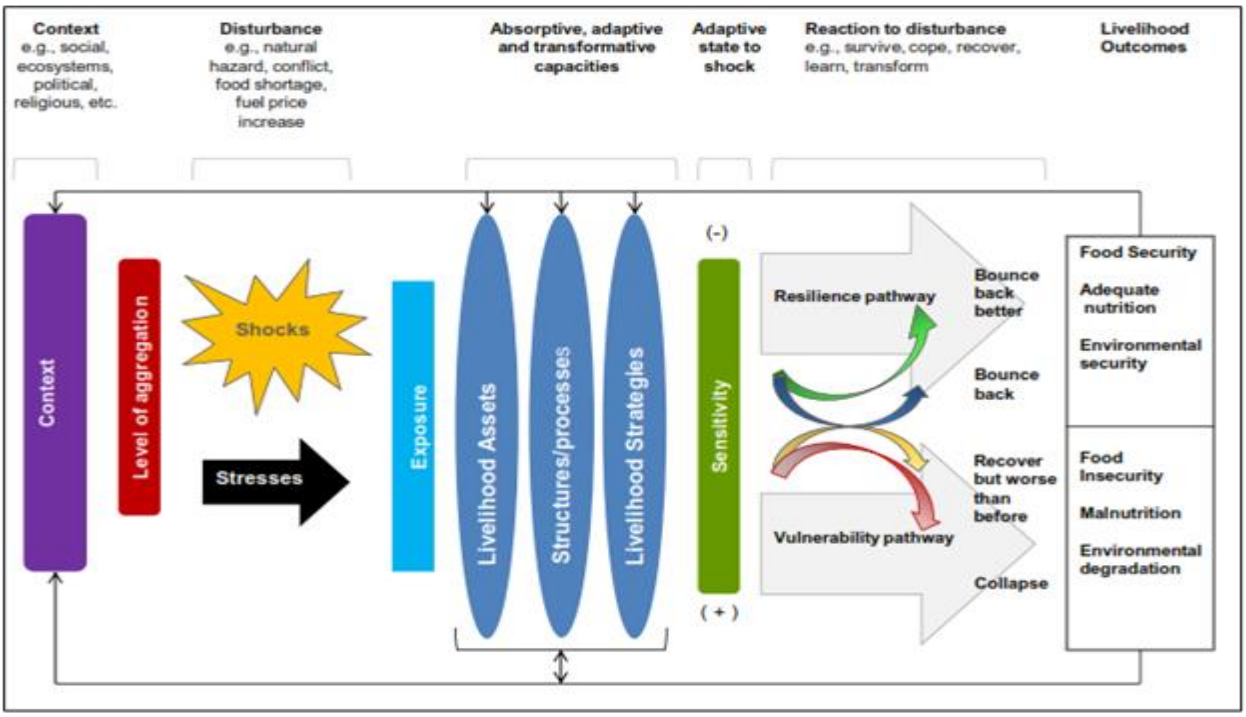


Figure 2. The Resilience Conceptual Framework (Béné et al., 2012)

2.2 Treatment effects

Assessing the treatments effects of various measures of resilience on outcome variables of interest such as food and nutrition security status of the household using the 2017 to 2019 rural livelihoods assessment data is confounded by incomplete information arising from the self-selection of observations into treatment.[6],[7],[8] Propensity Score Matching (PSM) is used to reduce the confounding effects of observational survey data as observational or non-randomized studies suffer from selection bias unlike randomized control trials (RCTs).

We define an indicator variable, T_i, which takes the value of 1 for household i, if the household was treated and 0, otherwise. We also define the outcome variable such as food security of the household as Y_i. The counterfactual problem is that for each household we can only observe either Y_{i0}, or Y_{i1} when T_i = 1 and T_i= 0, respectively.

[6] Austin, P. C. (2011) "An introduction to propensity score methods for reducing the effects of confounding in observational studies", Multivariate Behavioral Research, 46(3), 399–424. https://doi.org/10.1080/00273171.2011.568786

[7] Caliendo, M., & Kopeinig, S. (2008) "Some practical guidance for the implementation of propensity score matching," Journal of Economic Surveys, 22(1), 31–72. https://doi.org/10.1111/j.1467-6419.2007.00527.x

[8] Heckman, J. J., Ichimura, H., & Todd, P. E. (1997) "Matching as an econometric evaluation estimator: Evidence from evaluating a job training programme," Review of Economic Studies, 64(4), 605–654. https://doi.org/10.2307/2971733

Propensity score matching techniques circumvent the counterfactual problem by matching $T_i = 1$ and $T_i = 0$ households using Pr ($T_i = 1 | X$) which is the probability of household i having $T_i = 1$ on the basis of observed covariates, $\mathbf{X_i}$. In this report, we use nearest neighbour matching technique which chooses an individual from the comparison group for treated individual that is closest in terms of propensity score. We estimate the average treatment effect on the treated (ATT) that provides the impact of treatment on outcome variables as follows:

$$ATT = E(Y_{i1} \mid T_i = 1) - E\{E\,(Y_{i0} \mid T_i = 0, \Pr\,(T_i = 1 | X) \mid T_i = 1)\} \qquad [2]$$

The validity of the ATT requires the conditional independence assumption that assignment to $T_i = 1$ or $T_i = 0$ is random after controlling for observed covariates X. [9], [10],[11] To examine treatment heterogeneity in the impact of $T_i = 1$ on the basis of the of a heterogenic factor such as G_i, which could be whether the household was affected by a shock or not, we separately estimate Average Treatment Effects on the Treated (ATT) from Equation 2.

CHAPTER 3

Sample Distribution

3.1 Introduction

To measure improvements in resilience in Zimbabwe, empirical evidence is needed on what factors contribute to resilience, under what contexts, and for what types of shocks. The ability to measure the relationship represented by resilience (i.e., the relationship between shocks, responses, and future states of well-being) depends on the analysis of a number of substantive dimensions and structural features. Substantive features comprise initial- and end-state measures (e.g., well-being outcomes), disturbance measures (e.g., the shocks and stresses that individuals, households, communities and systems are exposed to and the severity and duration of these shocks and stresses), capacity measures (e.g., absorptive, adaptive and transformative capacities in relation to shocks and stresses), and how individuals, households, communities and systems respond to these shocks and stresses. This

[9] Austin, P. C. (2009) "Type I error rates, coverage of confidence intervals, and variance estimation in propensity- score matched analyses", International Journal of Biostatistics, 5(1), 1557–4679. https://doi.org/10.2202/1557-4679.1146

[10] Banerjee, A. V., & Duflo, E. (2011). Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty. New York: Perseus Books.

[11] Huang, J., Oshima, K., & Kim, Y. (2010) "Does food insecurity affect parental characteristics and child behavior? Testing mediation effects." Soc Serv Rev, 84, 381–401. https://doi.org/10.1086/655821

chapter aims to provide the annual distribution of sampled rural households as well as the provincial disaggregation thereof.

3.2 Distribution of the pooled observations by year

Table 1 shows the distribution of the sampled rural households by year of survey. The table shows a total of 41,098 rural households for the three years under consideration. The year 2017 constituted 28.8% of the total sampled rural households, while 2018 and 2019 with 14,251 and 15,025 observations, constituted 34.7% and 36.6% of the total sample, respectively. A pie chart representation of the distribution of the sampled observations is shown in Chapter Highlights

- Study covers three ZimVAC Rural Livelihoods Assessments (RLAs) from 2017 up to and including 2019.
- The study covers a total of 41,098 rural households.
- The year 2017 constitutes 28.8% of the total sampled rural households, while 2018 and 2019 with 14,251 and 15,025 observations, constitute 34.7% and 36.6% of the total sample, respectively.
- Mashonaland East and Central with the respective total samples of 6,187 and 5,477 rural households have the largest contribution to the three-year pooled sample.
- Mashonaland West, Masvingo, and Manicaland provinces have the least contribution to the total pool of rural households in the sample. They have the respective contributions of 4,745, 4,771 and 4,778 observations.

CHAPTER 4

Demographic Characteristics of Sample Households

4.1 Introduction

This Chapter provides the descriptive analysis of the trends in the demographic characteristics of the sampled rural households.

4.2 Trends in the demographic character

Table 3 shows the distribution of the demographic characteristics of the rural households by survey year. The table shows an increase in the proportion of female headed households from 32.7% in 2017 to 50.9%. Furthermore, there was a decline in the average age of the household heads from 50.5 years in 2017 to 46.7 years in 2019. The trends in the proportion of female headed households were partly explained by the proportion of household heads who were married but living apart from their spouse. The proportion of household heads who were married and living apart from their spouse increased from 7% in 2017 to 7.6% in 2019.

Table 3 also shows that the average number of household members who were mentally and chronically ill had been increasing in the period under analysis. Specifically, the average number of household members who were mentally ill increased from 0.142 in 2017 to 0.222 in 2019. On the other hand, the average number of household members who were chronically ill increased from 0.105 in 2017 to 0.146 in 2019. The increase in both variables was statistically valid with a 99% level of confidence.

Table 3. Demographic characteristics of sampled households by year

Variable		Survey Year:						P-value
		2019		2018		2017		
		Mean	S. D	Mean	S. D	Mean	S. D	
Household head is female		0.509	0.500	0.375	0.484	0.327	0.469	0.000
Household head age [Years]		46.660	17.557	49.750	17.234	50.525	16.952	0.000
Marital status of household head:	Married living together	0.650	0.477	0.626	0.484	0.644	0.479	0.196
	Married living apart	0.076	0.265	0.073	0.259	0.070	0.254	0.001
	Divorced/separated	0.057	0.233	0.048	0.213	0.052	0.222	0.000
	Widow/widower	0.180	0.384	0.220	0.414	0.216	0.412	0.000
	Never married	0.037	0.189	0.034	0.182	0.018	0.134	0.000
Education level of household head:	None	0.162	0.369	0.206	0.405	0.218	0.413	0.000
	Primary level	0.403	0.491	0.384	0.486	0.373	0.484	0.242
	ZJC level	0.142	0.349	0.121	0.326	0.126	0.332	0.000
	O' level	0.270	0.444	0.261	0.439	0.257	0.437	0.161
	A' level	0.008	0.089	0.008	0.089	0.009	0.092	0.000
	Diploma/Certificate after primary	0.003	0.056	0.003	0.057	0.005	0.070	0.000
	Diploma/Certificate after secondary	0.007	0.085	0.012	0.108	0.010	0.098	0.000
	Graduate/Post-Graduate	0.004	0.061	0.005	0.073	0.004	0.062	0.023
Household size		4.813	2.180	4.572	2.230	4.996	2.207	0.000
Average household members with:	Mental illness	0.222	0.522	0.144	0.421	0.142	0.555	0.000
	Chronic illness	0.146	0.429	0.117	0.385	0.105	0.488	0.000

Chapter Highlights

- ✓ There was an increase in the proportion of female headed households from 32.7% in 2017 to 50.9%.
- ✓ The increasing proportion of female headed households was partly explained by the increase in the proportion of household heads who are married but living apart from their spouse which rose from 7% in 2017 to 7.6% in 2019.
- ✓ The average number of household members who were mentally ill increased from 0.142 in 2017 to 0.222 in 2019.
- ✓ On the other hand, the average number of household members who were chronically ill increased from 0.105 in 2017 to 0.146 in 2019.

CHAPTER 5

Food and Nutrition Security Outcomes

5.1 Introduction

The term "food security and nutrition" acknowledges the importance of nutrition for achieving food security but maintains the traditional focus on food availability, access, and stability. This perspective emphasizes that food security is a precondition to adequate nutrition. The concept of food and nutrition security has become mainstream in many organizations (e.g., IFPRI, FAO, and UNICEF) and academia. Food and nutrition security underlines the need for greater integration of nutrition and food security in programs, policies, and research and considers appropriate levels of nutrition the ultimate goal of food security. Although food security is essential to ensure adequate nutrition and prevent hunger, the concepts of food security, optimal nutrition and lack of hunger and undernutrition are interlinked but not synonymous.

5.2 Household Hunger scale (HHS)

The Household Hunger Scale (HHS) is a household food deprivation scale and can be used for a variety of objectives, including to: monitor the prevalence of hunger over time across regions, assess the food security situation in a country or region, to provide evidence for the development and implementation of policies and programs that address food insecurity and hunger and to provide information for early warning or nutrition and food security surveillance (FANTA, 2011). The HHS focuses on the food quantity dimension of food access and does not measure dietary quality. It is different from the other household food insecurity indicators as it assesses only the most severe experiences of food insecurity. The HHS is built around 3 questions about perceptions of a household on varying degrees of hunger by the number of times a household has experienced hunger within the past 30 days prior to the survey. The household hunger score ranges from 0 to 6.

5.2.1 Descriptive analysis of the household hunger scale

The results presented in Table 4 show an increase in HHS from 0.203 in 2017 to 0.289 in 2019. The increase was statistically valid with a 99% level of confidence. This increase in the HHS can be attributed to the various shocks and hazards that seemed to be increasing on a yearly basis, e.g. droughts and high inflation. For example, every district has been affected by drought during the past thirty years, with varying levels of severity and frequency. Severe drought episodes have been observed in 1991–1992, 1994–1995, 2002–

2003, 2015–2016, with the south-western provinces of Matabeleland North and South showing particularly high levels[3].

Table 4. Descriptive analysis of the household hunger scale

		Mean	S. D
Survey year:	2017	0.203	0.576
	2018	0.273	0.587
	2019	0.289	0.667
P-value		0.000	

5.2.2 Inferential analysis of the Household Hunger Scale (HHS)

Table 5 shows the results for inferential analysis of Household Hunger Scale (HHS). The results reveal that the year to year increase in HHS was significant at the 1% level of significance. Similarly, the general year trend shows a significant difference at the 1% level of significance. Furthermore, the results indicate that households headed by older people were likely to have a reduced HHS by 0.27 points. In addition, increasing the education level of household head was likely to reduce HHS. The results also show that at the 1% level of significance, increasing household size by one member increased the likelihood of the household to be in hunger by 1.36%. More so, households with chronically ill members were 9.16% more likely to experience hunger as compared to households without chronically ill members, at the 1% level of significance. Except for Mashonaland Central and Midlands provinces, households in Mashonaland East, Mashonaland West, Matabeleland North, Matabeleland South and Masvingo provinces were likely to have a high propensity for a reduced HHS, at the 1% level of significance.

Table 5. OLS and Tobit estimates of year on year and general trends in HHS

VARIABLES	OLS	2-Limit Tobit
	(I)	(II)
Survey year is 2019 [1 if Yes, 0 if No]	0.0801***	0.498***
	(0.00789)	(0.0437)
Survey year is 2018 [1 if Yes, 0 if No]	0.0746***	0.573***
	(0.00726)	(0.0424)
General trend	0.0388***	0.225***
	(0.00396)	(0.0208)
Household head is female [1 if Yes, 0 if No]	-0.00461	0.00511
	(0.00673)	(0.0347)
Household head age [Years]	-0.00270***	-0.0148***
	(0.000225)	(0.00119)
Married living together	0.00715	0.0857
	(0.0199)	(0.108)
Married living apart	-0.0546**	-0.344***
	(0.0214)	(0.124)
Divorced/separated	0.0615***	0.360***

	(0.0238)	(0.124)
Widow/widower	0.0541**	0.339***
	(0.0215)	(0.115)
Primary level	-0.0755***	-0.382***
	(0.00963)	(0.0448)
ZJC	-0.123***	-0.629***
	(0.0120)	(0.0611)
O' level	-0.182***	-0.978***
	(0.0108)	(0.0549)
A' level	-0.245***	-1.699***
	(0.0270)	(0.245)
Diploma/Certificate after primary	-0.251***	-1.875***
	(0.0286)	(0.398)
Diploma/Certificate after secondary	-0.257***	-1.827***
	(0.0214)	(0.245)
Graduate/Post-Graduate	-0.305***	-2.557***
	(0.0195)	(0.419)
Household size	0.0136***	0.0778***
	(0.00154)	(0.00758)
Household members with mental illness	0.0187**	0.0515
	(0.00854)	(0.0368)
Household members with chronic illness	0.0916***	0.402***
	(0.0103)	(0.0392)
Mashonaland Central	-0.0116	0.0459
	(0.0127)	(0.0653)
Mashonaland East	-0.0628***	-0.299***
	(0.0117)	(0.0661)
Mashonaland West	0.0454***	0.290***
	(0.0136)	(0.0656)
Matabeleland North	-0.0495***	-0.249***
	(0.0129)	(0.0705)
Matabeleland South	0.0116	0.142**
	(0.0134)	(0.0669)
Midlands	-0.0278**	-0.122*
	(0.0126)	(0.0667)
Masvingo	-0.0632***	-0.370***
	(0.0126)	(0.0711)
Constant	0.364***	-1.738***
	(0.0254)	(0.136)
Observations	40,296	40,296
R-squared	0.029	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5.3 Food Consumption Score (FCS)

The FCS is a composite score based on dietary diversity, food frequency, and relative nutritional importance of different food groups. It is an important measure of food consumption. The FCS is calculated based on the past 7-day food consumption recall for the household and classified into three categories: poor consumption; borderline; and acceptable consumption. These FCS thresholds are delineated in **Table 6** below.

5.3.1 Descriptive analysis of the Food Consumption Score (FCS)

Table 6 shows that a greater proportion of the sampled households in the three years under review had an acceptable diet. For the period under review, year 2019 had the lowest (43.7%) proportion of households with an acceptable diet and year 2018 (50.5%) had the highest. The highest proportion of households with poor (27.7%) and borderline (28.6%) FCS were in 2019. The high proportion of households with a poor FCS can be attributed to the longer dry spells that lasted 29 days during the 2018/2019 cropping season, resulting in low yields that year.

Table 6. Descriptive analysis of FCS

		2019	2018	2017	P-value
Category of FCS is:	Poor	0.277	0.230	0.235	0.000
	Borderline	0.286	0.265	0.269	0.012
	Acceptable	0.437	0.505	0.495	0.547

Appendix 3 shows a pictorial representation of the food consumption score by year.

5.3.2 Inferential analysis of the trends in FCS for the period under review

Inferential analysis results presented in Table 7 shows that in comparison with the base year of 2017, there is a 4.93% decrease in the probability of a household having an acceptable diet at the 1% level of significance. The general trend over the three years under analysis of 2.60% is also statistically valid at the 1% level of significance after controlling for observed confounders.

The results show that an increase in the age of the household head by one year increased household propensity to have an acceptable diet. The same trend was observed for households headed by educated heads. In addition, the results reveal that at the 1% level of significance, households with a member suffering from chronic illness or from mental illness had a reduced propensity to have an acceptable FCS as compared to households without members suffering from chronic illness or mental illness. At provincial level, the results show that at the 1% level of significance, households in Mashonaland Central and Matabeleland North provinces had a reduced propensity to have an acceptable FCS as compared to the base province of Manicaland.

Table 7. Estimates of year on year and general trends in acceptable FCS

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Survey year is 2019 [1 if Yes, 0 if No]	-0.0493***	-0.127***	-0.205***
	(0.00621)	(0.0162)	(0.0261)
Survey year is 2018 [1 if Yes, 0 if No]	0.0113*	0.0298*	0.0476*
	(0.00620)	(0.0160)	(0.0258)
General trend	-0.0260***	-0.0671***	-0.108***
	(0.00310)	(0.00806)	(0.0130)
Household head is female [1 if Yes, 0 if No]	-0.00681	-0.0168	-0.0277
	(0.00521)	(0.0136)	(0.0219)
Household head age [Years]	0.00297***	0.00768***	0.0124***
	(0.000174)	(0.000456)	(0.000737)
Married living together	-0.00613	-0.0164	-0.0260
	(0.0158)	(0.0408)	(0.0659)
Married living apart	0.0144	0.0366	0.0590
	(0.0177)	(0.0457)	(0.0737)
Divorced/separated	-0.0613***	-0.160***	-0.259***
	(0.0186)	(0.0484)	(0.0782)
Widow/widower	-0.0612***	-0.159***	-0.255***
	(0.0169)	(0.0437)	(0.0707)
Primary level	0.0888***	0.232***	0.374***
	(0.00709)	(0.0187)	(0.0302)
ZJC	0.147***	0.381***	0.614***
	(0.00929)	(0.0242)	(0.0391)
O' level	0.201***	0.518***	0.835***
	(0.00832)	(0.0219)	(0.0355)
A' level	0.298***	0.770***	1.248***
	(0.0276)	(0.0748)	(0.123)
Diploma/Certificate after primary	0.392***	1.082***	1.784***
	(0.0343)	(0.120)	(0.209)
Diploma/Certificate after secondary	0.394***	1.071***	1.755***
	(0.0224)	(0.0741)	(0.127)
Graduate/Post-Graduate	0.456***	1.296***	2.151***
	(0.0292)	(0.116)	(0.208)
Household size	-0.000120	-0.000332	-0.000497
	(0.00116)	(0.00302)	(0.00487)
Household members with mental illness	-0.0247***	-0.0648***	-0.107***
	(0.00568)	(0.0151)	(0.0246)
Household members with chronic illness	-0.0348***	-0.0924***	-0.150***
	(0.00643)	(0.0174)	(0.0282)
Mashonaland Central	-0.0321***	-0.0829***	-0.135***
	(0.00980)	(0.0256)	(0.0413)
Mashonaland East	0.0316***	0.0822***	0.132***
	(0.00955)	(0.0247)	(0.0397)
Mashonaland West	0.00367	0.00988	0.0158
	(0.0101)	(0.0263)	(0.0423)
Matabeleland North	-0.0411***	-0.107***	-0.171***
	(0.0101)	(0.0264)	(0.0426)
Matabeleland South	0.0692***	0.179***	0.289***
	(0.0102)	(0.0264)	(0.0425)
Midlands	0.0530***	0.137***	0.221***
	(0.00984)	(0.0255)	(0.0410)
Masvingo	0.0808***	0.209***	0.336***
	(0.0101)	(0.0263)	(0.0423)
Constant	0.241***	-0.671***	-1.085***
	(0.0200)	(0.0521)	(0.0844)

Observations	40,296	40,296	40,296
R-squared	0.042		

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.4 Household dietary diversity score

Household Dietary Diversity Score (HDDS) is an important nutrition outcome measuring the economic ability of a household to access a variety of foods during a determined period. HDDS is defined as the number of different food groups consumed over a given reference period and Dietary Diversity scores are defined as the number of foods or food groups consumed by an individual (or by any member of the household inside the home (HDDS) over a reference time period. HDDS is an attractive proxy indicator for the following reasons;

i. A more diversified diet is an important outcome in and of itself.
ii. A more diversified diet is associated with a number of improved outcomes in areas such as birth weight, child anthropometric status, and improved hemoglobin concentrations.
iii. A more diversified diet is highly correlated with such factors as caloric and protein adequacy, percentage of protein from animal sources (high quality protein), and household income. Even in very poor households, increased food expenditure resulting from additional income is associated with increased quantity and quality of the diet.

5.4.1 Descriptive analysis of the HDDS

The results presented in Table 8 show an increase in the Household Dietary Diversity Score (HDDS) for the period under review. For example, the results reveal that 2019 had the highest HDDS (0.171) and 2017 had the lowest HDDS. The increase in HDDS was statistically valid with a 99% level of confidence.

Table 8. Descriptive analysis of the HDDS

		Mean
Survey year	2019	0.171
	2018	0.140
	2017	0.105
	P-value	0.000

5.4.2 Inferential analysis of the trends in Household Dietary Diversity Score (HDDS)

Table 9 presents the results of inferential analysis of the trends in HDDS for the period under review. The results show that at the 1% level of significance, *ceteris paribus*,

increasing the years from 2017 increases the probability of a household having a high dietary diversity. The increase in dietary diversity over the three years under review can be attributed to the several nutrition interventions by both the Government and Development Partners. An example of a nutrition intervention programme is the promotion of nutrition gardens. However, at the 1% level of significance, households headed by older persons were likely to have a lower dietary diversity as compared to households headed by young people, all things being constant. This result corroborates with findings by Huluka et al. (2019) and Codjoe et al. (2016) that older household heads face difficulty in diversifying their family diet partly due to loss of energy to work longer hours per day and partly because of lack of alternative sources of income to purchase nutrient-dense foods that can diversify household diets.

Unexpectedly, the results in **Table 9** also show that at the 1% level of significance, increasing the education level of household head reduced the propensity of a household from having a dietary diversity. This result is contrary to other findings in literature[9,10] which show that households with educated heads have high household dietary diversity score. **Table 9** also reveals that at the 1% level of significance, households in Mashonaland Central, Mashonaland West and Matabeleland North provinces were associated with a high dietary diversity whilst those in Mashonaland East, Matabeleland South and Masvingo provinces are associated with a low dietary diversity as compared to the base province of Manicaland, *ceteris paribus*.

Table 9. Estimates of year on year trends in Household Dietary Diversity Score (HDDS)

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Survey year is 2019 [1 if Yes, 0 if No]	0.0635***	0.297***	0.566***
	(0.00427)	(0.0208)	(0.0391)
Survey year is 2018 [1 if Yes, 0 if No]	0.0355***	0.179***	0.344***
	(0.00406)	(0.0212)	(0.0401)
General trend	0.0316***	0.146***	0.277***
	(0.00214)	(0.0102)	(0.0189)
Household head is female [1 if Yes, 0 if No]	0.00736*	0.0443***	0.0764**
	(0.00381)	(0.0168)	(0.0306)
Household head age [Years]	-0.00131***	-0.00602***	-0.0108***
	(0.000124)	(0.000570)	(0.00105)
Married living together	0.0197*	0.0753	0.150
	(0.0106)	(0.0532)	(0.0997)
Married living apart	-0.0202*	-0.147**	-0.269**
	(0.0114)	(0.0611)	(0.116)
Divorced/separated	0.0470***	0.188***	0.350***
	(0.0132)	(0.0610)	(0.113)
Widow/widower	0.0246**	0.101*	0.200*
	(0.0116)	(0.0569)	(0.106)

Primary level	-0.0717***	-0.291***	-0.521***
	(0.00551)	(0.0215)	(0.0381)
ZJC	-0.113***	-0.482***	-0.876***
	(0.00672)	(0.0299)	(0.0548)
O' level	-0.142***	-0.645***	-1.188***
	(0.00607)	(0.0270)	(0.0498)
A' level	-0.169***	-0.845***	-1.590***
	(0.0144)	(0.114)	(0.235)
Diploma/Certificate after primary	-0.176***	-1.141***	-2.262***
	(0.0142)	(0.218)	(0.507)
Diploma/Certificate after secondary	-0.186***	-1.126***	-2.247***
	(0.0101)	(0.134)	(0.309)
Graduate/Post-Graduate	-0.207***	-1.586***	-3.238***
	(0.00959)	(0.266)	(0.705)
Household size	-0.00111	-0.00483	-0.00999
	(0.000814)	(0.00379)	(0.00697)
Household members with mental illness	0.0143***	0.0628***	0.111***
	(0.00428)	(0.0175)	(0.0314)
Household members with chronic illness	0.00926*	0.0378*	0.0721**
	(0.00489)	(0.0200)	(0.0358)
Mashonaland Central	0.0281***	0.122***	0.212***
	(0.00705)	(0.0317)	(0.0582)
Mashonaland East	-0.0231***	-0.117***	-0.230***
	(0.00620)	(0.0325)	(0.0614)
Mashonaland West	0.0473***	0.198***	0.360***
	(0.00739)	(0.0322)	(0.0586)
Matabeleland North	0.0784***	0.314***	0.564***
	(0.00771)	(0.0318)	(0.0575)
Matabeleland South	-0.0472***	-0.245***	-0.472***
	(0.00652)	(0.0355)	(0.0677)
Midlands	-0.00282	-0.0143	-0.0252
	(0.00664)	(0.0325)	(0.0605)
Masvingo	-0.0229***	-0.110***	-0.220***
	(0.00663)	(0.0345)	(0.0652)
Constant	0.228***	-0.731***	-1.219***
	(0.0135)	(0.0652)	(0.120)
Observations	40,296	40,296	40,296
R-squared	0.040		

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Chapter Highlights

Household Hunger Scale (HHS)

- There is an increase in HHS from 0.203 in 2017 to 0.289 in 2019. The increase was statistically valid with a 99% level of confidence.
- The results indicated that households headed by older people were likely to have 0.27 points reduced HHS.
- At the 1% level of significance, increasing household size by one member increased the likelihood of the household to be in hunger by 1.36%.
- Households with chronically ill members were 9.16% more likely to experience hunger as compared to households without chronically ill members, at the 1% level of significance.
- Except for Mashonaland Central and Midlands provinces, households in Mashonaland East, Mashonaland West, Matabeleland North, Matabeleland South and Masvingo provinces had a high propensity for a reduced HHS, at the 1% level of significance.

Food Consumption Score

- Year 2019 had the lowest (43.7%) proportion of households with an acceptable diet and year 2018 (50.5%) had the highest.
- The highest proportion of households with poor (27.7%) and borderline (28.6%) FCS were in 2019.
- On the other hand, an increase in the age of household head by one year increased household propensity to have an acceptable diet.
- Households with a member suffering from chronic or mental illness had a reduced propensity to have an acceptable FCS as compared to households without members suffering from chronic or mental illness.

Household dietary diversity score

- The results show that Year 2019 had the highest HDDS (0.171) and 2017 had the lowest HDDS.
- Households headed by older people were likely to have a lower dietary diversity as compared to households headed by young people, *ceteris paribus*.
- At the 1% level of significance, increasing the education level of household head reduced the propensity of a household having higher HDDS.
- Households in Mashonaland Central, Mashonaland West and Matabeleland North provinces were associated with a high dietary diversity whilst those in Mashonaland East, Matabeleland South and Masvingo provinces were associated with a low dietary diversity as compared to the base province of Manicaland, ceteris paribus.

CHAPTER 6

Incidence and Severity of Shocks and Stressors at the Household Level

6.1 Introduction

A shock is defined as a sudden event that impacts on the vulnerability of a system and its components and a stress is a 'long-term trend that undermines the potential of a given system and increases the vulnerability of actor within it. The impacts of shocks and stresses at the community level depend on the intensity of the hazard, combined with the vulnerability and the capacity of those affected to cope with them.

6.2 Economic related stressors

6.2.1 Descriptive analysis of incidence of economic stressors

Table 10 shows the various economic related stressors experienced by the sampled households. The results show a significant ($p<0.01$) increase in the incidence of economic stressors over the three-year period under review, from 2017 to 2019. The results show that cash shortage was the most experienced economic stressor throughout the three years under review and the incidence of this stress increased at an alarming rate from 46.9%s in 2017 to 81.6% in 2019. This alarming increase in cash shortage as a shock can be attributed to high inflation. A graphical depiction of the trends in economic stressors is given in Appendix 4 of this report.

Table 10. Descriptive analysis of incidence of economic stressors

Stressors	2017		2018		2019		P - Value
	Mean	S. D	Mean	S. D	Mean	S. D	
Cereal price change	0.126	0.332	0.421	0.494	0.789	0.408	0.000
Livestock price change	0.036	0.186	0.215	0.411	0.393	0.488	0.000
Cash shortage	0.469	0.499	0.716	0.451	0.816	0.387	0.000
Loss employment	0.034	0.181	0.057	0.232	0.034	0.180	0.000
Economic shocks index [0 - 4]	0.625	0.730	1.402	1.049	2.023	0.973	0.000

6.2.2 Inferential analysis of trends in the incidence of economic stressors

The observed trends in Table 10 are also confirmed by the inferential analysis results presented in Table 11, which show significant year to year increases in the proportion of

households affected by all economic stressors. Save for loss of employment, the results indicate that the general trends of the incidence of economic stressors had been rising in the period under analysis.

The results reveal that at the 1% level of significance, an increase in the age of household head by one year decreased the propensity for the household to be affected by cereal price change (0.001 points) and by loss of employment (0.002 points). However, the propensity to be affected by livestock theft was increased by 0.025 points. This observed decrease in loss of employment as a shock could be attributed to the high unemployment rate and the shrinking base of employed people in Zimbabwe such that the proportion of sampled household heads that are formally employed was already low. The 2019 ZimSTAT Labour Force and Child Labour Survey estimated the National EPR was at 36%. **Table 11** further reveals that at the 1% level of significance, increasing household size by one member increased the propensity for the households to be affected by all the economic stressors except for loss of employment. More so, households with chronically ill members had an increased likelihood to be affected by all the economic stressors as compared to households without a chronically ill member, *ceteris paribus*. Probit estimates of the year on year trends in economic stressors are shown in **Appendix 5** of this report.

Table 11. OLS estimates of year on year trends in economic stressors

VARIABLES	Cereal price change	Livestock price change	Cash shortage	Loss employment	Economic shocks index [0 - 4]
	(I)	(II)	(III)	(IV)	(V)
Survey year is 2019 [1 if Yes, 0 if No]	0.656***	0.354***	0.346***	-0.00299	1.388***
	(0.00485)	(0.00452)	(0.00584)	(0.00243)	(0.0108)
Survey year is 2018 [1 if Yes, 0 if No]	0.297***	0.180***	0.250***	0.0222***	0.783***
	(0.00525)	(0.00392)	(0.00606)	(0.00265)	(0.0110)
General year trend	0.330***	0.177***	0.169***	-0.00280**	0.691***
	(0.00245)	(0.00235)	(0.00288)	(0.00122)	(0.00546)
Household head is female [1 if Yes, 0 if No]	0.00300	0.0111**	-0.0103**	-0.00155	0.00520
	(0.00454)	(0.00460)	(0.00456)	(0.00215)	(0.0102)
Household head age [Years]	-0.00108***	0.000842***	0.000166	-0.000255***	-0.000263
	(0.000152)	(0.000144)	(0.000159)	(7.02e-05)	(0.000333)
Married living together	0.0505***	0.0245*	0.0358**	0.000230	0.112***
	(0.0144)	(0.0134)	(0.0142)	(0.00694)	(0.0314)
Married living apart	0.00668	-0.0235	0.00286	0.00716	-0.00472
	(0.0162)	(0.0148)	(0.0161)	(0.00777)	(0.0353)
Divorced/separated	0.0379**	-0.0345**	0.00652	0.00594	0.0211
	(0.0169)	(0.0155)	(0.0170)	(0.00812)	(0.0365)
Widow/widower	0.0204	-0.0284**	0.00869	0.0125*	0.0183
	(0.0154)	(0.0143)	(0.0153)	(0.00752)	(0.0337)
Primary level	0.0200***	0.0454***	0.0484***	0.00275	0.115***
	(0.00619)	(0.00569)	(0.00659)	(0.00293)	(0.0135)
ZJC	0.0401***	0.0603***	0.0680***	0.00365	0.166***

	(0.00803)	(0.00766)	(0.00836)	(0.00383)	(0.0175)
O' level	0.0106	0.0411***	0.0659***	0.00317	0.118***
	(0.00724)	(0.00674)	(0.00760)	(0.00345)	(0.0157)
A' level	0.0110	0.0377*	0.0854***	0.0116	0.129**
	(0.0251)	(0.0224)	(0.0253)	(0.0130)	(0.0522)
Diploma/Certificate after primary	0.0365	0.105***	0.0158	0.0250	0.196**
	(0.0362)	(0.0359)	(0.0381)	(0.0198)	(0.0852)
Diploma/Certificate after secondary	0.0235	0.0408*	0.121***	0.00790	0.193***
	(0.0237)	(0.0210)	(0.0222)	(0.0114)	(0.0485)
Graduate/Post-Graduate	0.0341	0.0194	0.0661*	-0.0112	0.114
	(0.0355)	(0.0293)	(0.0338)	(0.0131)	(0.0706)
Household size	0.00526***	0.00358***	0.00441***	-0.000740	0.0134***
	(0.000998)	(0.000963)	(0.00105)	(0.000481)	(0.00220)
Household members with mental illness	0.0200***	0.0141***	0.00271	0.00366	0.0303***
	(0.00474)	(0.00511)	(0.00487)	(0.00266)	(0.0111)
Household members with chronic illness	0.0170***	0.0293***	0.0190***	0.0144***	0.0590***
	(0.00572)	(0.00602)	(0.00568)	(0.00334)	(0.0131)
Mashonaland Central	0.0777***	0.0925***	0.136***	-0.0132***	0.298***
	(0.00874)	(0.00770)	(0.00916)	(0.00402)	(0.0186)
Mashonaland East	0.159***	0.0956***	0.166***	-0.00118	0.428***
	(0.00842)	(0.00733)	(0.00891)	(0.00413)	(0.0179)
Mashonaland West	0.120***	0.0917***	0.123***	0.00900*	0.347***
	(0.00897)	(0.00802)	(0.00957)	(0.00461)	(0.0195)
Matabeleland North	0.101***	0.108***	0.133***	0.000598	0.353***
	(0.00902)	(0.00802)	(0.00952)	(0.00440)	(0.0194)
Matabeleland South	0.141***	0.112***	0.0195*	0.00734	0.290***
	(0.00917)	(0.00821)	(0.0100)	(0.00457)	(0.0204)
Midlands	0.0263***	0.0558***	0.0124	-0.0166***	0.0834***
	(0.00830)	(0.00728)	(0.00959)	(0.00393)	(0.0184)
Masvingo	0.109***	0.118***	0.101***	-0.00824*	0.332***
	(0.00914)	(0.00784)	(0.00958)	(0.00421)	(0.0199)
Constant	-0.000141	-0.161***	0.280***	0.0466***	0.113***
	(0.0180)	(0.0162)	(0.0185)	(0.00845)	(0.0390)
Observations	39,253	39,147	39,592	39,126	40,296
R-squared	0.299	0.128	0.115	0.007	0.285

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.2.3 Severity of the impact of economic stressors

The Economic Stress Index (ESI) gives the public and policymakers a broad view of the state of the economy. The higher the number, the worse the economy is. The lower the number, meaning there is less stress, the better the economy is. This section looks at the proportion that listed the aforementioned economic shock effect on their livelihoods as severe.

6.2.3.1 Descriptive analysis of severity of economic stressors

Table 12 reveals a declining economic situation as the ESI significantly increase from 0.349 in 2017 to 1.818 in 2019. The results further show that for those affected by the shock, loss of employment had the highest proportion of the sampled households that listed the shock impact as severe and livestock price change affected the lowest proportion of households.

The increase in severity of the economic stressors was statistically valid with a 99% level of confidence. The observed trends in Table 12 are also confirmed by the inferential analysis presented in Table 13. Appendix 7 gives the progression in the severity of economic stressors across the three years under analysis.

Table 12. Descriptive analysis of the severity of economic stressors

Shock & Stress	2017		2018		2019		P-Value
	Mean	S. D	Mean	S. D	Mean	S. D	
Cereal price change	0.370	0.483	0.679	0.467	0.902	0.297	0.000
Livestock price change	0.332	0.472	0.599	0.490	0.866	0.341	0.000
Cash shortage	0.632	0.482	0.809	0.393	0.909	0.288	0.000
Loss of employment	0.670	0.471	0.847	0.360	0.938	0.241	0.000
Economic stressors index [0 - 4]	0.349	0.562	1.037	0.983	1.818	1.039	0.000

6.2.3.2 Inferential analysis of the trends in severity of economic stressors

Table 13 confirms positive year on year and general trends in the severity of all economic shocks at the 1% level of significance. Furthermore, at the 1% significance level, an increase in the age of household head by one year was likely to decrease the severity of the following economic stressors; cereal price change (0.06%), cash shortage (0.06%), loss of employment (0.28%) and Economic stressors index by (0.001 points). Appendix 8 shows the probit estimates of the year on year and general trends in the severity of economic stressors.

Table 13. OLS estimates of year on year and general trends in the severity of the impact of economics stressors

VARIABLES	Cereal price change	Livestock price change	Cash shortage	Loss employment	Economic shocks index [0 - 4]
	(I)	(II)	(III)	(IV)	(V)
Survey year is 2019 [1 if Yes, 0 if No]	0.535***	0.526***	0.277***	0.247***	1.457***
	(0.0137)	(0.0259)	(0.00738)	(0.0274)	(0.0103)
Survey year is 2018 [1 if Yes, 0 if No]	0.315***	0.266***	0.179***	0.170***	0.693***
	(0.0147)	(0.0269)	(0.00787)	(0.0285)	(0.00978)
General Trends	0.247***	0.262***	0.132***	0.120***	0.730***
	(0.00512)	(0.00841)	(0.00336)	(0.0130)	(0.00526)
Household head is female [1 if Yes, 0 if No]	0.00532	0.0145*	0.00137	-0.0211	0.0122
	(0.00564)	(0.00875)	(0.00447)	(0.0175)	(0.0102)
Household head age [Years]	-0.000645***	-0.000283	-0.000566***	-0.00287***	-0.00100***
	(0.000196)	(0.000297)	(0.000162)	(0.000681)	(0.000323)
Married living together	0.0483***	-0.00865	0.0163	0.0695	0.120***
	(0.0180)	(0.0262)	(0.0142)	(0.0560)	(0.0305)

Married living apart	0.0210	-0.0243	-0.0246	0.0485	-0.0172
	(0.0205)	(0.0306)	(0.0164)	(0.0629)	(0.0341)
Divorced/separated	0.0525**	0.00899	0.0397**	0.0662	0.0695**
	(0.0209)	(0.0318)	(0.0166)	(0.0656)	(0.0354)
Widow/widower	0.0618***	0.0153	0.0226	0.110*	0.0629*
	(0.0195)	(0.0289)	(0.0153)	(0.0586)	(0.0326)
Primary level	-0.0185**	-0.00171	-0.0112*	-0.0906***	0.0657***
	(0.00811)	(0.0131)	(0.00668)	(0.0253)	(0.0128)
ZJC	-0.0161	-0.00304	-0.0214**	-0.0813**	0.104***
	(0.0103)	(0.0162)	(0.00863)	(0.0327)	(0.0171)
O' level	-0.0374***	0.00303	-0.0121	-0.0928***	0.0624***
	(0.00949)	(0.0151)	(0.00768)	(0.0297)	(0.0152)
Diploma/Certificate after secondary	-0.0966***	-0.0148	-0.0761***	-0.123	0.0376
	(0.0348)	(0.0500)	(0.0269)	(0.0953)	(0.0481)
Household members with mental illness	0.0130**	0.0139*	0.0122**	0.0224	0.0454***
	(0.00534)	(0.00810)	(0.00474)	(0.0155)	(0.0110)
Household members with chronic illness	0.00461	0.0249***	0.00140	0.0313*	0.0525***
	(0.00653)	(0.00937)	(0.00564)	(0.0168)	(0.0129)
Mashonaland Central	-0.0371***	-0.0300	-0.0130	-0.0968**	0.212***
	(0.0120)	(0.0196)	(0.00889)	(0.0381)	(0.0177)
Mashonaland East	-0.00515	-0.0172	-0.0286***	-0.0361	0.315***
	(0.0112)	(0.0186)	(0.00876)	(0.0324)	(0.0173)
Mashonaland West	-0.0282**	-0.0152	-0.0706***	-0.0836**	0.210***
	(0.0119)	(0.0196)	(0.00971)	(0.0328)	(0.0188)
Matabeleland North	0.0148	0.0390**	0.0137	0.0256	0.311***
	(0.0116)	(0.0184)	(0.00897)	(0.0332)	(0.0184)
Matabeleland South	-0.0225*	-0.0463**	-0.0302***	-0.126***	0.161***
	(0.0121)	(0.0198)	(0.0101)	(0.0360)	(0.0191)
Midlands	-0.0349***	-0.0584***	-0.0704***	0.0135	0.0313*
	(0.0119)	(0.0196)	(0.00992)	(0.0346)	(0.0175)
Masvingo	0.0143	0.0405**	-0.00689	0.0274	0.279***
	(0.0120)	(0.0185)	(0.00927)	(0.0302)	(0.0192)
Constant	0.375***	0.367***	0.674***	0.881***	-0.0141
	(0.0262)	(0.0433)	(0.0191)	(0.0744)	(0.0376)
Observations	18,801	9,139	27,072	1,634	40,296
R-squared	0.151	0.132	0.076	0.106	0.314

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.3 Social related stressors

Social stress can be broadly defined as a situation which threatens one's relationships, esteem, or sense of belonging within a group or larger social context. Social stress can stem from difficult social interactions, for example, a conflictual or tumultuous marital or family relationship[9]. Social stress can also emerge in the context of evaluated performance situations, where others could be judgmental or critical, or in contexts in which one feels rejected, ostracized, or ignored.

6.3.1 Incidence of social stressors

6.3.1.1 Descriptive analysis of incidence of social stressors

The results presented in Table 14 show an increase in the incidence of social conflict in the sampled households from 2.4% in 2017 to 4.2% in 2018. However, there was a decrease in the incidences of social conflict from 4.2% in 2018 to 2.2% in 2019. The mean differences were statistically valid with a 99% level of confidence.

Table 14. Descriptive analysis of the incidence of social stressors

Year	Variable	Mean	S. D
2019	Social conflict	0.022	0.147
2018	Social conflict	0.042	0.200
2017	Social conflict	0.024	0.153
	P - Value	0.000	

6.3.1.2 Inferential analysis of the trends on incidence of social stressors

Inferential analysis presented in Table 15 reveals that the increase in the incidences of social conflict between 2017 and 2018 was statistically significant at the 1% level of significance and the decrease between 2018 and 2019 was significant at 5% level of significance. Furthermore, the table denotes a declining general trend in the incidences of social stressors at the 1% level of significance.

Table 15 further shows that at the 1% level of significance, an increase in the age of the household head by one year decreased the incidence of social conflict by 0.53%. More so, the results show that at the 1% level of significance, female headed households were 0.53% more likely to experience social conflict as compared to male headed households.

Table 15. OLS and probit estimates of year on year and general trends in social stressors

VARIABLES	OLS (I)	Probit (II)
Survey year is 2019 [1 if Yes, 0 if No]	-0.00394**	-0.0719**
	(0.00200)	(0.0366)
Survey year is 2018 [1 if Yes, 0 if No]	0.0174***	0.242***
	(0.00225)	(0.0334)
General trends	-0.00302***	-0.0489***
	(0.000998)	(0.0152)
Household head is female [1 if Yes, 0 if No]	0.00532***	0.0801***
	(0.00181)	(0.0287)

Household head age [Years]	-0.000276***	-0.00411***
	(5.90e-05)	(0.000948)
Household members with chronic illness	0.00797***	0.102***
	(0.00272)	(0.0319)
Mashonaland Central	-0.0121***	-0.268***
	(0.00284)	(0.0623)
Mashonaland West	0.0225***	0.291***
	(0.00395)	(0.0516)
Midlands	0.00614*	0.105*
	(0.00337)	(0.0535)
Masvingo	0.0228***	0.296***
	(0.00389)	(0.0514)
Constant	0.0267***	-1.951***
	(0.00714)	(0.106)
Observations	39,157	39,157
R-squared	0.009	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.3.2 Severity of social conflict shocks

6.3.2.1 Descriptive analysis of severity of social conflict shocks

Table 16 indicates a decrease in the severity of social conflict between 2017 (0.0556) and 2018 (0.440) and then an increase from 0.440 in 2018 to 0.608 in 2019. Both the decrease and increase were not statistically significant.

Table 16. Severity of social conflict shocks

Year	Variable	Mean	S. D
2017	Social conflict	0.556	0.498
2018	Social conflict	0.440	0.497
2019	Social conflict	0.608	0.489
	P-value	0.935	

6.3.2.1 Inferential analysis of trends in severity of social conflict

The results of the inferential analysis presented Table 17 show that the decrease in severity of social conflict between 2017 and 2018 was statistically significant at the 1% level of significance. In addition, the results indicate that at the 5% level of significance, social conflict was higher in households headed by divorced/separated persons and for households located in Mashonaland Central and Mashonaland West provinces.

Table 17. OLS and Probit estimates of year on year trends in severity of social conflict

VARIABLES	OLS	Probit
	(I)	(II)
Survey year is 2019 [1 if Yes, 0 if No]	0.0396	0.103
	(0.0430)	(0.113)
Survey year is 2018 [1 if Yes, 0 if No]	-0.114***	-0.298***
	(0.0387)	(0.0998)
General trend	0.0290	0.0747
	(0.0215)	(0.0556)
Household head is female [1 if Yes, 0 if No]	-0.00197	-0.0104
	(0.0319)	(0.0832)
Household head age [Years]	0.00124	0.00319
	(0.00109)	(0.00285)
Divorced/separated	0.241**	0.667**
	(0.0974)	(0.269)
Household size	-0.00247	-0.00639
	(0.00660)	(0.0173)
Mashonaland Central	-0.152**	-0.397**
	(0.0751)	(0.198)
Mashonaland East	-0.0582	-0.152
	(0.0626)	(0.163)
Mashonaland West	-0.145**	-0.377**
	(0.0577)	(0.153)
Constant	0.496***	-0.00698
	(0.114)	(0.300)
Observations	1,141	1,141
R-squared	0.055	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.4.1 Incidence of crop and livestock diseases

6.4.1.1 Descriptive analysis of the incidences of crop and livestock diseases

The results presented in

Table 18 show a significant increase in the incidences of crop and livestock shocks for the period under review. In particular, the incidence of livestock diseases increased from 9.3% in 2017 to 24.7% in 2019, livestock deaths increased from 8.6% to 23.5%, crop pests increased from 29.9% to 44.1% and the livestock and crop shock index from 0.446 points in 2017 to 0.918 points in 2019. The increase in all these shocks was statistically valid with a 99% level of confidence. A pictorial representation of the trends in shocks related to crops and livestock is shown in Appendix 10.

Table 18. Descriptive analysis of the incidences of crop and livestock shocks

Type of shock	2017		2018		2019		P - value
	Mean	S. D	Mean	S. D	Mean	S. D	
Livestock diseases	0.093	0.290	0.182	0.386	0.247	0.431	0.000
Livestock deaths	0.086	0.280	0.223	0.416	0.235	0.424	0.000
Crop pests	0.299	0.458	0.447	0.497	0.441	0.496	0.000
Livestock and crop shock index [0 – 3]	0.446	0.685	0.847	0.976	0.918	1.018	0.000

6.4.1.2 Inferential analysis of trends in the incidence of crop and livestock shocks

Table 19 show the results of inferential analysis of the trends in the incidences of crop and livestock shocks. The results reveal that at the 1% level of significance, the year to year increase in the incidence of crop and livestock shocks was significant for the period under review. The positive general trend in all the crop and livestock shocks was also statistically valid at the 1% level of significance.

In addition, the results show that increasing the age of household head by one year increased the probability of an increase in all the crop and livestock shocks. More so, at the 1% level of significance an increase in household size by one member increased the incidences of all the crop and livestock shocks. Furthermore, Table 19 indicates that at the 1% level of significance, the probability for an increase in the incidence of all the crop and livestock shocks was high in all the provinces compared to the base province of Manicaland. Probit estimates of year on year trends in the incidences of crop and livestock related shocks are shown in Appendix 11.

Table 19. OLS estimates of year on year and general trends in the incidences of crop and livestock shocks

VARIABLES	Livestock diseases	Livestock deaths	Crop pests	Livestock and crop shock index [0 – 3]
	(I)	(III)	(IV)	(V)
Survey year is 2019 [1 if Yes, 0 if No]	0.161***	0.156***	0.150***	0.497***
	(0.00463)	(0.00455)	(0.00602)	(0.0106)
Survey year is 2018 [1 if Yes, 0 if No]	0.0953***	0.145***	0.160***	0.427***
	(0.00432)	(0.00445)	(0.00600)	(0.0103)
General trend	0.0798***	0.0744***	0.0710***	0.242***
	(0.00235)	(0.00232)	(0.00301)	(0.00538)
Household head is female [1 if Yes, 0 if No]	-0.00198	-0.00183	-0.00937*	-0.0106
	(0.00421)	(0.00427)	(0.00509)	(0.00989)
Household head age [Years]	0.00217***	0.00217***	0.00106***	0.00533***

	(0.000137)	(0.000140)	(0.000169)	(0.000320)
Married living together	0.00380	-0.0271**	0.0477***	0.0271
	(0.0110)	(0.0123)	(0.0143)	(0.0277)
Married living apart	-0.00755	-0.0189	0.0165	-0.00747
	(0.0125)	(0.0138)	(0.0161)	(0.0311)
Divorced/separated	-0.0448***	-0.0778***	-0.0408**	-0.156***
	(0.0127)	(0.0139)	(0.0169)	(0.0318)
Widow/widower	-0.0218*	-0.0422***	0.0278*	-0.0310
	(0.0121)	(0.0133)	(0.0154)	(0.0299)
Primary level	0.0365***	0.0299***	0.0271***	0.0916***
	(0.00559)	(0.00575)	(0.00696)	(0.0132)
ZJC	0.0491***	0.0424***	0.0469***	0.134***
	(0.00736)	(0.00751)	(0.00913)	(0.0173)
O' level	0.0435***	0.0375***	0.0285***	0.106***
	(0.00647)	(0.00660)	(0.00817)	(0.0153)
A' level	0.0384*	0.0404*	0.0381	0.102**
	(0.0210)	(0.0217)	(0.0277)	(0.0517)
Diploma/Certificate after primary	0.0644*	0.0510	-0.0476	0.0740
	(0.0341)	(0.0335)	(0.0377)	(0.0764)
Diploma/Certificate after secondary	0.0369*	0.0192	-0.00905	0.0408
	(0.0196)	(0.0199)	(0.0246)	(0.0474)
Graduate/Post-Graduate	0.00518	-0.00389	-0.0954***	-0.0908
	(0.0270)	(0.0286)	(0.0332)	(0.0681)
Household size	0.0114***	0.0131***	0.0204***	0.0447***
	(0.000942)	(0.000971)	(0.00113)	(0.00219)
Household members with mental illness	0.00502	0.0114**	0.00440	0.0109
	(0.00489)	(0.00503)	(0.00566)	(0.0113)
Household members with chronic illness	0.0365***	0.0350***	0.0225***	0.0755***
	(0.00585)	(0.00603)	(0.00654)	(0.0131)
Mashonaland Central	0.0656***	0.0452***	0.237***	0.344***
	(0.00717)	(0.00747)	(0.00949)	(0.0171)
Mashonaland East	0.0538***	0.0294***	0.0899***	0.176***
	(0.00678)	(0.00707)	(0.00894)	(0.0160)
Mashonaland West	0.0845***	0.0469***	0.141***	0.271***
	(0.00758)	(0.00773)	(0.00975)	(0.0179)
Matabeleland North	0.0827***	0.0609***	0.0546***	0.203***
	(0.00775)	(0.00797)	(0.00974)	(0.0182)
Matabeleland South	0.0350***	0.0818***	-0.00961	0.113***
	(0.00735)	(0.00814)	(0.00943)	(0.0176)
Midlands	0.0650***	0.0310***	0.163***	0.256***
	(0.00723)	(0.00745)	(0.00945)	(0.0172)
Masvingo	0.108***	0.0788***	0.286***	0.477***
	(0.00775)	(0.00798)	(0.00962)	(0.0182)
Constant	-0.167***	-0.136***	-0.0380**	-0.368***
	(0.0144)	(0.0154)	(0.0183)	(0.0347)
Observations	39,302	39,180	39,474	40,296
R-squared	0.050	0.050	0.075	0.094

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.4.2 Severity of crop and livestock diseases

6.4.2.1 Descriptive analysis of the severity of crop and livestock diseases

Regarding the severity of the incidence of shocks presented in

Table 18, Table 20 shows that the severity of all the crop and livestock shocks significantly increased during the period under review. The increase was statistically valid with a 99% level of confidence. A pictorial representation of the severity of crop and livestock related shocks is shown in Appendix 13 of this study.

Table 20. Descriptive analysis of the severity of crop and livestock shocks

Shock	Mean	D. S	Mean	S. D	Mean	S. D	P - Value
Livestock disease	0.490	0.500	0.527	0.499	0.695	0.461	0.000
Livestock deaths	0.472	0.499	0.602	0.490	0.692	0.462	0.000
Crop pests	0.487	0.500	0.630	0.483	0.704	0.456	0.000
Livestock and crop shock index [0 – 3]	0.211	0.488	0.509	0.795	0.642	0.886	0.000

6.4.2.2 Inferential analysis of trends in the severity of crop and livestock shocks

The inferential analysis results presented in Table 21 indicate that compared to the base year of 2017, the severity of all livestock and crop shocks in 2019 increased at the 1% level of significance. Furthermore, compared to the base year of 2017, the shock severity in 2018 was also more severe. The general trend in the severity of crop and livestock shocks was positive at the 1% level of significance.

The table further shows that an increase in the age of household head by one year decreased the severity of crop pests by 0.13%. At the 1% level of significance, except for Matabeleland South, households in all the other provinces were likely to experience an increase in the severity of livestock and crop shock index than the base province of Manicaland. Probit estimates of the year on year trends in the severity of crop and livestock related shocks is shown in Appendix 13 and those for the general trends are shown in Appendix 15.

Table 21. OLS estimates of year on year trend in the severity of crop and livestock shocks

VARIABLES	Livestock diseases	Livestock deaths	Crop pests	Livestock and crop shock index [0 – 3]
	(I)	(II)	(III)	(IV)
Survey year is 2019 [1 if Yes, 0 if No]	0.198***	0.216***	0.213***	0.443***

	(0.0185)	(0.0192)	(0.0108)	(0.00874)
Survey year is 2018 [1 if Yes, 0 if No]	0.0335*	0.126***	0.149***	0.313***
	(0.0193)	(0.0194)	(0.0108)	(0.00808)
General trend	0.117***	0.102***	0.101***	0.218***
	(0.00842)	(0.00848)	(0.00524)	(0.00445)
Household head is female [1 if Yes, 0 if No]	0.00957	0.0145	0.00428	0.000169
	(0.0117)	(0.0114)	(0.00785)	(0.00842)
Household head age [Years]	-0.000860**	0.000122	-0.00132***	0.00275***
	(0.000406)	(0.000396)	(0.000270)	(0.000267)
Married living together	0.0709*	0.108***	-0.00406	0.0372*
	(0.0420)	(0.0374)	(0.0272)	(0.0220)
Married living apart	0.0691	0.0827**	-0.0614**	-0.0103
	(0.0470)	(0.0417)	(0.0303)	(0.0248)
Divorced/separated	0.0399	0.110**	-0.0339	-0.0917***
	(0.0515)	(0.0467)	(0.0328)	(0.0254)
Widow/widower	0.0620	0.0655*	-0.0223	-0.0167
	(0.0443)	(0.0396)	(0.0289)	(0.0239)
Primary level	-0.00716	-0.0428***	-0.0491***	0.0298***
	(0.0167)	(0.0158)	(0.0109)	(0.0110)
ZJC	-0.0358*	-0.0630***	-0.0804***	0.0336**
	(0.0215)	(0.0206)	(0.0141)	(0.0145)
O' level	-0.0283	-0.0851***	-0.0845***	0.0124
	(0.0198)	(0.0191)	(0.0127)	(0.0127)
A' level	-0.0549	-0.00314	-0.0669	0.0296
	(0.0668)	(0.0642)	(0.0432)	(0.0424)
Diploma/Certificate after primary	-0.133	-0.156*	-0.104	-0.0481
	(0.0941)	(0.0930)	(0.0733)	(0.0540)
Diploma/Certificate after secondary	-0.126**	-0.143**	-0.190***	-0.102***
	(0.0612)	(0.0644)	(0.0419)	(0.0363)
Graduate/Post-Graduate	0.182**	0.000244	-0.0626	-0.0604
	(0.0901)	(0.0947)	(0.0721)	(0.0600)
Household size	-6.69e-05	-0.00270	0.00366**	0.0286***
	(0.00255)	(0.00246)	(0.00174)	(0.00184)
Household members with mental illness	0.0247**	0.00352	0.00213	0.0156
	(0.0111)	(0.0112)	(0.00811)	(0.00970)
Household members with chronic illness	0.00962	0.0437***	0.0203**	0.0669***
	(0.0126)	(0.0119)	(0.00905)	(0.0113)
Mashonaland Central	-0.0618**	0.00152	-0.0984***	0.173***
	(0.0260)	(0.0249)	(0.0158)	(0.0143)
Mashonaland East	-0.0606**	0.0490**	-0.138***	0.0741***
	(0.0255)	(0.0244)	(0.0165)	(0.0132)
Mashonaland West	-0.0519**	0.0226	-0.159***	0.115***
	(0.0259)	(0.0254)	(0.0171)	(0.0150)
Matabeleland North	-0.0750***	0.0112	-0.0994***	0.0702***
	(0.0258)	(0.0249)	(0.0182)	(0.0148)
Matabeleland South	-0.108***	-0.0248	-0.0456**	0.0218
	(0.0279)	(0.0246)	(0.0188)	(0.0144)
Midlands	-0.0806***	0.00647	-0.00863	0.166***
	(0.0256)	(0.0250)	(0.0157)	(0.0144)
Masvingo	-0.0553**	0.0396	0.00428	0.322***
	(0.0254)	(0.0244)	(0.0156)	(0.0158)
Constant	0.542***	0.410***	0.664***	-0.232***

	(0.0538)	(0.0501)	(0.0349)	(0.0283)
Observations	7,146	7,459	15,921	40,296
R-squared	0.040	0.032	0.048	0.083

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.3 Health related shocks

6.3.2 Descriptive analysis of the incidences of health-related shocks

Overall, the results presented in Table 22 reveal a significant increase, at the 99% confidence level, in all health-related shocks from 2017 to 2018 and then a significant decrease from 2018 to 2019. The health-related shocks index shows the same trend, increasing from 0.259 in 2017 to 0.422 in 2018 and a decrease to 0.319 in 2019. A pictorial presentation of the trends in the incidences of health-related shocks is shown in Appendix 16 of this study.

Table 22. Descriptive analysis of the incidences of health-related shocks

Shock	2017		2018		2019		P - Value
	Mean	D. S	Mean	S. D	Mean	S. D	
Death of breadwinner	0.029	0.167	0.047	0.213	0.028	0.164	0.000
HIV/AIDS	0.052	0.221	0.103	0.303	0.089	0.285	0.000
Diarrheal diseases	0.030	0.170	0.075	0.263	0.062	0.241	0.000
Malaria	0.049	0.215	0.106	0.308	0.072	0.259	0.000
Any other health related	0.124	0.330	0.093	0.290	0.069	0.253	0.000
Health related shocks [0 - 5]	0.259	0.532	0.422	0.725	0.319	0.596	0.000

6.3.3 Inferential analysis of year on year and general trends in the incidences of health-related shocks

Table 23 shows that the year to year and general trends in the incidence HIV/AIDS, diarrheal diseases, and malarial diseases had been increasing in the period under analysis. On the other hand, there was a general decline in the incidences of any other health related diseases shocks at the 1% level of significance.

The results also show that households headed by older persons were likely to experience reduced incidences of diarrheal diseases by 0.09%, reduced incidences of malaria disease by 0.01% and likely to experience an increase in health-related shocks by 0.21%. In addition, the results reveal that at the 1% level of significance, increasing household size by one

member was likely to increase the incidence of HIV/AIDS by 0.2%, diarrheal diseases by 0.14% and health related morbidity by 0.37%. **Table 23** also shows that households with chronically ill members had an increased propensity for incidences of all health-related shocks. Probit estimates of the general trend in the mortality and morbidity trends are shown in **Appendix 18** of this study.

Table 23. OLS estimates of year on year and general trends in the incidences of health-related shocks

VARIABLES	Death breadwinner	HIV/AIDS	Diarrheal diseases	Malaria diseases	Health related	Health related shocks [0 - 5]
	(I)	(II)	(III)	(IV)	(V)	(VI)
Survey year is 2019 [1 if Yes, 0 if No]	-0.000709	0.0352***	0.0264***	0.0197***	-0.0527***	0.0578***
	(0.00230)	(0.00335)	(0.00265)	(0.00303)	(0.00392)	(0.00723)
Survey year is 2018 [1 if Yes, 0 if No]	0.0171***	0.0503***	0.0438***	0.0580***	-0.0320***	0.164***
	(0.00237)	(0.00336)	(0.00277)	(0.00332)	(0.00402)	(0.00778)
General trend	-0.00132	0.0158***	0.0115***	0.00725***	-0.0261***	0.0239***
	(0.00116)	(0.00170)	(0.00135)	(0.00153)	(0.00193)	(0.00364)
Household head is female [1 if Yes, 0 if No]	0.00114	-0.000280	0.00601**	0.00304	0.00252	0.0124*
	(0.00211)	(0.00309)	(0.00251)	(0.00277)	(0.00300)	(0.00666)
Household head age [Years]	-0.000123*	-5.11e-05	-0.000945***	-0.00104***	0.00217***	8.98e-05
	(6.76e-05)	(9.55e-05)	(8.22e-05)	(9.20e-05)	(0.000110)	(0.000220)
Married living together	-0.0397***	-0.0195**	0.0205***	0.0182**	-0.0408***	-0.0595***
	(0.00726)	(0.00934)	(0.00686)	(0.00776)	(0.00862)	(0.0212)
Married living apart	-0.0302***	-0.0199*	0.00799	0.000483	-0.0390***	-0.0792***
	(0.00772)	(0.0102)	(0.00760)	(0.00848)	(0.00948)	(0.0228)
Divorced/separated	-0.0138	0.0253**	0.0151*	0.00451	-0.0404***	-0.00869
	(0.00841)	(0.0114)	(0.00835)	(0.00931)	(0.0102)	(0.0252)
Widow/widower	0.0445***	0.0314***	0.0131*	-0.00244	-0.0355***	0.0508**
	(0.00829)	(0.0104)	(0.00734)	(0.00822)	(0.00965)	(0.0232)
Primary level	0.00443	0.0132***	-0.0129***	-0.0170***	0.0158***	0.00261
	(0.00306)	(0.00425)	(0.00347)	(0.00394)	(0.00462)	(0.00956)
ZJC	0.00825**	0.0172***	-0.0208***	-0.0215***	0.0168***	-0.00151
	(0.00369)	(0.00550)	(0.00454)	(0.00525)	(0.00572)	(0.0122)
O' level	-0.000105	0.00439	-0.0278***	-0.0447***	0.0108**	-0.0579***
	(0.00317)	(0.00480)	(0.00418)	(0.00470)	(0.00503)	(0.0108)
A' level	0.00234	-0.00770	-0.0234*	-0.0580***	0.00399	-0.0850***
	(0.00872)	(0.0136)	(0.0142)	(0.0141)	(0.0141)	(0.0310)
Diploma/Certificate after primary	0.0222	-0.00301	-0.00620	-0.00701	0.0640**	0.0746

	(0.0171)	(0.0202)	(0.0183)	(0.0213)	(0.0297)	(0.0605)
Diploma/Certificate after secondary	-0.00736	-0.0303***	-0.0316***	-0.0566***	0.00532	-0.121***
	(0.00699)	(0.0101)	(0.0108)	(0.0112)	(0.0145)	(0.0269)
Graduate/Post-Graduate	-0.00703	-0.0125	-0.0423***	-0.0664***	0.0376	-0.0898**
	(0.00888)	(0.0173)	(0.0132)	(0.0148)	(0.0243)	(0.0406)
Household size	-0.000367	0.00298***	0.00140***	0.00370***	0.00106	0.00899***
	(0.000467)	(0.000679)	(0.000541)	(0.000605)	(0.000742)	(0.00149)
Household members with mental illness	0.00368	-0.00621*	0.000294	0.00554	-0.000648	-0.0108
	(0.00228)	(0.00375)	(0.00313)	(0.00355)	(0.00420)	(0.00845)
Household members with chronic illness	0.00887***	0.0645***	0.0329***	0.0263***	0.0732***	0.179***
	(0.00285)	(0.00528)	(0.00421)	(0.00448)	(0.00562)	(0.0110)
Mashonaland Central	0.00405	0.0156***	0.0451***	0.100***	0.00954	0.169***
	(0.00343)	(0.00507)	(0.00518)	(0.00645)	(0.00588)	(0.0126)
Mashonaland East	0.00535	0.0149***	0.00569	0.0336***	-0.00656	0.0532***
	(0.00340)	(0.00484)	(0.00428)	(0.00540)	(0.00556)	(0.0114)
Mashonaland West	0.0154***	0.0363***	0.0542***	0.0207***	0.0170***	0.141***
	(0.00385)	(0.00558)	(0.00557)	(0.00573)	(0.00627)	(0.0133)
Matabeleland North	0.00679*	0.0449***	-0.0197***	-0.0351***	-0.0153**	-0.0143
	(0.00377)	(0.00574)	(0.00407)	(0.00473)	(0.00599)	(0.0120)
Matabeleland South	0.00610	0.0453***	-0.0175***	-0.0487***	-0.0202***	-0.0318***
	(0.00390)	(0.00580)	(0.00410)	(0.00441)	(0.00593)	(0.0121)
Midlands	0.00647*	0.00883*	-0.00712*	-0.0347***	-0.00754	-0.0300***
	(0.00357)	(0.00499)	(0.00424)	(0.00459)	(0.00585)	(0.0110)
Masvingo	0.00170	0.0383***	0.0212***	0.0223***	0.00453	0.0931***
	(0.00359)	(0.00558)	(0.00488)	(0.00563)	(0.00615)	(0.0125)
Constant	0.0451***	0.00787	0.0538***	0.0802***	0.0317***	0.188***
	(0.00861)	(0.0114)	(0.00897)	(0.0102)	(0.0117)	(0.0261)
Observations	39,112	39,140	39,100	39,157	39,220	40,296
R-squared	0.036	0.025	0.027	0.047	0.036	0.048

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.4 Impact severity of health-related shocks

6.4.1 Descriptive analysis of the severity of health-related shocks

Table 24 shows the severity of the health-related shocks over the period under review. The results reveal a significant increase in the proportion of households that experienced severe shock of death of the breadwinner for the period under review. In addition, the results indicate a significant increase in the severity index for health-related shocks from 0.136 in 2017 to 0.207 in 2018 and a significant decrease to 0.160 in 2019. A pictorial representation of the trends in the severity of the health-related shocks is shown in Appendix 19.

Table 24. Descriptive analysis of the severity of health-related shocks

Shock	Mean	D. S	Mean	S. D	Mean	S. D	P - Value
Death of breadwinner	0.715	0.452	0.893	0.309	0.957	0.204	0.000
HIV/AIDS	0.601	0.490	0.539	0.499	0.501	0.500	0.851
Diarrheal diseases	0.410	0.493	0.271	0.445	0.382	0.486	0.080
Malaria	0.420	0.494	0.395	0.489	0.426	0.495	0.910
Any other health related	0.554	0.497	0.522	0.500	0.507	0.500	0.975
Health related shocks [0 - 5]	0.136	0.388	0.207	0.525	0.160	0.437	0.000

6.4.2 Inferential analysis of year on year and the general trends in the incidences of health-related shocks

Table 25 shows the results of inferential analysis of year on year and the general trends in the incidences of health-related shocks. The results reveal that at the 1% level of significance, the impact of the death of the breadwinner increases by 16.8% between 2017 and 2018 and by 21.2% points between 2017 and 2019. A similar trend was observed for household morbidity as it increased by 7% between 2017 and 2018 and by 2% between 2018 and 2019. Furthermore,

Table 25 shows a significant decrease at the 1% level of significance on the impact of HIV/AIDS by 9% between 2018 and 2019. The results also reveal that households with chronic ill members had an increased propensity to experience severe impact due to the death of breadwinner, health related shocks and household morbidity, *ceteris paribus*. Probit estimates of the year on year trends in the severity of health-related shocks are shown in **Appendix 20** and those for the general trends in the morbidity are shown in **Appendix 21**.

Table 25. OLS estimates of year on year and the general trends in the severity of health related shocks

VARIABLES	Death breadwinner impact	HIV/AIDS impact	Diarrheal disease impact	Malaria Diseases impact	Health related impact	HH morbidity severity
	(I)	(II)	(III)	(IV)	(V)	(VI)
Survey year is 2019 [1 if Yes, 0 if No]	0.212***	-0.0996***	-0.0134	0.0441	-0.0495**	0.0227***
	(0.0292)	(0.0260)	(0.0342)	(0.0290)	(0.0221)	(0.00536)
Survey year is 2018 [1 if Yes, 0 if No]	0.168***	-0.0648**	-0.109***	0.00469	-0.0320	0.0705***
	(0.0285)	(0.0254)	(0.0329)	(0.0269)	(0.0201)	(0.00567)
General trend	0.106***	-0.0468***	0.0220	0.0257*	-0.0250**	0.00915***
	(0.0146)	(0.0125)	(0.0158)	(0.0139)	(0.0110)	(0.00270)
Household head is female [1 if Yes, 0 if No]	-0.00235	-0.0127	0.00304	-0.0159	0.00239	0.00327
	(0.0201)	(0.0180)	(0.0212)	(0.0196)	(0.0185)	(0.00500)
Household head age [Years]	0.000337	0.00117*	-0.00109	-0.000642	-0.00163***	1.97e-05
	(0.000565)	(0.000653)	(0.000747)	(0.000677)	(0.000603)	(0.000164)
Married living together	-0.151***	0.00552	0.0678	-0.0251	0.0669	-0.0450***
	(0.0403)	(0.0549)	(0.0639)	(0.0631)	(0.0583)	(0.0156)
Married living apart	-0.148***	0.0435	0.0217	-0.102	0.0830	-0.0516***
	(0.0569)	(0.0633)	(0.0735)	(0.0723)	(0.0667)	(0.0166)
Divorced/separated	-0.102**	0.0775	0.0812	0.0521	0.100	0.0101
	(0.0491)	(0.0616)	(0.0764)	(0.0738)	(0.0689)	(0.0188)
Widow/widower	-0.0283	0.0708	0.0986	-0.0244	0.0684	0.0595***
	(0.0357)	(0.0567)	(0.0696)	(0.0684)	(0.0604)	(0.0172)
Primary level	-0.0328	0.00266	-0.00842	-0.0725***	-0.0786***	-0.00821
	(0.0205)	(0.0243)	(0.0287)	(0.0258)	(0.0220)	(0.00721)
ZJC	-0.0102	0.0186	-0.0150	-0.0960***	-0.0663**	-0.00676
	(0.0301)	(0.0317)	(0.0374)	(0.0325)	(0.0309)	(0.00907)
O' level	-0.0227	-0.00394	-0.0295	-0.0878***	-0.0474*	-0.0357***
	(0.0318)	(0.0298)	(0.0325)	(0.0297)	(0.0286)	(0.00802)
A' level	-0.0322	-0.0690	-0.104	-0.139	-0.132	-0.0620***
	(0.138)	(0.125)	(0.103)	(0.109)	(0.119)	(0.0201)
Diploma/Certificate after primary	-0.0963	0.0237	-0.0389	-0.0154	-0.124	0.0244
	(0.116)	(0.168)	(0.150)	(0.149)	(0.104)	(0.0469)

Diploma/Certificate after secondary	0.0948**	0.0467	-0.253***	-0.364***	-0.224**	-0.100***
	(0.0380)	(0.135)	(0.0641)	(0.0783)	(0.0896)	(0.0170)
Graduate/Post-Graduate	-0.158	-0.156	-0.295***	-0.377**	-0.107	-0.0834***
	(0.380)	(0.169)	(0.0452)	(0.156)	(0.117)	(0.0247)
Household size	0.00141	-0.00965**	0.00338	-0.000513	-0.00903**	0.00243**
	(0.00373)	(0.00407)	(0.00493)	(0.00448)	(0.00363)	(0.00110)
Household members with mental illness	0.00339	-0.00378	0.00906	0.00340	0.0237	-0.00407
	(0.0191)	(0.0182)	(0.0210)	(0.0187)	(0.0161)	(0.00628)
Household members with chronic illness	0.0120	0.0539***	0.0228	0.0410**	0.0464***	0.113***
	(0.0200)	(0.0168)	(0.0210)	(0.0189)	(0.0157)	(0.00841)
Mashonaland Central	0.0357	-0.106***	-0.158***	-0.256***	0.0222	0.0270***
	(0.0361)	(0.0392)	(0.0398)	(0.0337)	(0.0333)	(0.00894)
Mashonaland East	0.0258	-0.109***	-0.0840*	-0.111***	-0.0347	0.00491
	(0.0370)	(0.0380)	(0.0444)	(0.0364)	(0.0335)	(0.00858)
Mashonaland West	-0.0679*	-0.179***	-0.0592	-0.114***	-0.0614*	0.0342***
	(0.0403)	(0.0383)	(0.0416)	(0.0385)	(0.0337)	(0.00987)
Matabeleland North	0.0812**	-0.106***	0.0168	-0.158***	-0.00995	-0.0143
	(0.0342)	(0.0372)	(0.0563)	(0.0490)	(0.0359)	(0.00907)
Matabeleland South	-0.0302	-0.0960***	-0.0216	-0.0166	0.0353	-0.0199**
	(0.0382)	(0.0372)	(0.0558)	(0.0619)	(0.0359)	(0.00923)
Midlands	0.0511	-0.110***	-0.0363	-0.120**	0.0289	-0.0203**
	(0.0352)	(0.0394)	(0.0477)	(0.0474)	(0.0334)	(0.00845)
Masvingo	-0.0195	-0.0908**	0.0159	-0.0787**	0.0422	0.0379***
	(0.0394)	(0.0376)	(0.0447)	(0.0383)	(0.0337)	(0.00945)
Constant	0.784***	0.654***	0.421***	0.653***	0.657***	0.139***
	(0.0599)	(0.0734)	(0.0850)	(0.0791)	(0.0708)	(0.0195)
Observations	1,337	3,279	2,253	3,043	3,598	40,296
R-squared	0.122	0.024	0.039	0.040	0.018	0.029

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

6.5 Climate related shocks

6.5.1 Descriptive analysis of the severity of health-related shocks

The results in

Table 26 show an increase in the incidence of drought during the period under review. In 2017, 32.4% of the sampled households experienced drought and the number increased to 76.1% in 2019. The climate related shock index decreased from 0.831 in 2017 to 0.801 in 2018 and then increased to 0.876 points in 2019. The difference was significant with 99% confidence level. A pictorial representation is shown in Appendix 22.

Table 26. Descriptive analysis of the incidences of climate related shocks

Shock	Mean	D. S	Mean	S. D	Mean	S. D	P - Value
Floods	0.095	0.293	0.021	0.145	0.031	0.172	0.000
Waterlogging	0.427	0.495	0.151	0.358	0.023	0.151	0.000
Hailstorm	0.034	0.181	0.027	0.163	0.022	0.148	0.000
Drought	0.324	0.468	0.547	0.498	0.761	0.427	0.000
Veld fires	0.009	0.092	0.058	0.233	0.043	0.202	0.000
Climate related shocks index [0 - 5]	0.831	0.800	0.801	0.764	0.876	0.578	0.000

6.5.2 Inferential analysis of year on year and the general trends in the incidences of climate-related shocks

The results presented in Table 27 show that at the 1% level of significance, the incidence of floods, waterlogging and hailstorm decreased during the period 2018 to 2019, while the incidence for drought and veld fires increased during the same period. A similar trend was observed for the period 2017 to 2018. The results also indicate that all things being constant, at the 1% level of significance, households in all provinces except for those in Midlands were likely to experience a reduced incidence of floods as compared to the base province of Manicaland. On the other hand, at the 1% level of significance, the incidence of drought was likely to increase in all provinces except for Mashonaland West as compared to the base province of Manicaland, *ceteris paribus*. Probit estimates of the year on year trends are given in Appendix 23 and those for the general trends are presented in Appendix 24.

Table 27. OLS estimates of year on year trend in the incidences of climate related shocks

VARIABLES	Floods	Waterlogging	Hailstorm	Drought	Veld fires	Climate related shocks index [0 - 5]
	(I)	(II)	(III)	(IV)	(V)	(VI)
Survey year is 2019 [1 if Yes, 0 if No]	-0.0653***	-0.400***	-0.0119***	0.441***	0.0323***	0.0497***
	(0.00319)	(0.00491)	(0.00216)	(0.00573)	(0.00193)	(0.00880)
Survey year is 2018 [1 if Yes, 0 if No]	-0.0727***	-0.271***	-0.00626***	0.231***	0.0468***	-0.0219**
	(0.00309)	(0.00555)	(0.00222)	(0.00608)	(0.00215)	(0.00964)
General trend	-0.0305***	-0.197***	-0.00595***	0.220***	0.0145***	0.0266***
	(0.00155)	(0.00237)	(0.00107)	(0.00285)	(0.000999)	(0.00435)
Household head is female [1 if Yes, 0 if No]	0.000938	0.000773	0.00102	-0.00234	-0.00183	0.000190
	(0.00205)	(0.00319)	(0.00171)	(0.00481)	(0.00208)	(0.00713)
Household head age [Years]	-6.31e-06	0.00103***	3.99e-05	0.000259	0.000135**	0.00151***
	(7.40e-05)	(0.000123)	(5.87e-05)	(0.000164)	(6.82e-05)	(0.000250)
Married living together	0.00115	0.0127	0.00290	0.0386***	0.00333	0.0626***
	(0.00627)	(0.00956)	(0.00525)	(0.0149)	(0.00610)	(0.0218)
Married living apart	-0.00649	0.0197*	-0.00309	0.0290*	-0.00522	0.0389
	(0.00697)	(0.0111)	(0.00577)	(0.0167)	(0.00657)	(0.0245)
Divorced/separated	-0.00406	-0.00419	0.00376	0.0263	-0.00636	0.0207
	(0.00735)	(0.0115)	(0.00623)	(0.0175)	(0.00698)	(0.0256)
Widow/widower	-0.00258	0.00546	0.00186	0.0578***	-0.00380	0.0642***
	(0.00682)	(0.0105)	(0.00568)	(0.0159)	(0.00642)	(0.0234)
Primary level	0.000199	0.0165***	0.00374	-0.0108	0.0153***	0.0234**
	(0.00310)	(0.00510)	(0.00228)	(0.00667)	(0.00257)	(0.0101)
ZJC	0.00129	0.0350***	0.0133***	-0.0248***	0.0182***	0.0374***
	(0.00402)	(0.00675)	(0.00329)	(0.00882)	(0.00364)	(0.0135)
O' level	-0.00343	0.0242***	0.00598**	-0.0474***	0.0146***	-0.00811
	(0.00355)	(0.00593)	(0.00271)	(0.00790)	(0.00321)	(0.0120)
A' level	-0.0110	0.0102	0.00175	-0.111***	0.00817	-0.111***
	(0.0109)	(0.0207)	(0.00876)	(0.0282)	(0.0102)	(0.0405)

Diploma/Certificate after primary	0.00309	-0.0393	0.00437	-0.132***	0.0220	-0.130**
	(0.0197)	(0.0295)	(0.0135)	(0.0353)	(0.0158)	(0.0643)
Diploma/Certificate after secondary	-0.0172*	-0.00696	-0.00539	-0.141***	0.0261**	-0.142***
	(0.00931)	(0.0185)	(0.00681)	(0.0249)	(0.0115)	(0.0364)
Graduate/Post-Graduate	0.00180	0.00625	0.00125	-0.138***	0.0335*	-0.103*
	(0.0163)	(0.0268)	(0.0117)	(0.0366)	(0.0174)	(0.0590)
Household size	0.000462	0.00530***	0.000224	0.0141***	-0.000487	0.0199***
	(0.000509)	(0.000857)	(0.000389)	(0.00109)	(0.000449)	(0.00167)
Household members with mental illness	0.00516*	-0.00595	0.00247	0.00100	0.00890***	0.000804
	(0.00280)	(0.00388)	(0.00219)	(0.00525)	(0.00266)	(0.00833)
Household members with chronic illness	0.00541*	0.00933**	0.00410	0.0299***	0.00336	0.0318***
	(0.00323)	(0.00471)	(0.00278)	(0.00612)	(0.00302)	(0.00968)
Mashonaland Central	-0.0569***	-0.0265***	-0.00897***	0.0880***	0.0357***	0.0343***
	(0.00436)	(0.00598)	(0.00264)	(0.00960)	(0.00322)	(0.0130)
Mashonaland East	-0.0560***	0.0663***	0.00510*	0.0662***	0.0429***	0.133***
	(0.00435)	(0.00647)	(0.00300)	(0.00917)	(0.00319)	(0.0132)
Mashonaland West	-0.0457***	0.0440***	0.0182***	0.000635	0.0910***	0.111***
	(0.00470)	(0.00695)	(0.00363)	(0.00953)	(0.00468)	(0.0148)
Matabeleland North	-0.0228***	0.0896***	0.0157***	0.166***	0.0214***	0.282***
	(0.00509)	(0.00692)	(0.00351)	(0.00980)	(0.00289)	(0.0148)
Matabeleland South	-0.0208***	0.0585***	0.0161***	0.191***	0.0179***	0.273***
	(0.00510)	(0.00679)	(0.00353)	(0.00953)	(0.00277)	(0.0143)
Midlands	-0.00988*	0.128***	-0.00269	0.117***	0.0282***	0.268***
	(0.00517)	(0.00715)	(0.00286)	(0.00929)	(0.00298)	(0.0143)
Masvingo	-0.0261***	0.142***	0.00736**	0.0892***	0.00462**	0.233***
	(0.00507)	(0.00752)	(0.00326)	(0.0100)	(0.00217)	(0.0148)
Constant	0.123***	0.258***	0.0163**	0.129***	-0.0398***	0.421***
	(0.00838)	(0.0131)	(0.00635)	(0.0189)	(0.00744)	(0.0278)
Observations	39,222	39,503	39,230	39,451	39,141	40,296
R-squared	0.033	0.203	0.005	0.151	0.030	0.036

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.6 Severity of climate related shocks

6.6.1 Descriptive analysis of the severity of climate-related shocks

The results in Table 28 reveal a significant increase in severity of drought at the 99% level of confidence from 68.3% in 2017 to 88.4% in 2019. Similarly, at the 99% level of confidence, the results indicated an increase of the climate related shocks index from 0.498 in 2017 to 0.738. A pictorial representation of the severity is given in Appendix 25.

Table 28. Descriptive analysis of the severity of climate related shocks

Shock	Mean	D. S	Mean	S. D	Mean	S. D	P - Value
Floods	0.564	0.496	0.563	0.497	0.617	0.487	0.879
Waterlogging	0.580	0.494	0.582	0.493	0.590	0.492	0.998
Hailstorm	0.480	0.500	0.364	0.482	0.473	0.500	0.707
Drought	0.683	0.465	0.725	0.447	0.884	0.320	0.000
Veld fires	0.505	0.503	0.384	0.487	0.595	0.491	0.905
Climate related shocks index [0 - 5]	0.498	0.681	0.526	0.653	0.738	0.553	0.000

6.6.2 Inferential analysis of year on year and the general trends in the severity of climate related shocks

Table 29 presents inferential analysis results for the trends in the severity of climate related shocks. The results reveal a significant increase in the impact of drought by 20% and an increase in household climate severity index by 24.2% between 2018 and 2019, at the 1% level of significance. The results also show that at the 1% level of significance, the impact/severity of drought increased by 4.17% between 2017 and 2018 and household climate severity index increased by 3.54% during the same period. Overall, the general trend during the three-year period under review indicates that the impact of drought, veld fires and household climate severity index increased at the 1% level of significance.

The results in Column (IV) reveal that at the 1% level of significance, the severity of drought was 1.58% higher in female headed households as compared to male headed households, *ceteris paribus*. This result is similar to other findings in literature that female-headed households in Southern Africa are more affected by variation in rainfall than households with adults of both genders".

The results in Column (IV) and Column (V) of Table 29 also show that households headed by older persons, widow/widowers, divorced/separated and large size households were more likely to be severely affected by drought and to have a higher household climate severity

index as compared to their counterparts. Probit estimates of the year on year and general trends in the impact and severity of climate related shocks are shown in **Appendix 26** and those for the general trends are shown in **Appendix 27**.

Table 29. OLS estimates of year on year trends in the severity of climate related shocks

VARIABLES	Floods impact	Waterlogging impact	Hailstorm impact	Drought impact	Veld fires impact	Climate related shocks index [0 - 5]
	(I)	(II)	(III)	(IV)	(V)	(VI)
Survey year is 2019 [1 if Yes, 0 if No]	-0.0597	0.0158	-0.0152	0.200***	0.131**	0.242***
	(0.0394)	(0.0284)	(0.0412)	(0.00866)	(0.0559)	(0.00777)
Survey year is 2018 [1 if Yes, 0 if No]	-0.00307	0.0101	-0.108***	0.0417***	-0.0930*	0.0354***
	(0.0340)	(0.0134)	(0.0389)	(0.00954)	(0.0551)	(0.00827)
General trends	-0.0242	0.00909	-0.00897	0.113***	0.148***	0.124***
	(0.0182)	(0.0105)	(0.0207)	(0.00384)	(0.0226)	(0.00386)
Household head is female [1 if Yes, 0 if No]	0.00109	0.0160	0.0332	0.0158***	-0.0538**	0.00654
	(0.0277)	(0.0178)	(0.0339)	(0.00520)	(0.0265)	(0.00640)
Household head age [Years]	0.000335	-0.000469	-0.000956	-0.00112***	-0.00129	0.000124
	(0.000837)	(0.000429)	(0.00112)	(0.000188)	(0.000925)	(0.000219)
Married living together	0.0430	0.0211	0.0408	0.0361**	0.0815	0.0694***
	(0.0831)	(0.0490)	(0.0922)	(0.0174)	(0.0867)	(0.0194)
Married living apart	0.00964	0.0340	0.0349	-0.0106	0.0289	0.0310
	(0.0925)	(0.0525)	(0.105)	(0.0198)	(0.101)	(0.0216)
Divorced/separated	0.0541	0.0272	0.0897	0.0532***	0.131	0.0592***
	(0.0983)	(0.0560)	(0.110)	(0.0200)	(0.106)	(0.0229)
Widow/widower	0.0492	0.0234	0.0849	0.0532***	0.108	0.0900***
	(0.0877)	(0.0513)	(0.0989)	(0.0185)	(0.0940)	(0.0208)
Primary level	-0.0243	-0.00950	0.0149	-0.0504***	0.0430	-0.0176**
	(0.0341)	(0.0167)	(0.0485)	(0.00729)	(0.0408)	(0.00898)
ZJC	-0.00968	-0.0267	-0.0129	-0.0596***	0.0165	-0.0243**
	(0.0447)	(0.0219)	(0.0581)	(0.00983)	(0.0491)	(0.0118)
O' level	-0.00130	-0.0280	0.00610	-0.0830***	0.0708	-0.0619***
	(0.0409)	(0.0203)	(0.0561)	(0.00889)	(0.0460)	(0.0106)
A' level	0.0558	-0.0289	-0.170	-0.0366	0.00823	-0.118***
	(0.140)	(0.0712)	(0.163)	(0.0347)	(0.148)	(0.0342)
Diploma/Certificate after primary	-0.252	-0.141	0.0409	-0.181***	-0.0316	-0.224***

	(0.155)	(0.109)	(0.264)	(0.0598)	(0.214)	(0.0473)
Diploma/Certificate after secondary	0.224*	-0.108*	-0.0996	-0.193***	-0.0323	-0.203***
	(0.117)	(0.0632)	(0.214)	(0.0383)	(0.111)	(0.0303)
Graduate/Post-Graduate	0.113	-0.0721	-0.430***	-0.0569	-0.161	-0.154***
	(0.189)	(0.0972)	(0.0609)	(0.0465)	(0.141)	(0.0462)
Household size	0.00104	0.0124***	0.00404	0.00392***	-0.00965	0.0190***
	(0.00547)	(0.00263)	(0.00755)	(0.00124)	(0.00612)	(0.00149)
Household members with mental illness	-0.0316	0.0311**	-0.0111	0.00280	0.0328	0.00512
	(0.0233)	(0.0148)	(0.0331)	(0.00550)	(0.0238)	(0.00724)
Household members with chronic illness	0.0304	-0.0246	0.0102	0.0160**	-0.00367	0.0292***
	(0.0283)	(0.0162)	(0.0345)	(0.00641)	(0.0288)	(0.00837)
Mashonaland Central	-0.115*	-0.0300	0.124	-0.0111	-0.276***	0.0113
	(0.0666)	(0.0329)	(0.0833)	(0.0108)	(0.0818)	(0.0118)
Mashonaland East	-0.270***	-0.106***	0.0179	-0.0354***	-0.184**	0.0358***
	(0.0608)	(0.0269)	(0.0667)	(0.0109)	(0.0809)	(0.0118)
Mashonaland West	-0.159***	-0.0702**	-0.0174	-0.0731***	-0.145*	0.00349
	(0.0615)	(0.0289)	(0.0651)	(0.0119)	(0.0783)	(0.0128)
Matabeleland North	-0.153***	0.0153	-0.0907	-0.00934	-0.224***	0.173***
	(0.0535)	(0.0272)	(0.0671)	(0.0107)	(0.0869)	(0.0130)
Matabeleland South	-0.185***	-0.0376	-0.0468	-0.0312***	0.0358	0.157***
	(0.0503)	(0.0285)	(0.0659)	(0.0109)	(0.0869)	(0.0130)
Midlands	-0.261***	0.0350	-0.0523	-0.0198*	-0.0972	0.166***
	(0.0497)	(0.0257)	(0.0742)	(0.0107)	(0.0834)	(0.0128)
Masvingo	-0.196***	-0.0448*	0.0316	-0.0497***	0.0500	0.104***
	(0.0466)	(0.0261)	(0.0686)	(0.0117)	(0.103)	(0.0132)
Constant	0.699***	0.555***	0.457***	0.752***	0.622***	0.273***
	(0.107)	(0.0595)	(0.130)	(0.0228)	(0.130)	(0.0246)
Observations	1,702	6,989	1,037	22,277	1,503	40,296
R-squared	0.031	0.016	0.031	0.058	0.085	0.054

Robust standard errors in parentheses - *** p<0.01, ** p<0.05, * p<0.1

6.7 Human and Wildlife Conflict

6.7.1 Descriptive analysis of the incidences of human and wildlife conflict shocks

The results presented in Table 30 show a significant increase in human-wildlife conflict between 2017 and 2018 and then a decrease between 2018 and 2019. The increase and decrease in the human-wildlife conflict during the period under review was statistically valid with a 99% level of confidence.

Table 30. Descriptive analysis of the incidences of human and wildlife conflict shocks

Year	Mean	S. D
2017	0.048	0.215
2018	0.107	0.309
2019	0.097	0.296
P - value	0.000	

6.7.2 Inferential analysis of year on year and the general trends in the incidences of human and wildlife conflict

The results of the inferential analysis presented in Table 31 show that at the 1% level of significance, the incidences of human-wildlife conflict increased both on year to year basis and overall for the period under review. Furthermore, the results show that at the 1% level of significance, the incidence of human-wildlife conflict was likely to be 0.2% and 1.34% higher in large size households and households with chronically ill members, respectively.

Table 31. OLS and Probit estimates of year on year and general trends in the incidences of human and wildlife conflict

VARIABLES	OLS	Probit
	(I)	(II)
Survey year is 2019 [1 if Yes, 0 if No]	0.0486***	0.373***
	(0.00327)	(0.0261)
Survey year is 2018 [1 if Yes, 0 if No]	0.0601***	0.438***
	(0.00334)	(0.0258)
General trend	0.0224***	0.153***
	(0.00166)	(0.0113)
Household head is female [1 if Yes, 0 if No]	-0.00459	-0.0324*
	(0.00306)	(0.0197)
Household head age [Years]	2.64e-05	0.000192
	(0.000102)	(0.000650)
Married living together	0.00939	0.0623
	(0.00946)	(0.0576)
Married living apart	0.00153	0.0113
	(0.0105)	(0.0649)

Divorced/separated	-0.0201*	-0.153**
	(0.0106)	(0.0712)
Widow/widower	-0.00823	-0.0512
	(0.0101)	(0.0623)
Primary level	0.00524	0.0326
	(0.00418)	(0.0270)
ZJC	0.00665	0.0421
	(0.00549)	(0.0354)
O' level	-0.00372	-0.0229
	(0.00483)	(0.0321)
A' level	-0.0230*	-0.183
	(0.0137)	(0.120)
Diploma/Certificate after primary	-0.000154	-0.00683
	(0.0225)	(0.156)
Diploma/Certificate after secondary	-0.0111	-0.0779
	(0.0139)	(0.101)
Graduate/Post-Graduate	-2.48e-05	-0.00835
	(0.0216)	(0.141)
Household size	0.00200***	0.0125***
	(0.000681)	(0.00416)
Household members with mental illness	0.00615*	0.0349*
	(0.00365)	(0.0204)
Household members with chronic illness	0.0134***	0.0802***
	(0.00441)	(0.0233)
Mashonaland Central	0.0411***	0.347***
	(0.00486)	(0.0430)
Mashonaland East	-0.00107	-0.0296
	(0.00389)	(0.0461)
Mashonaland West	0.0552***	0.434***
	(0.00529)	(0.0433)
Matabeleland North	0.0745***	0.551***
	(0.00561)	(0.0427)
Matabeleland South	0.105***	0.693***
	(0.00598)	(0.0420)
Midlands	0.0463***	0.379***
	(0.00493)	(0.0426)
Masvingo	0.0686***	0.512***
	(0.00543)	(0.0426)
Constant	-0.0158	-2.170***
	(0.0113)	(0.0784)
Observations	39,222	39,222
R-squared	0.025	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.7.3 Descriptive analysis of the severity of human and wildlife conflict shocks

Table 32 shows the severity of human and wildlife conflict during the three-years under review. The results indicate that at 99% level of confidence, the increase in human and wildlife conflict was not significant before controlling for observed confounders.

Table 32. Descriptive analysis in the severity of human and wildlife conflict shocks

Year	Shock	Mean	S. D
2017	Human wildlife conflict	0.575	0.495
2018	Human wildlife conflict	0.586	0.493
2019	Human wildlife conflict	0.654	0.476
	P - value	0.335	

6.7.4 Inferential analysis of year on year and the general trends in the severity of human and wildlife conflict

The results of inferential analysis presented in Table 33 reveal that at the 1% level of significance, the severity of human and wildlife conflict increased by 9.72% between 2018 and 2019. The general trend for the period under review, shows a significant increase in the severity of human and wildlife conflict at the 99% level of confidence. Furthermore, the results in Table 33 review that at the 1% level of significance, the severity of human and wildlife conflict was likely to be 12.3% and 11.2% more in Matabeleland North and Matabeleland South, respectively, *ceteris paribus*, as compared to the base province of Manicaland.

Table 33. OLS and Probit estimates of year on year trends in the severity of human and wildlife conflict

VARIABLES	OLS	Probit
	(I)	(II)
Survey year is 2019 [1 if Yes, 0 if No]	0.0972***	0.259***
	(0.0271)	(0.0708)
Survey year is 2018 [1 if Yes, 0 if No]	0.0135	0.0367
	(0.0262)	(0.0674)
General trend	0.0563***	0.149***
	(0.0128)	(0.0337)
Household head is female [1 if Yes, 0 if No]	-0.00512	-0.0146
	(0.0174)	(0.0464)
Household head age [Years]	-0.000251	-0.000628
	(0.000592)	(0.00156)
Married living together	-0.000231	0.00199
	(0.0516)	(0.137)
Married living apart	-0.00761	-0.0182

	(0.0584)	(0.155)
Divorced/separated	0.00210	0.00624
	(0.0663)	(0.176)
Widow/widower	0.0100	0.0295
	(0.0558)	(0.149)
Primary level	-0.00377	-0.0106
	(0.0241)	(0.0639)
ZJC	-0.0398	-0.104
	(0.0315)	(0.0824)
O' level	-0.00548	-0.0136
	(0.0288)	(0.0760)
A' level	-0.162	-0.413
	(0.126)	(0.315)
Diploma/Certificate after primary	0.0583	0.179
	(0.125)	(0.362)
Diploma/Certificate after secondary	-0.0319	-0.0814
	(0.0944)	(0.244)
Graduate/Post-Graduate	-0.0923	-0.240
	(0.132)	(0.332)
Household size	0.000560	0.00143
	(0.00391)	(0.0104)
Household members with mental illness	-0.00320	-0.00908
	(0.0174)	(0.0466)
Household members with chronic illness	0.0294	0.0806
	(0.0188)	(0.0522)
Mashonaland Central	0.0490	0.125
	(0.0448)	(0.114)
Mashonaland East	0.00549	0.0154
	(0.0508)	(0.128)
Mashonaland West	0.0400	0.106
	(0.0444)	(0.114)
Matabeleland North	0.123***	0.325***
	(0.0432)	(0.111)
Matabeleland South	0.112***	0.294***
	(0.0421)	(0.109)
Midlands	0.00164	0.00212
	(0.0446)	(0.113)
Masvingo	0.0828*	0.215*
	(0.0437)	(0.112)
Constant	0.519***	0.0380
	(0.0747)	(0.196)
Observations	3,419	3,419
R-squared	0.016	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Chapter Summary

Economic related stressors

- The results show that cash shortage was the most experienced economic stressor throughout the three years under review and the incidence of this stress was increasing at an alarming rate from 46.9%s in 2017 to 81.6% in 2019.
- Inferential analysis results reveal that at the 1% level of significance, an increase in the age of household head by one year decreased the propensity of the household to be affected by cereal price change (0.001 points) and by loss of employment (0.002 points).
- Increasing household size by one member increased the propensity of the household to be affected by all the economic stressors except for loss of employment.
- Households with chronically ill members had an increased likelihood to be affected by all the economic stressors as compared to households without chronically ill members, *ceteris paribus*.
- At the 1% significance level, an increase in the age of the household head by one year was likely to decrease the severity of the following economic stressors; cereal price change (0.06%), cash shortage (0.06%), loss of employment (0.28%) and Economic stressors index by (0.001 points).

Social related stressors

- There was an increase in the incidence of social conflict from 2.4% in 2017 to 4.2% in 2018 and a decrease from 4.2% in 2018 to 2.2% in 2019.
- Increasing the age of household head by one year was likely to decrease the incidence of social conflict by 0.53%.
- At the 1% level of significance, female headed households were 0.53% more likely to experience social conflict as compared to male headed households.

Incidence of crop and livestock diseases

- There was a significant increase in the incidence of livestock diseases from 9.3% in 2017 to 24.7% in 2019, livestock deaths increased from 8.6% to 23.5%, crop pests increased from 29.9% to 44.1% and crop and livestock shock increased from 44.6% in 2017 to 91.8% in 2019.
- At the 1% level of significance, an increase in household size by one member was likely to increase the incidence of crop and livestock diseases.

- At the 1% level of significance, an increase in the age of household head by one year and decreased the severity of crop pests by 0.13%.
- At the 1% level of significance, except for Matabeleland South, households in all the other provinces were likely to experience an increase in livestock and crop shock than the base province of Manicaland.

Health related shocks

- The results reveal a significant increase, at the 99% confidence level, in all health-related shocks from 2017 to 2018 and then a significant decrease from 2018 to 2019.
- Households headed by older persons were likely to experience reduced incidences of diarrheal diseases by 0.09%, reduced incidences of malaria disease by 0.01% and likely to experience an increase in health-related shocks by 0.21%.
- Increasing household size by one member increased the propensity for the incidence of HIV/AIDS by 0.2%, diarrheal diseases by 0.14% and health related morbidity by 0.37%.
- The results reveal that at the 1% level of significance, the impact of the death of the breadwinner increased by 16.8% between 2017 and 2018 and by 21.2% points between 2017 and 2019.

Climate related shocks

- In 2017, 32.4% of the sampled households experienced drought and the number increased to 76.1% in 2019.
- The results reveal a decrease in climate related shock index from 0.831 in 2017 to 0.801 in 2018 and then an increase to 0.876 points in 2019. The difference was significant at the 99% confidence level.
- There was a decrease in the incidence of floods, waterlogging and hailstorm during the period 2018 to 2019, while the incidence for drought, veld fires and household climate increased during the same period, 2018 and 2019.
- The incidence of drought was likely to increase in all provinces except for Mashonaland West as compared to the base province of Manicaland, *ceteris paribus*.
- There was an increase in the severity of drought at the 99% level of confidence from 68.3% in 2017 to 88.4% in 2019.
- The results indicate an increase in climate related shocks index from 0.498 in 2017 to 0.738.

- At the 99% level of confidence, the results indicate an increase in the climate related shocks index from 0.498 in 2017 to 0.738 in 2019.

Human and Wildlife Conflict

- There was a significant increase in human-wildlife conflict between 2017 and 2018 and then a decrease between 2018 and 2019.
- The results show that at the 1% level of significance, the incidence of human-wildlife conflict was likely to be 0.2% and 1.34% higher in large size households and households with chronically ill members, respectively.
- More so, the severity of human and wildlife conflict was likely to be 12.3% and 11.2% more in Matabeleland North and Matabeleland South, respectively, as compared to the base province of Manicaland.

CHAPTER 7

Household resilience capacities

7.1 Introduction

Resilience is defined from a social-ecological perspective as the capacity of socioeconomic systems (e.g., households) to withstand shocks through absorption, adaptation and transformation. Resilience has been applied in various contexts to understand whether and how social and economic systems could become more robust to shocks. According to Béné et al. (2012), resilience is understood as capacity with three key attributes which characterize the set of necessary actions that any system exposed to shocks needs to undertake. The actions include: what needs to be done to help the system absorb a shock when it occurs; what needs to be done to help the system adapt in a way that makes it less exposed to the shock; and what needs to be done for the system to transform so that it is no longer prone to similar shocks. These three attributes correspond to absorptive capacity, adaptive capacity and transformative capacity.

7.2 Absorptive capacity

Absorptive capacity defines the ability of a system to minimize its exposure to shocks, but also having the mechanisms to recover quickly when shocks actualize. This capacity ensures the persistence of system functions, and mostly constitute coping strategies such as harvesting crops early to avoid floods.

7.2.1 Descriptive analysis of absorptive capacity

Table 34 shows an increase in absorptive resilience from 29.2 points in 2017 to 31.3 points in 2018 and then a decrease to 30.9 points in 2019. The increase and decrease in the adsorptive capacities were significant at the 99% level of confidence.

Table 34. Descriptive analysis of absorptive resilience

Year	Mean	S. D
2017	29.248	24.255
2018	31.390	24.652
2019	30.936	23.907
P - value	0.000	

7.2.2 Inferential analysis of general trends in absorptive capacity

Table 35 show inferential analysis results for the trends in absorptive capacity during the three years under review. The results reveal that at the 1% level of significance the absorptive capacity increased by 1.69 points between 2017 and 2018 and increased by 1.627

points between 2017 and 2019. The general trend also indicates that increasing the survey year by one year is associated with an increase in the household absorptive capacity by 0.759 points other things being equal.

In addition, the results show that at the 1% level of significance, increasing the age of household head by one year was more likely to increase the absorptive capacity by 0.122 points and by 0.894 for households with chronically ill members. Except for married couples living separately, all other forms of marital status were likely to reduce the household absorptive capacity. Similarly, increasing household size by one-member increased the propensity to have a reduced absorptive capacity as compared to small size households. The results in **Table 35** also reveal that at the 1% level of significance, households headed by educated persons were more likely to have a higher absorptive capacity as compared to households headed by less educated persons, *ceteris paribus*. Furthermore, at the 1% level of significance, households in Matabeleland North and Mashonaland West were most likely to have a lower absorptive capacity as compared to the base province of Manicaland

Table 35. OLS estimates of trends in household absorptive capacity

VARIABLES	OLS (I)
Survey year is 2019 [1 if Yes, 0 if No]	1.627***
	(0.319)
Survey year is 2018 [1 if Yes, 0 if No]	1.690***
	(0.316)
General trend	0.759***
	(0.159)
Household head is female [1 if Yes, 0 if No]	0.377
	(0.262)
Household head age [Years]	0.122***
	(0.00896)
Married living together	-6.457***
	(0.814)
Married living apart	1.133
	(0.921)
Divorced/separated	-4.043***
	(0.964)
Widow/widower	-2.797***
	(0.879)
Primary level	2.789***
	(0.370)
ZJC	4.053***
	(0.478)
O' level	4.935***
	(0.421)
A' level	6.901***

	(1.367)
Diploma/Certificate after primary	4.951***
	(1.836)
Diploma/Certificate after secondary	6.854***
	(1.182)
Graduate/Post-Graduate	7.878***
	(1.431)
Household size	-0.722***
	(0.0587)
Household members with mental illness	-0.243
	(0.289)
Household members with chronic illness	0.894***
	(0.346)
Mashonaland Central	-0.600
	(0.491)
Mashonaland East	1.944***
	(0.468)
Mashonaland West	-2.028***
	(0.504)
Matabeleland North	-1.452***
	(0.507)
Matabeleland South	1.334***
	(0.512)
Midlands	1.022**
	(0.502)
Masvingo	1.694***
	(0.517)
Constant	28.11***
	(1.030)
Observations	38,692
R-squared	0.029

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

7.3 Adaptive capacity

Adaptive capacity measures *the ability to make informed choices about alternative livelihood strategies based on changing conditions*. Diversification of livelihood activities, use of drought resistant crop varieties, among others are some key adaptive strategies that help households to deal with shocks.

7.3.1 Descriptive analysis of adaptive capacity

The results presented in Table 36 show an increase in adaptive capacity between 2017 and 2019 and then a decrease between 2018 and 2019. The increase and decrease in the adaptive capacities were statistically valid with a 99% level of confidence.

Table 36. Descriptive analysis of adaptive capacity

Year	Mean	S. D
2017	8.051	5.851
2018	8.499	5.912
2019	8.464	5.829
P - value	0.000	

7.3.2 Inferential analysis for the trends in adaptive capacity

The results presented in **Table 37** show positive year on year and general trends in the household adaptive capacities at the 1% level of significance. Furthermore, female headed households were more likely to have a reduced adaptive capacity as compared to male headed households. More so, at the 1% level of significance, the results indicate that increasing the age of household head by one year and increasing family size by one member increased the likelihood of the household to have an increased adaptive capacity, *ceteris paribus*. The results also show that at the 1% level of significance, increasing the educational level of household head increased household adaptive capacity. At the 1% level of significance, households in Mashonaland Central, Mashonaland West, Mashonaland North, Matabeleland South, Midlands and Masvingo provinces were likely to have a lower adaptive capacity than those in the base province of Manicaland.

Table 37. OLS estimates of trends in household adaptive capacity

VARIABLES	OLS (I)
Survey year is 2019 [1 if Yes, 0 if No]	0.423*** (0.0620)
Survey year is 2018 [1 if Yes, 0 if No]	0.702*** (0.0618)
General trend	0.193*** (0.0310)
Household head is female [1 if Yes, 0 if No]	-0.143*** (0.0523)
Household head age [Years]	0.0114*** (0.00168)
Married living together	0.589*** (0.140)
Married living apart	-0.431*** (0.155)
Divorced/separated	0.0998 (0.164)
Widow/widower	0.675*** (0.154)
Primary level	1.023***

	(0.0695)
ZJC	5.778***
	(0.0954)
O' level	6.530***
	(0.0818)
A' level	6.849***
	(0.278)
Diploma/Certificate after primary	8.319***
	(0.588)
Diploma/Certificate after secondary	7.647***
	(0.245)
Graduate/Post-Graduate	8.893***
	(0.399)
Household size	0.737***
	(0.0136)
Household members with mental illness	-0.223***
	(0.0580)
Household members with chronic illness	0.0757
	(0.0711)
Mashonaland Central	-0.292***
	(0.0976)
Mashonaland East	-0.219**
	(0.0972)
Mashonaland West	-0.372***
	(0.101)
Matabeleland North	-1.507***
	(0.101)
Matabeleland South	-1.377***
	(0.103)
Midlands	-0.462***
	(0.1000)
Masvingo	-0.468***
	(0.102)
Constant	1.012***
	(0.185)
Observations	40,296
R-squared	0.313

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

7.4 Transformative capacity

Transformative capacity refers to the system level conditions that are necessary for changing the basic configuration of the system to create long-term resilience. Adaptive and transformative capacities are necessary for dealing with the primary sources of vulnerability and they involve medium to long-term mechanisms that help vulnerable systems to develop robustness against specific kinds of shocks.

7.4.1 Descriptive analysis of transformative capacity

The descriptive results for transformative capacity displayed in Table 38 reveal a sharp decrease in transformative capacity from 23.6 in 2017 to 8.48 in 2018 and then an increase to 14.1 in 2019. The increase and decrease in the transformative capacities were statistically valid with a 99% level of confidence.

Table 38. Descriptive analysis of transformative capacity

Year	Mean	S. D
2017	23.617	42.475
2018	8.484	27.865
2019	14.110	34.813
P - value	0.000	

7.4.2 Inferential analysis in the trends in transformative capacity

Table 39 point to declining year on year and general trends in the household transformative capacities at the 1% level of significance after controlling for observed confounding variables. Furthermore, at the 1% level of significance, increasing the age of the household head by one year increased household transformative capacity by 0.149 points. More so, the results in Table 39 show that large size households and those with chronically ill persons and members with mental illness had a higher transformative capacity.

Table 39. OLS estimates of trends in household transformative capacity

VARIABLES	OLS (I)
Survey year is 2019 [1 if Yes, 0 if No]	-9.076***
	(0.497)
Survey year is 2018 [1 if Yes, 0 if No]	-14.93***
	(0.458)
General trends	-4.151***
	(0.248)
Household head is female [1 if Yes, 0 if No]	-0.104
	(0.371)
Household head age [Years]	0.149***
	(0.0127)
Married living together	-3.263***
	(1.091)
Married living apart	-3.755***
	(1.211)
Divorced/separated	-1.964
	(1.292)
Widow/widower	-0.734
	(1.198)
Primary level	-2.341***

	(0.546)
ZJC	-1.553**
	(0.674)
O' level	-2.042***
	(0.599)
A' level	-4.097**
	(1.715)
Diploma/Certificate after primary	-4.873*
	(2.842)
Diploma/Certificate after secondary	-5.408***
	(1.559)
Graduate/Post-Graduate	-6.558***
	(2.076)
Household size	0.475***
	(0.0877)
Household members with mental illness	1.997***
	(0.430)
Household members with chronic illness	1.978***
	(0.497)
Mashonaland Central	0.131
	(0.640)
Mashonaland East	-2.658***
	(0.597)
Mashonaland West	-2.669***
	(0.630)
Matabeleland North	7.294***
	(0.749)
Matabeleland South	11.02***
	(0.773)
Midlands	3.323***
	(0.683)
Masvingo	7.270***
	(0.740)
year	
Constant	14.94***
	(1.404)
Observations	40,296
R-squared	0.064

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Chapter Summary

Absorptive capacity

- The results reveal that at the 1% level of significance, the absorptive capacity increased by 1.69 points between 2017 and 2018 and decreased by 1.627 points between 2018 and 2019.
- Increasing the age of household head by one year was more likely to increase household absorptive capacity by 0.122 points and by 0.894 for households with chronically ill members.
- Increasing household size by one-member increased household propensity to have a reduced absorptive capacity as compared to small size households.
- Households headed by educated persons were more likely to have a higher absorptive capacity as compared to households headed by less educated persons, *ceteris paribus*.
- Households in Matabeleland North and Mashonaland West were most likely to have a lower absorptive capacity as compared to the base province of Manicaland.

Adaptive capacity

- The results show an increase in adaptive capacity between 2017 and 2019 and then a decrease between 2018 and 2019.
- Female headed households were more likely to have a reduced adaptive capacity as compared to male headed households.
- At the 1% level of significance, increasing the age of household head by one year and increasing family size by one member increased the likelihood of the household to have an increased adaptive capacity, ceteris paribus.
- At the 1% level of significance, increasing the educational level of household head was likely to increase household adaptive capacity.
- Households in Mashonaland Central, Mashonaland West, Matabeleland North, Matabeleland South, Midlands and Masvingo provinces are likely to have a lower adaptive capacity than those in the base province of Manicaland.

Transformative capacity

- The results reveal a significant decrease in transformative capacity from 23.6 in 2017 to 8.48 in 2018 and then an increase to 14.1 in 2019.
- At the 1% level of significance, increasing the age of household head increased household transformative capacity by 14.9%.
  Large size households and those with chronically or mentally ill members had a higher adaptive capacity.

CHAPTER 8

Resilience and Food and Nutrition Security in The Face of Livelihood Shocks

8.1 Introduction

Available evidence indicates a positive and statistically significant relationship between food consumption, food expenditure or dietary diversity and household resilience. Alinovi et al. (2010) find that a unit increase in the level of resilience is associated with a statistically significant increase of 0.38% in the level of food consumption, controlling for location, gender and household size. Ciani and Romano (2013) interpret this to mean that households with higher initial levels of resilience experience better levels of food security in future when challenged by eventualities. Alfani et al. (2015) find that resilient households often have higher and stable consumption than the non-resilient and chronically poor. d'Errico et al. (2018) find that households with higher resilience capacities in an initial period are less likely to suffer a reduction in per capita calorie intake in a future period even when shocks hit them. Resilience capacity is developed or achieved through the primary causal pathways.

Policy interventions and programmes that target livelihood or welfare outcomes could influence the resilience building strategies, hence resilience capacity (Vaitla et al. 2012; Béné et al. 2017). The economic, legal and political settings within which a household operates could influence the resilience-building strategies. According to Nyahunda & Tirivangasi (2019), the vulnerability of rural households to shocks may be linked closely to socio-economic conditions, which correlate with the people's adaptive capacity. More so, adaptive capacity among rural people is typically limited by poverty, poor public and environmental health, weak institutions, lack of infrastructure and services, marginalisation from decision-making processes and planning procedures, gender inequality, lack of education and information, natural disasters, environmental degradation, reliance on rain-fed agriculture and climate-sensitive resources, and insecure tenure.

8.2 The impact of absorptive capacities on food and nutrition security

8.2.1 Cereal price change shock

Table 40 show the treatment effect of absorptive resilience capacities on food and nutrition security in the face of cereal price change shock. The results reveal that at the 1% level of significance, household absorptive capacity was associated with a decline in the household probability of being in hunger, *ceteris paribus*. For example, Column (I) shows that for the full sample absorptive capacities reduced the probability for a household being in hunger by 0.122 points, increased the probability of the household having an acceptable food consumption score by 14.1% and reduced the probability of it having an unacceptable dietary diversity score by 9.54% at the 1% level of significance. Columns (II) and (III) shows that the impact of resilience on household food and nutrition security was similar for both shock affected and non-shock affected households.

Table 40. Treatment effect of absorptive capacity on food and nutrition security under cereal price change shock

VARIABLES	Full sample	Household is affected by cereal price change shock	Household is not affected by cereal price change shock
	(I)	(II)	(III)
Household Hunger Scale	-0.122***	-0.117***	-0.115***
	(0.00888)	(0.0138)	(0.0113)
Acceptable FCS	0.141***	0.146***	0.150***
	(0.00645)	(0.00930)	(0.00904)
Unacceptable DDS	-0.0954***	-0.0896***	-0.105***
	(0.00495)	(0.00751)	(0.00684)
Observations	40,296	18,820	20,433

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

8.2.2 Social conflict shock

Table 41 shows the treatment effect of absorptive resilience capacities on food and nutrition security under social conflict shock. Overall, the results in Table 41 show a positive impact of household absorptive capacities on household food security as in all the cases, the absorptive capacities promote the outcome variables. Column (I) of Table 41 indicates that at the 1% level of significance, household absorptive capacity was associated with a decline in the probability of the household being in hunger, *ceteris paribus*. For households affected by the social conflict shock, Column (I) shows that absorptive capacity was likely to reduce the probability of affected households being in hunger by 0.164 points and by 0.13 points (Column II) for those not affected by the social conflict shock at the 1% level of significance, *ceteris paribus*. In addition, the results reveal that at the 1% level of

significance, absorptive capacity was associated with an increase in the propensity of the affected households achieving an acceptable food consumption score (FCS) by 0.08 points. Similarly, household absorptive capacity was associated with an increase in the propensity for unaffected households achieving an acceptable food consumption FCS by 0.162 points. As for dietary diversity, Table 41 shows that at the 1% level of significance, absorptive capacity was associated with a decline in unacceptable dietary diversity by 0.08 points for households affected by social conflict shock (Column I) and by 0.106 points for unaffected households (Column II), *ceteris paribus*.

Table 41. Treatment effect of absorptive capacity on food and nutrition security under social conflict shock

VARIABLES	Household is affected by social conflict (I)	Household is not affected by social conflict (II)
Household Hunger Scale	-0.164***	-0.130***
	(0.0573)	(0.00899)
Acceptable FCS	0.0802**	0.162***
	(0.0345)	(0.00652)
Unacceptable HDDS	-0.0816***	-0.106***
	(0.0282)	(0.00517)
Observations	1,164	38,516

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.2.3 Livestock diseases shock

Table 42 shows the treatment effect of absorptive resilience capacities on food and nutrition security under livestock disease shock. Overall, the results reveal a positive impact of household absorptive capacities on household food security for both households affected by the livestock diseases shock and those not affected as in all the cases, the absorptive capacities promoted the outcome variables. Table 42 indicates that at the 1% level of significance, household absorptive capacity is associated with a decline in the probability of the household being in hunger, *ceteris paribus*. Column (I) shows that household absorptive capacity reduced the likelihood of affected households being in hunger by 0.12 points and by 0.134 points (Column II) for those not affected by the livestock disease shock at the 1% level of significance, *ceteris paribus*. Furthermore, the results reveal that at the 1% level of significance, absorptive capacity was associated with an increase in the propensity of the affected households achieving an acceptable FCS by 0.152 points (Column

(I) and by 0.162 points for unaffected households. In addition, Table 42 shows that at the 1% level of significance, absorptive capacity was associated with a decline in unacceptable dietary diversity by 0.093 points for households affected by the livestock disease shock (Column I) and by 0.108 points for unaffected households (Column II), *ceteris paribus*.

Table 42. Treatment effect of absorptive capacity on food and nutrition security under livestock disease shock

VARIABLES	Household is affected by livestock diseases (I)	Household is not affected by livestock diseases (II)
Household Hunger Scale	-0.120***	-0.134***
	(0.0216)	(0.00997)
Acceptable FCS	0.152***	0.162***
	(0.0156)	(0.00703)
Unacceptable DDS	-0.0937***	-0.108***
	(0.0114)	(0.00564)
Observations	7,249	32,576

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.2.4 Health-related shocks – HIV/AIDS

Table 43 shows the treatment effect of absorptive resilience capacities on food and nutrition security under HIV/AIDS shock. Similar to the impact of absorptive capacity on food and nutrition security under cereal price change (Table 40), social conflict (Table 41) and livestock diseases (Table 42), the results in Table 43 reveal a positive impact of household absorptive capacities on household food security for both households affected by the HIV/AIDS shock and those not affected as in all the cases, the absorptive capacities promoted the outcome variables. At the 1% level of significance, household absorptive capacity was associated with a decline in the probability of both HIV/AIDS affected and unaffected households being in hunger and also associated with a decline in the probability of not achieving an unacceptable dietary diversity, *ceteris paribus*. Furthermore, the results reveal that at the 1% level of significance, absorptive capacity was associated with an increase in the propensity of both HIV/AIDS affected and unaffected households achieving an acceptable FCS, *ceteris paribus*. These findings corroborate findings from other studies in literature.

Table 43. Treatment effect of absorptive capacity on food and nutrition security under the HIV/AIDS shock

VARIABLES	Household is affected by HIV/AIDS (I)	Household is not affected by HIV/AIDS (II)
Household Hunger Scale	-0.168***	-0.137***
	(0.0357)	(0.00911)
Acceptable FCS	0.172***	0.155***
	(0.0209)	(0.00679)
Unacceptable DDS	-0.0708***	-0.104***
	(0.0166)	(0.00525)
Observations	3,324	36,337

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.2.5 Climate related shocks - drought

Table 44 shows the treatment effect of absorptive resilience capacities on food and nutrition security under HIV/AIDS shock. The results reveal a positive impact of household absorptive capacities on household food security for both households affected and unaffected by drought shock. *Ceteris paribus*, at the 1% level of significance, household absorptive capacity was associated with 0.134 points and 0.133 points decline in the probability of drought affected (Column I) and unaffected (Column II) households being in hunger, respectively. More so, drought affected households were associated with 0.109 points decline in the probability of having an unacceptable dietary diversity and those not affected by drought were similarly impacted with a 0.101 points probability decline. Furthermore, the results reveal that at the 1% level of significance, absorptive capacity was *ceteris paribus* associated with an increase in the propensity of both drought affected and unaffected households achieving an acceptable FCS by 0.139 and 0.166 points, respectively.

Table 44. Treatment effect of absorptive capacity on food and nutrition security under the drought shock

VARIABLES	Household is affected by drought (I)	Household is not affected by drought (II)
Household Hunger Scale	-0.134***	-0.133***
	(0.0122)	(0.0126)
Acceptable FCS	0.139***	0.166***
	(0.00839)	(0.00978)
Unacceptable DDS	-0.109***	-0.101***
	(0.00695)	(0.00731)
Observations	22,598	17,382

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.2.6 Human- wildlife conflict shock

Table 45 shows the treatment effect of absorptive resilience capacities on food and nutrition security under human-wildlife shock. The results reveal that at the 1% level of significance, household absorptive capacity was associated with a decline in the probability of both affected and unaffected households being in hunger and also associated with a decline in the probability of the households having an unacceptable dietary diversity, *ceteris paribus*. For example, Column (I) of Table 45 shows that at the 1% level of significance, the probability of the households affected by the human-wildlife conflict to be in hunger was reduced by 0.155 points and by 0.121 points for unaffected households, *ceteris paribus*. Overall, the results reveal a positive impact of household absorptive capacities on household food security for both households affected by human-wildlife conflict shock and those not affected as in all the cases, the absorptive capacities promoted the outcome variables, that is reduced food and nutrition insecurity.

Table 45. Treatment effect of absorptive capacity on food and nutrition security under human and wildlife shock

VARIABLES	Household is affected by human-wildlife conflict (I)	Household is not affected by human-wildlife conflict (II)
Household Hunger Scale	-0.155***	-0.121***
	(0.0318)	(0.00916)
Acceptable FCS	0.130***	0.156***
	(0.0221)	(0.00673)
Unacceptable DDS	-0.110***	-0.104***
	(0.0177)	(0.00520)
Observations	3,476	36,270

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

8.3 The impact of adaptive capacities on food and nutrition security

8.3.1 Cereal price change shock

Table 46 shows the treatment effect of adaptive resilience capacities on food and nutrition security in the face of cereal price change shock. Overall, the results in Table 46 show a positive impact of household absorptive capacities on household food security as in all the cases, the adaptive capacities promoted household food and nutrition security. The results reveal that at the 5% level of significance, household adaptive capacity was associated with a decline in the probability of households being in hunger in the three-year period under review, *ceteris paribus*. Column (I) shows that for the full sample household adaptive capacities reduced the probability of sampled households being in hunger by 0.023 points, increased the probability of the household having an acceptable FCS by 10.3% and reduced the probability of the household having an unacceptable HDDS by 6.35% at the 1% level of significance. The results in Columns (II) and (III) show positive impact of adaptive capacities

on food and nutrition security proxies for both shock affected and non-shock affected households.

Table 46. Treatment effect of adaptive capacity on food and nutrition security under cereal price change shock

VARIABLES	Full sample	Household is affected by cereal price change shock	Household is not affected by cereal price change shock
	(I)	(II)	(III)
Household Hunger Scale	-0.0234**	-0.0397**	-0.0186
	(0.0111)	(0.0171)	(0.0140)
Acceptable FCS	0.103***	0.0720***	0.110***
	(0.00938)	(0.0149)	(0.0139)
Unacceptable HDDS	-0.0635***	-0.0580***	-0.0584***
	(0.00655)	(0.0109)	(0.00867)
Observations	40,296	18,820	20,433

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.3.2 Social conflict shock

Table 47 shows the treatment effect of adaptive resilience capacities on food and nutrition security under social conflict shock. Overall, the results in Table 47 show a positive impact of household adaptive capacity on household food security as in all the cases, the adaptive capacities reduced household food and nutrition insecurity. For households affected by social conflict, Column (I) shows that adaptive capacity was likely to reduce the probability of affected households being in hunger by 0.14 points (Column I) at the 5% level of significance and by 0.073 points (Column II) for those not affected by the social conflict at the 1% level of significance, *ceteris paribus*. Furthermore, the results reveal that at the 1% level of significance, adaptive capacity was associated with an increase in the propensity of the affected households achieving an acceptable food consumption score (FCS) by 0.12 points and by 0.139 points for unaffected households. The results further reveal that at the 1% level of significance, adaptive capacity was associated with a decline in the probability of having an unacceptable HDDS by 0.111 points for households affected by social conflict (Column I) and by 0.098 points for unaffected households (Column II), *ceteris paribus*.

Table 47. Treatment effect of adaptive capacity on food and nutrition security under social conflict shock

VARIABLES	Household is affected by	Household is not affected

	social conflict (I)	by social conflict (II)
Household Hunger Scale	-0.140**	-0.0725***
	(0.0598)	(0.00890)
Acceptable FCS	0.120***	0.139***
	(0.0400)	(0.00672)
Unacceptable HDDS	-0.111***	-0.0983***
	(0.0323)	(0.00519)
Observations	1,164	38,516

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.3.3 Livestock diseases

Table 48 shows the treatment effect of adaptive resilience capacities on food and nutrition security in the face of livestock disease shock. Overall, the results reveal a positive impact of household absorptive capacities on household food security for both households affected by the livestock disease shock and those not affected, as in all the cases, the adaptive capacities reduced food insecurity. Column (I) of Table 48 indicates that at the 1% level of significance, household adaptive capacity was associated with a decline in the probability of the household being in hunger for both affected and unaffected households, *ceteris paribus*. Similarly, at the 1% level of significance, adaptive capacity was associated with a decline in the probability of the having an unacceptable HDDS for both affected and unaffected households, *ceteris paribus*. In addition, Table 48 shows that adaptive capacity increased the propensity of both affected and unaffected households achieving an acceptable FCS.

Table 48. Treatment effect of adaptive capacity on food and nutrition security under livestock disease shock

VARIABLES	Household is affected by livestock diseases (I)	Household is not affected by livestock diseases (II)
Household Hunger Scale	-0.0802***	-0.0723***
	(0.0232)	(0.00967)
Acceptable FCS	0.119***	0.143***
	(0.0164)	(0.00714)
Unacceptable HDDS	-0.0716***	-0.0993***
	(0.0120)	(0.00573)
Observations	7,249	32,576

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.3.4 Health related - HIV/AIDS

Table 49 shows the treatment effect of adaptive resilience capacities on food and nutrition security in the face of HIV/AIDS shock. The results reveal a positive impact of household absorptive capacities on household food security for both HIV/AIDS affected and unaffected households as in all the cases, the adaptive capacities reduced food and nutrition insecurity. At the 1% level of significance, household adaptive capacity was associated with 0.99 points (Column I) decline in the probability of HIV/AIDS affected households being in hunger and 0.73 points (Column II) decline in the probability of HIV/AIDS unaffected households being in hunger. More so, at the 1% level of significance, adaptive capacity was associated with 0.122 points decline in the probability of affected households having an unacceptable HDDS and 0.093 points decline in the probability of unaffected households having an unacceptable dietary diversity score, *ceteris paribus*. Furthermore, the results reveal that at the 1% level of significance, adaptive capacity was associated with an increase in the propensity of both HIV/AIDS affected and unaffected households achieving an acceptable FCS, *ceteris paribus*.

Table 49. Treatment effect of adaptive capacity on food and nutrition security under HIV/AIDS shock

VARIABLES	Household is affected by HIV/AIDS (I)	Household is not affected by HIV/AIDS (II)
Household Hunger Scale	-0.0999***	-0.0736***
	(0.0364)	(0.00898)
Acceptable FCS	0.182***	0.140***
	(0.0216)	(0.00682)
Unacceptable HDDS	-0.122***	-0.0937***
	(0.0192)	(0.00532)
Observations	3,324	36,337

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.3.5 Climate related – drought

Table 50 shows the treatment effect of adaptive resilience capacities on food and nutrition security in the face of drought. *Ceteris paribus*, at the 1% level of significance, household adaptive capacity was associated with 0.084 points and 0.07 points decline in the probability of drought affected (Column I) and unaffected (Column II) households being in hunger, respectively. Furthermore, the results in Table 50 show that drought affected households were associated with 0.119 points decline in the probability of having an unacceptable HDDS and those not affected by drought were similarly impacted with a 0.083 points probability decline in the household having an unacceptable HDDS. The results also reveal that at the 1% level of significance, adaptive capacity was *ceteris paribus* associated with an increase in the propensity of both drought affected and unaffected households achieving an acceptable FCS by 0.138 and 0.156 points, respectively. The results reveal a positive impact of household adaptive capacities on household food nutrition security for both households affected and unaffected by drought shock.

Table 50. Treatment effect of adaptive capacity on food and nutrition security under drought shock

VARIABLES	Household is affected by drought (I)	Household is not affected by drought (II)
Household Hunger Scale	-0.0848***	-0.0705***
	(0.0133)	(0.0117)
Acceptable FCS	0.138***	0.156***
	(0.00867)	(0.0100)
Unacceptable HDDS	-0.119***	-0.0831***
	(0.00728)	(0.00705)
Observations	22,598	17,382

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.3.6 Human wildlife conflict

Table 51 shows the treatment effect of adaptive resilience capacities on food and nutrition security under human-wildlife shock. The results reveal that at the 1% level of significance, household adaptive capacity was associated with a decline in the probability of both the affected and unaffected households being in hunger and a decline in the probability of the both affected and unaffected households having an unacceptable HDDS, *ceteris paribus*. For example, Column (I) of Table 51 shows that at the 1% level of significance, the probability of the households affected by the human-wildlife conflict to have an unacceptable HDDS is reduced by 0.136 points and by 0.092 points for unaffected households, *ceteris paribus*. Overall, the results reveal a positive impact of household absorptive capacities on household food security for both households affected by human-wildlife conflict shock and those not affected as in all the cases, the absorptive capacities promoted the outcome variables, that is reduced food insecurity.

Table 51. Treatment effect of adaptive capacity on food and nutrition security in the face of human and wildlife conflict

VARIABLES	Household is affected by human-wildlife conflict (I)	Household is not affected by human-wildlife conflict (II)
Household Hunger Scale	-0.135***	-0.0700***
	(0.0337)	(0.00899)
Acceptable FCS	0.136***	0.141***
	(0.0224)	(0.00686)
Unacceptable HDDS	-0.136***	-0.0926***
	(0.0186)	(0.00539)
Observations	3,476	36,270

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

8.4 The impact of transformative capacities on food and nutrition security

8.4.1 Cereal price change

Table 52 shows the treatment effect of transformative resilience capacities on food and nutrition security in the face of cereal price change shock. The results show that at the 1% level of significance, household transformative capacity was associated with a decline in the household probability of achieving an acceptable FCS, ceteris paribus. In particular, Column (I) shows that for the full sample transformative capacities reduced the probability for a household achieving an acceptable FCS by 0.043 points at the 1% level of significance for the full sample, by 0.05 points (Column II) in for the shock affected and by 0.056 points (Column III) for the non-shock households, ceteris paribus. Furthermore, the results show that at the 1% level of significance, transformative capacity was associated with a decline in the probability of households having an unacceptable HDDS by 0.055 points (Column III)

for the non-shock households. However, the results showed no statistical significance on the impact of transformative capacities on hunger in the face of cereal price changes.

Table 52. Treatment effect of transformative capacity on food and nutrition security in the face of cereal price change

VARIABLES	Full sample (I)	Household is affected by cereal price change shock (II)	Household is not affected by cereal price change shock (III)
Household Hunger Scale	-0.00511	-0.0199	0.00296
	(0.0119)	(0.0235)	(0.0175)
Acceptable FCS	-0.0438***	-0.0507***	-0.0558***
	(0.0105)	(0.0171)	(0.0155)
Unacceptable DDS	-0.0143*	0.0142	-0.0282***
	(0.00735)	(0.0127)	(0.00976)
Observations	40,296	18,820	20,433

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.4.2 Social conflict

The results presented in Table 53 show the treatment effect of transformative resilience capacities on food and nutrition security under social conflict shock. Except for an increase in the propensity of the affected households achieving an acceptable food consumption score (FCS) by 0.067 points, households affected by social conflict at the 1% level of significance, no other significant difference was statistically significant for the other variables.

Table 53. Treatment effect of transformative capacity on food and nutrition security in the face of social conflict

VARIABLES	Household is affected by social conflict (I)	Household is not affected by social conflict (II)
Household Hunger Scale	-0.116*	0.0139
	(0.0594)	(0.0149)
Acceptable FCS	-0.0679***	0.0399
	(0.0114)	(0.0514)
Unacceptable DDS	0.0335	0.00851
	(0.0438)	(0.00879)
Observations	1,164	38,516

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.4.3 Livestock diseases

The results presented Table 54 shows the treatment effect of adaptive resilience capacities on food and nutrition security in the face of livestock disease shock. Column (I) of Table 54 indicates that at the 1% level of significance, transformative capacity reduced the probability of both affected and unaffected households achieving an acceptable FCS by 0.058 and 0.054 points, respectively. However, the results reveal that household transformative capacity does not impact on HHS and HDDS as there was no statistically significant difference between households affected by livestock diseases and those not affected.

Table 54. Treatment effect of transformative capacity on food and nutrition security in the face of livestock diseases

VARIABLES	Household is affected by livestock diseases (I)	Household is not affected by livestock diseases (II)
Household Hunger Scale	-0.0269	0.00311
	(0.0249)	(0.0150)
Acceptable FCS	-0.0586**	-0.0543***
	(0.0250)	(0.0118)
Unacceptable HDDS	0.0179	0.00356
	(0.0178)	(0.00910)
Observations	7,249	32,576

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

8.4.4 Health related - HIV/AIDS

Table 55 shows the treatment effect of transformative resilience capacities on food and nutrition security in the face of HIV/AIDS as a shock. The results reveal that at the 1% level of significance, transformative capacity was *ceteris paribus* associated with a reduced propensity for HIV/AIDS unaffected households achieving an acceptable FCS by 0.072 points. However, the results reveal that household transformative capacity did not impact on household acceptable FCS for HIV/AIDS affected households and on household hunger scale and HDDS as the difference was not statistically significant.

Table 55. Treatment effect of transformative capacity on food and nutrition security in the face of HIVAIDS

VARIABLES	Household is affected by HIV/AIDS (I)	Household is not affected by HIV/AIDS (II)
Household Hunger Scale	**0.0120**	**0.0206**
	(0.0531)	**(0.0149)**
Acceptable FCS	**-0.0588***	**-0.0721*** **
	(0.0353)	**(0.0109)**

Unacceptable HDDS	**0.00196**	**0.0122**
	(0.0316)	**(0.00934)**
Observations	**3,324**	**36,337**

Standard errors in parentheses
***** p<0.01, ** p<0.05, * p<0.1**

8.4.5 Climate related - drought

Similar to the impact of transformative capacity on household food and nutrition security in the face of HIV/AIDS shock, Table 56 shows that at the 1% level of significance, transformative capacity was *ceteris paribus* associated with a reduced propensity of households not affected by drought achieving an acceptable FCS by 0.09 points. However, the results reveal that household transformative capacity did not impact on household acceptable FCS for drought affected households and on household hunger scale and HDDS as the difference was not statistically significant.

Table 56. Treatment effect of transformative capacity on food and nutrition security in the face of drought

VARIABLES	Household is affected by drought (I)	Household is not affected by drought (II)
Household Hunger Scale	-0.00308	-0.00961
	(0.0186)	(0.0219)
Acceptable FCS	-0.0255*	-0.0908***
	(0.0135)	(0.0186)
Unacceptable DDS	0.00211	0.00304
	(0.0107)	(0.0127)
Observations	22,598	17,382

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

8.4.6 Human Wildlife

Table 57 shows the treatment effect of transformative resilience capacities on food and nutrition security in the face of human-wildlife conflict. The results reveal that at the 1% level of significance, transformative capacity was *ceteris paribus* associated with a reduced propensity for households not affected by human-wildlife conflict having an acceptable FCS by 0.072 points. However, the results reveal that household transformative capacity did not impact on acceptable FCS for households affected by human-wildlife conflict and on household hunger scale and HDDS.

Table 57. Treatment effect of transformative capacity

VARIABLES	Household is affected by human-wildlife conflict (I)	Household is not affected by human-wildlife conflict (II)
Household Hunger Scale	-0.0160	0.00811
	(0.0479)	(0.0151)
Acceptable FCS	-0.0631*	-0.0704***
	(0.0353)	(0.0116)
Unacceptable HDDS	0.0345	0.00669
	(0.0310)	(0.00915)
Observations	3,476	36,270

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Chapter Summary

Absorptive capacity

- The results show that absorptive capacity reduced the propensity of both drought affected and unaffected households from being in hunger, reduced the probability of both households having an unacceptable HDDS and increased the probability of both affected and unaffected households achieving an acceptable FCS.

- The above trends on the impact of absorptive capacity on food and nutrition security in the face of drought were similar for all other shocks investigated in this study such as HIV/AIDS, social conflict, human and wildlife conflict and livestock diseases.
- Overall, the results reveal a positive impact of household absorptive capacities on household food and nutrition security in the face of the following shocks; drought, livestock diseases, social conflict, human and wildlife conflict and HIV/AIDS; absorptive capacities promoted the outcome variables, that is, reduced food and nutrition insecurity.

Adaptive capacity

- Overall, the results reveal a positive impact of household adaptive capacities on food security in the face of the following shocks; drought, livestock diseases, social conflict, human and wildlife conflict and HIV/AIDS, i.e. adaptive capacities reduced food and nutrition insecurity.
- For example, the results reveal that at the 1% level of significance, household adaptive capacity was associated with 0.084 points and 0.07 points decline in the probability of drought affected and unaffected households being in hunger, respectively.
- Drought affected households were associated with 0.119 points decline in the probability of having an unacceptable HDDS and those not affected by drought were similarly impacted with a 0.083 points probability decline in the household having an unacceptable HDDS.
- More so, adaptive capacity is *ceteris paribus* associated with an increase in the propensity of both drought affected and unaffected households achieving an acceptable FCS by 0.138 and 0.156 points, respectively.
- The above trends on the impact of adaptive capacity on food and nutrition security in the face of drought shock were similar for all other shocks investigated in this study.

Transformative capacity

- For all shocks considered in this study, the results reveal that at the 1% level of significance, transformative capacity was *ceteris paribus* associated with a reduced probability of households not affected by shocks achieving an acceptable FCS.
- However, the results show that household transformative capacity did not have an impact on acceptable FCS for households affected shocks.
- The results reveal that household transformative capacity did not impact on household hunger and household dietary diversity as there was no statistically significant difference between shock affected and not affected households.

Recommendations

Based on the above major findings, the following recommendations are put forward.

1. The study revealed that most of the sampled households are yet to build up transformative capacities. There is need to build and improve the transformative capacities.

- For example, in rural areas, an important pathway for building long lasting resilience capacity to food insecurity is through productivity and efficiency. As such, the GoZ and its Development Partners are encouraged to continue promoting efficient production systems, for instance through the adoption of better agronomic practices, diversification, agro-ecological management or sustainable intensification (e.g. the Pfumvudza model).
- Resilience capacity could be developed through asset accumulation and capital formation as a household with more assets is likely to be more resilient to shocks that threaten food security through consumption smoothing (i.e., selling assets to maintain current level of consumption). The livestock restocking exercise through the provision of heifers and subsidised artificial insemination are good intervention programmes being implemented by the GoZ and its Development Partners that need to be upscaled throughout the country.

2. The study showed that female headed households and those with chronically ill members are move vulnerable to food and nutrition insecurities and it is therefore recommended that resilience intervention programmes target more of such households so as to build and improve their resilience capacities and improve on their food and nutrition security. Targeting marginalised groups such as women is crucial to reducing vulnerability and building resilience. Resilience policy-making, programming and funding instruments should embrace the 'leave no one behind' principle explicitly, prioritising actions to support the poorest and most marginalised with the sim of ending extreme poverty and reducing inequalities.

Appendices

Appendix 1 of this report.

Table 1. Distribution of observations by year

Survey Year	Number of observations	Proportion of total number of observations
2017	11,822	0.288
2018	14,251	0.347
2019	15,025	0.366

Total	41,098

Table 2 shows that within the total pool of 41,098 sampled rural households under consideration, the provinces of Mashonaland East and Mashonaland Central with the respective total samples of 6,187 and 5,477 rural households had the largest contribution to the three-year pooled sample. On the other hand, Mashonaland West, Masvingo, and Manicaland provinces had the least contribution to the total pool of rural households in the sample. They had the respective contributions of 4,745, 4,771 and 4,778 observations. The provincial allocation of the sampled households stems from the 2012 ZimSTAT master sampling frame. A provincial distribution pie chart is given in Appendix 2 of this report.

Table 2. Provincial distribution of sample households

Province	Survey Year:			Total
	2017	2018	2019	
Manicaland	1,370	1,652	1,756	4,778
Mashonaland Central	1,576	1,911	1,990	5,477
Mashonaland East	1,792	2,139	2,256	6,187
Mashonaland West	1,369	1,632	1,744	4,745
Matabeleland North	1,386	1,668	1,744	4,798
Matabeleland South	1,380	1,661	1,845	4,886
Midlands	1,562	1,914	1,980	5,456
Masvingo	1,387	1,674	1,710	4,771
Total	11,822	14,251	15,025	41,098

Chapter Highlights

- Study covers three ZimVAC Rural Livelihoods Assessments (RLAs) from 2017 up to and including 2019.
- The study covers a total of 41,098 rural households.
- The year 2017 constitutes 28.8% of the total sampled rural households, while 2018 and 2019 with 14,251 and 15,025 observations, constitute 34.7% and 36.6% of the total sample, respectively.
- Mashonaland East and Central with the respective total samples of 6,187 and 5,477 rural households have the largest contribution to the three-year pooled sample.
- Mashonaland West, Masvingo, and Manicaland provinces have the least contribution to the total pool of rural households in the sample. They have the respective contributions of 4,745, 4,771 and 4,778 observations.

CHAPTER 4

Demographic Characteristics of Sample Households

4.3 Introduction

This Chapter provides the descriptive analysis of the trends in the demographic characteristics of the sampled rural households.

4.4 Trends in the demographic character

Table 3 shows the distribution of the demographic characteristics of the rural households by survey year. The table shows an increase in the proportion of female headed households from 32.7% in 2017 to 50.9%. Furthermore, there was a decline in the average age of the household heads from 50.5 years in 2017 to 46.7 years in 2019. The trends in the proportion of female headed households were partly explained by the proportion of household heads who were married but living apart from their spouse. The proportion of household heads who were married and living apart from their spouse increased from 7% in 2017 to 7.6% in 2019.

Table 3 also shows that the average number of household members who were mentally and chronically ill had been increasing in the period under analysis. Specifically, the average number of household members who were mentally ill increased from 0.142 in 2017 to 0.222 in 2019. On the other hand, the average number of household members who were chronically ill increased from 0.105 in 2017 to 0.146 in 2019. The increase in both variables was statistically valid with a 99% level of confidence.

Table 3. Demographic characteristics of sampled households by year

Variable		Survey Year:						P-value
		2019		2018		2017		
		Mean	S. D	Mean	S. D	Mean	S. D	
Household head is female		0.509	0.500	0.375	0.484	0.327	0.469	0.000
Household head age [Years]		46.660	17.557	49.750	17.234	50.525	16.952	0.000
Marital status of household head:	Married living together	0.650	0.477	0.626	0.484	0.644	0.479	0.196
	Married living apart	0.076	0.265	0.073	0.259	0.070	0.254	0.001
	Divorced/separated	0.057	0.233	0.048	0.213	0.052	0.222	0.000
	Widow/widower	0.180	0.384	0.220	0.414	0.216	0.412	0.000
	Never married	0.037	0.189	0.034	0.182	0.018	0.134	0.000
Education level of household head:	None	0.162	0.369	0.206	0.405	0.218	0.413	0.000
	Primary level	0.403	0.491	0.384	0.486	0.373	0.484	0.242
	ZJC level	0.142	0.349	0.121	0.326	0.126	0.332	0.000
	O' level	0.270	0.444	0.261	0.439	0.257	0.437	0.161
	A' level	0.008	0.089	0.008	0.089	0.009	0.092	0.000
	Diploma/Certificate after primary	0.003	0.056	0.003	0.057	0.005	0.070	0.000
	Diploma/Certificate after secondary	0.007	0.085	0.012	0.108	0.010	0.098	0.000
	Graduate/Post-Graduate	0.004	0.061	0.005	0.073	0.004	0.062	0.023
Household size		4.813	2.180	4.572	2.230	4.996	2.207	0.000
Average household members with:	Mental illness	0.222	0.522	0.144	0.421	0.142	0.555	0.000
	Chronic illness	0.146	0.429	0.117	0.385	0.105	0.488	0.000

Chapter Highlights

- ✓ There was an increase in the proportion of female headed households from 32.7% in 2017 to 50.9%.
- ✓ The increasing proportion of female headed households was partly explained by the increase in the proportion of household heads who are married but living apart from their spouse which rose from 7% in 2017 to 7.6% in 2019.
- ✓ The average number of household members who were mentally ill increased from 0.142 in 2017 to 0.222 in 2019.
- ✓ On the other hand, the average number of household members who were chronically ill increased from 0.105 in 2017 to 0.146 in 2019.

CHAPTER 5

Food and Nutrition Security Outcomes

5.5 Introduction

The term "food security and nutrition" acknowledges the importance of nutrition for achieving food security but maintains the traditional focus on food availability, access, and stability. This perspective emphasizes that food security is a precondition to adequate nutrition[12]. The concept of food and nutrition security has become mainstream in many organizations (e.g., IFPRI, FAO, and UNICEF) and academia. Food and nutrition security underlines the need for greater integration of nutrition and food security in programs, policies, and research and considers appropriate levels of nutrition the ultimate goal of food security. Although food security is essential to ensure adequate nutrition and prevent hunger, the concepts of food security, optimal nutrition and lack of hunger and undernutrition are interlinked but not synonymous.

5.6 Household Hunger scale (HHS)

The Household Hunger Scale (HHS) is a household food deprivation scale and can be used for a variety of objectives, including to: monitor the prevalence of hunger over time across regions, assess the food security situation in a country or region, to provide evidence for the development and implementation of policies and programs that address food insecurity and hunger and to provide information for early warning or nutrition and food security surveillance (FANTA, 2011)[13][14]. The HHS focuses on the food quantity dimension of food access and does not measure dietary quality. It is different from the other household food insecurity indicators as it assesses only the most severe experiences of food insecurity[15]. The HHS is built around 3 questions about perceptions of a household on varying degrees of hunger by the number of times a household has experienced hunger within the past 30 days prior to the survey. The household hunger score ranges from 0 to 6.[16]

5.6.1 Descriptive analysis of the household hunger scale

The results presented in Table 4 show an increase in HHS from 0.203 in 2017 to 0.289 in 2019. The increase was statistically valid with a 99% level of confidence. This increase in the HHS can be attributed to the various shocks and hazards that seemed to be increasing

[12] El Bilali et al. (2019). Food and nutrition security and sustainability transitions in food systems. Food Energy Security. 8:e00154. https://doi.org/10.1002/fes3.154
[13] Ballard et al., (2011). Household Hunger Scale: Indicator Definition and Measurement Guide
[14] https://www.fantaproject.org/monitoring-and-evaluation/household-hunger-scale-hhs
[15] Deitchler et al., (2010). Validation of a Measure of Household Hunger for Cross-cultural Use
[16] http://www.fao.org/fileadmin/user_upload/wa_workshop/docs/HH_Hunger_Scale.pdf

on a yearly basis, e.g. droughts and high inflation. For example, every district has been affected by drought during the past thirty years, with varying levels of severity and frequency. Severe drought episodes have been observed in 1991–1992, 1994–1995, 2002–2003, 2015–2016, with the south-western provinces of Matabeleland North and South showing particularly high levels[3].

Table 4. Descriptive analysis of the household hunger scale

		Mean	S. D
Survey year:	2017	0.203	0.576
	2018	0.273	0.587
	2019	0.289	0.667
P-value		0.000	

5.6.2 Inferential analysis of the Household Hunger Scale (HHS)

Table 5 shows the results for inferential analysis of Household Hunger Scale (HHS). The results reveal that the year to year increase in HHS was significant at the 1% level of significance. Similarly, the general year trend shows a significant difference at the 1% level of significance. Furthermore, the results indicate that households headed by older people were likely to have a reduced HHS by 0.27 points. In addition, increasing the education level of household head was likely to reduce HHS. The results also show that at the 1% level of significance, increasing household size by one member increased the likelihood of the household to be in hunger by 1.36%. More so, households with chronically ill members were 9.16% more likely to experience hunger as compared to households without chronically ill members, at the 1% level of significance. Except for Mashonaland Central and Midlands provinces, households in Mashonaland East, Mashonaland West, Matabeleland North, Matabeleland South and Masvingo provinces were likely to have a high propensity for a reduced HHS, at the 1% level of significance.

Table 5. OLS and Tobit estimates of year on year and general trends in HHS

VARIABLES	OLS	2-Limit Tobit
	(I)	(II)
Survey year is 2019 [1 if Yes, 0 if No]	0.0801***	0.498***
	(0.00789)	(0.0437)
Survey year is 2018 [1 if Yes, 0 if No]	0.0746***	0.573***
	(0.00726)	(0.0424)
General trend	0.0388***	0.225***
	(0.00396)	(0.0208)
Household head is female [1 if Yes, 0 if No]	-0.00461	0.00511
	(0.00673)	(0.0347)
Household head age [Years]	-0.00270***	-0.0148***
	(0.000225)	(0.00119)

Married living together	0.00715	0.0857
	(0.0199)	(0.108)
Married living apart	-0.0546**	-0.344***
	(0.0214)	(0.124)
Divorced/separated	0.0615***	0.360***
	(0.0238)	(0.124)
Widow/widower	0.0541**	0.339***
	(0.0215)	(0.115)
Primary level	-0.0755***	-0.382***
	(0.00963)	(0.0448)
ZJC	-0.123***	-0.629***
	(0.0120)	(0.0611)
O' level	-0.182***	-0.978***
	(0.0108)	(0.0549)
A' level	-0.245***	-1.699***
	(0.0270)	(0.245)
Diploma/Certificate after primary	-0.251***	-1.875***
	(0.0286)	(0.398)
Diploma/Certificate after secondary	-0.257***	-1.827***
	(0.0214)	(0.245)
Graduate/Post-Graduate	-0.305***	-2.557***
	(0.0195)	(0.419)
Household size	0.0136***	0.0778***
	(0.00154)	(0.00758)
Household members with mental illness	0.0187**	0.0515
	(0.00854)	(0.0368)
Household members with chronic illness	0.0916***	0.402***
	(0.0103)	(0.0392)
Mashonaland Central	-0.0116	0.0459
	(0.0127)	(0.0653)
Mashonaland East	-0.0628***	-0.299***
	(0.0117)	(0.0661)
Mashonaland West	0.0454***	0.290***
	(0.0136)	(0.0656)
Matabeleland North	-0.0495***	-0.249***
	(0.0129)	(0.0705)
Matabeleland South	0.0116	0.142**
	(0.0134)	(0.0669)
Midlands	-0.0278**	-0.122*
	(0.0126)	(0.0667)
Masvingo	-0.0632***	-0.370***
	(0.0126)	(0.0711)
Constant	0.364***	-1.738***
	(0.0254)	(0.136)
Observations	40,296	40,296
R-squared	0.029	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5.7 Food Consumption Score (FCS)

The FCS is a composite score based on dietary diversity, food frequency, and relative nutritional importance of different food groups. It is an important measure of food consumption. The FCS is calculated based on the past 7-day food consumption recall for the

household and classified into three categories: poor consumption; borderline; and acceptable consumption[17]. These FCS thresholds are delineated in Table 6 below.

5.7.1 Descriptive analysis of the Food Consumption Score (FCS)

Table 6 shows that a greater proportion of the sampled households in the three years under review had an acceptable diet. For the period under review, year 2019 had the lowest (43.7%) proportion of households with an acceptable diet and year 2018 (50.5%) had the highest. The highest proportion of households with poor (27.7%) and borderline (28.6%) FCS were in 2019. The high proportion of households with a poor FCS can be attributed to the longer dry spells that lasted 29 days during the 2018/2019 cropping season, resulting in low yields that year.

Table 6. Descriptive analysis of FCS

		2019	2018	2017	P-value
Category of FCS is:	Poor	0.277	0.230	0.235	0.000
	Borderline	0.286	0.265	0.269	0.012
	Acceptable	0.437	0.505	0.495	0.547

Appendix 3 shows a pictorial representation of the food consumption score by year.

5.7.2 Inferential analysis of the trends in FCS for the period under review

Inferential analysis results presented in Table 7 shows that in comparison with the base year of 2017, there is a 4.93% decrease in the probability of a household having an acceptable diet at the 1% level of significance. The general trend over the three years under analysis of 2.60% is also statistically valid at the 1% level of significance after controlling for observed confounders.

The results show that an increase in the age of the household head by one year increased household propensity to have an acceptable diet. The same trend was observed for households headed by educated heads. In addition, the results reveal that at the 1% level of significance, households with a member suffering from chronic illness or from mental illness had a reduced propensity to have an acceptable FCS as compared to households without members suffering from chronic illness or mental illness. At provincial level, the results show that at the 1% level of significance, households in Mashonaland Central and

[17] https://www.wfp.org/content/technical-guidance-sheet-food-consumption-analysis-calculation-and-use-food-consumption-score-food-s

Matabeleland North provinces had a reduced propensity to have an acceptable FCS as compared to the base province of Manicaland.

Table 7. Estimates of year on year and general trends in acceptable FCS

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Survey year is 2019 [1 if Yes, 0 if No]	-0.0493***	-0.127***	-0.205***
	(0.00621)	(0.0162)	(0.0261)
Survey year is 2018 [1 if Yes, 0 if No]	0.0113*	0.0298*	0.0476*
	(0.00620)	(0.0160)	(0.0258)
General trend	-0.0260***	-0.0671***	-0.108***
	(0.00310)	(0.00806)	(0.0130)
Household head is female [1 if Yes, 0 if No]	-0.00681	-0.0168	-0.0277
	(0.00521)	(0.0136)	(0.0219)
Household head age [Years]	0.00297***	0.00768***	0.0124***
	(0.000174)	(0.000456)	(0.000737)
Married living together	-0.00613	-0.0164	-0.0260
	(0.0158)	(0.0408)	(0.0659)
Married living apart	0.0144	0.0366	0.0590
	(0.0177)	(0.0457)	(0.0737)
Divorced/separated	-0.0613***	-0.160***	-0.259***
	(0.0186)	(0.0484)	(0.0782)
Widow/widower	-0.0612***	-0.159***	-0.255***
	(0.0169)	(0.0437)	(0.0707)
Primary level	0.0888***	0.232***	0.374***
	(0.00709)	(0.0187)	(0.0302)
ZJC	0.147***	0.381***	0.614***
	(0.00929)	(0.0242)	(0.0391)
O' level	0.201***	0.518***	0.835***
	(0.00832)	(0.0219)	(0.0355)
A' level	0.298***	0.770***	1.248***
	(0.0276)	(0.0748)	(0.123)
Diploma/Certificate after primary	0.392***	1.082***	1.784***
	(0.0343)	(0.120)	(0.209)
Diploma/Certificate after secondary	0.394***	1.071***	1.755***
	(0.0224)	(0.0741)	(0.127)
Graduate/Post-Graduate	0.456***	1.296***	2.151***
	(0.0292)	(0.116)	(0.208)
Household size	-0.000120	-0.000332	-0.000497
	(0.00116)	(0.00302)	(0.00487)
Household members with mental illness	-0.0247***	-0.0648***	-0.107***
	(0.00568)	(0.0151)	(0.0246)
Household members with chronic illness	-0.0348***	-0.0924***	-0.150***
	(0.00643)	(0.0174)	(0.0282)
Mashonaland Central	-0.0321***	-0.0829***	-0.135***
	(0.00980)	(0.0256)	(0.0413)
Mashonaland East	0.0316***	0.0822***	0.132***
	(0.00955)	(0.0247)	(0.0397)
Mashonaland West	0.00367	0.00988	0.0158
	(0.0101)	(0.0263)	(0.0423)
Matabeleland North	-0.0411***	-0.107***	-0.171***
	(0.0101)	(0.0264)	(0.0426)
Matabeleland South	0.0692***	0.179***	0.289***
	(0.0102)	(0.0264)	(0.0425)

Midlands	0.0530***	0.137***	0.221***
	(0.00984)	(0.0255)	(0.0410)
Masvingo	0.0808***	0.209***	0.336***
	(0.0101)	(0.0263)	(0.0423)
Constant	0.241***	-0.671***	-1.085***
	(0.0200)	(0.0521)	(0.0844)
Observations	40,296	40,296	40,296
R-squared	0.042		

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.8 Household dietary diversity score

Household Dietary Diversity Score (HDDS) is an important nutrition outcome measuring the economic ability of a household to access a variety of foods during a determined period. HDDS is defined as the number of different food groups consumed over a given reference period[18] and Dietary Diversity scores are defined as the number of foods or food groups consumed by an individual (or by any member of the household inside the home (HDDS) over a reference time period[19]. HDDS is an attractive proxy indicator for the following reasons;

iv. A more diversified diet is an important outcome in and of itself.
v. A more diversified diet is associated with a number of improved outcomes in areas such as birth weight, child anthropometric status, and improved hemoglobin concentrations.
vi. A more diversified diet is highly correlated with such factors as caloric and protein adequacy, percentage of protein from animal sources (high quality protein), and household income. Even in very poor households, increased food expenditure resulting from additional income is associated with increased quantity and quality of the diet.

5.8.1 Descriptive analysis of the HDDS

The results presented in Table 8 show an increase in the Household Dietary Diversity Score (HDDS) for the period under review. For example, the results reveal that 2019 had the highest HDDS (0.171) and 2017 had the lowest HDDS. The increase in HDDS was statistically valid with a 99% level of confidence.

Table 8. Descriptive analysis of the HDDS

		Mean
Survey year	2019	0.171
	2018	0.140

[18] Swindale and Bilinsky. 2006. *Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide (v.2)*. Washington, D.C.: FHI 360/FANTA.
[19] Huluka et al. (2019) Determinants of household dietary diversity in the Yayo biosphere reserve of Ethiopia: An empirical analysis using sustainable livelihood framework, Cogent Food & Agriculture, 5:1, DOI: 10.1080/23311932.2019.1690829

2017	0.105
P-value	0.000

5.8.2 Inferential analysis of the trends in Household Dietary Diversity Score (HDDS)

Table 9 presents the results of inferential analysis of the trends in HDDS for the period under review. The results show that at the 1% level of significance, *ceteris paribus*, increasing the years from 2017 increases the probability of a household having a high dietary diversity. The increase in dietary diversity over the three years under review can be attributed to the several nutrition interventions by both the Government and Development Partners. An example of a nutrition intervention programme is the promotion of nutrition gardens. However, at the 1% level of significance, households headed by older persons were likely to have a lower dietary diversity as compared to households headed by young people, all things being constant. This result corroborates with findings by Huluka et al. (2019)[20] and Codjoe et al. (2016)[21] that older household heads face difficulty in diversifying their family diet partly due to loss of energy to work longer hours per day and partly because of lack of alternative sources of income to purchase nutrient-dense foods that can diversify household diets.

Unexpectedly, the results in Table 9 also show that at the 1% level of significance, increasing the education level of household head reduced the propensity of a household from having a dietary diversity. This result is contrary to other findings in literature[9,10] which show that households with educated heads have high household dietary diversity score. Table 9 also reveals that at the 1% level of significance, households in Mashonaland Central, Mashonaland West and Matabeleland North provinces were associated with a high dietary diversity whilst those in Mashonaland East, Matabeleland South and Masvingo provinces are associated with a low dietary diversity as compared to the base province of Manicaland, *ceteris paribus*.

Table 9. Estimates of year on year trends in Household Dietary Diversity Score (HDDS)

VARIABLES	OLS	Probit	Logit
	(I)	(II)	(III)
Survey year is 2019 [1 if Yes, 0 if No]	0.0635***	0.297***	0.566***
	(0.00427)	(0.0208)	(0.0391)

[20]Huluka et al. (2019) Determinants of household dietary diversity in the Yayo biosphere reserve of Ethiopia: An empirical analysis using sustainable livelihood framework, Cogent Food & Agriculture, 5:1, DOI: 10.1080/23311932.2019.1690829

[21] Codjoe et al. (2016). Urban Household Characteristics and Dietary Diversity: An Analysis of Food Security in Accra, Ghana. *Food Nutr Bull*. 2016;37(2):202-218. doi:10.1177/037957211663188

Survey year is 2018 [1 if Yes, 0 if No]	0.0355***	0.179***	0.344***
	(0.00406)	(0.0212)	(0.0401)
General trend	0.0316***	0.146***	0.277***
	(0.00214)	(0.0102)	(0.0189)
Household head is female [1 if Yes, 0 if No]	0.00736*	0.0443***	0.0764**
	(0.00381)	(0.0168)	(0.0306)
Household head age [Years]	-0.00131***	-0.00602***	-0.0108***
	(0.000124)	(0.000570)	(0.00105)
Married living together	0.0197*	0.0753	0.150
	(0.0106)	(0.0532)	(0.0997)
Married living apart	-0.0202*	-0.147**	-0.269**
	(0.0114)	(0.0611)	(0.116)
Divorced/separated	0.0470***	0.188***	0.350***
	(0.0132)	(0.0610)	(0.113)
Widow/widower	0.0246**	0.101*	0.200*
	(0.0116)	(0.0569)	(0.106)
Primary level	-0.0717***	-0.291***	-0.521***
	(0.00551)	(0.0215)	(0.0381)
ZJC	-0.113***	-0.482***	-0.876***
	(0.00672)	(0.0299)	(0.0548)
O' level	-0.142***	-0.645***	-1.188***
	(0.00607)	(0.0270)	(0.0498)
A' level	-0.169***	-0.845***	-1.590***
	(0.0144)	(0.114)	(0.235)
Diploma/Certificate after primary	-0.176***	-1.141***	-2.262***
	(0.0142)	(0.218)	(0.507)
Diploma/Certificate after secondary	-0.186***	-1.126***	-2.247***
	(0.0101)	(0.134)	(0.309)
Graduate/Post-Graduate	-0.207***	-1.586***	-3.238***
	(0.00959)	(0.266)	(0.705)
Household size	-0.00111	-0.00483	-0.00999
	(0.000814)	(0.00379)	(0.00697)
Household members with mental illness	0.0143***	0.0628***	0.111***
	(0.00428)	(0.0175)	(0.0314)
Household members with chronic illness	0.00926*	0.0378*	0.0721**
	(0.00489)	(0.0200)	(0.0358)
Mashonaland Central	0.0281***	0.122***	0.212***
	(0.00705)	(0.0317)	(0.0582)
Mashonaland East	-0.0231***	-0.117***	-0.230***
	(0.00620)	(0.0325)	(0.0614)
Mashonaland West	0.0473***	0.198***	0.360***
	(0.00739)	(0.0322)	(0.0586)
Matabeleland North	0.0784***	0.314***	0.564***
	(0.00771)	(0.0318)	(0.0575)
Matabeleland South	-0.0472***	-0.245***	-0.472***
	(0.00652)	(0.0355)	(0.0677)
Midlands	-0.00282	-0.0143	-0.0252
	(0.00664)	(0.0325)	(0.0605)
Masvingo	-0.0229***	-0.110***	-0.220***
	(0.00663)	(0.0345)	(0.0652)
Constant	0.228***	-0.731***	-1.219***
	(0.0135)	(0.0652)	(0.120)
Observations	40,296	40,296	40,296
R-squared	0.040		

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Chapter Highlights

Household Hunger Scale (HHS)

- There is an increase in HHS from 0.203 in 2017 to 0.289 in 2019. The increase was statistically valid with a 99% level of confidence.
- The results indicated that households headed by older people were likely to have 0.27 points reduced HHS.
- At the 1% level of significance, increasing household size by one member increased the likelihood of the household to be in hunger by 1.36%.
- Households with chronically ill members were 9.16% more likely to experience hunger as compared to households without chronically ill members, at the 1% level of significance.
- Except for Mashonaland Central and Midlands provinces, households in Mashonaland East, Mashonaland West, Matabeleland North, Matabeleland South and Masvingo provinces had a high propensity for a reduced HHS, at the 1% level of significance.

Food Consumption Score

- Year 2019 had the lowest (43.7%) proportion of households with an acceptable diet and year 2018 (50.5%) had the highest.
- The highest proportion of households with poor (27.7%) and borderline (28.6%) FCS were in 2019.
- On the other hand, an increase in the age of household head by one year increased household propensity to have an acceptable diet.
- Households with a member suffering from chronic or mental illness had a reduced propensity to have an acceptable FCS as compared to households without members suffering from chronic or mental illness.

Household dietary diversity score

- The results show that Year 2019 had the highest HDDS (0.171) and 2017 had the lowest HDDS.
- Households headed by older people were likely to have a lower dietary diversity as compared to households headed by young people, *ceteris paribus*.
- At the 1% level of significance, increasing the education level of household head reduced the propensity of a household having higher HDDS.
- Households in Mashonaland Central, Mashonaland West and Matabeleland North provinces were associated with a high dietary diversity whilst those in Mashonaland East, Matabeleland South and Masvingo provinces were associated with a low dietary diversity as compared to the base province of Manicaland, ceteris paribus.

CHAPTER 6

Incidence and Severity of Shocks and Stressors at the Household Level

6.4 Introduction

A shock is defined as a sudden event that impacts on the vulnerability of a system and its components and a stress is a 'long-term trend that undermines the potential of a given system and increases the vulnerability of actor within it[22]. The impacts of shocks and stresses at the community level depend on the intensity of the hazard, combined with the vulnerability and the capacity of those affected to cope with them.

6.5 Economic related stressors

6.5.1 Descriptive analysis of incidence of economic stressors

Table 10 shows the various economic related stressors experienced by the sampled households. The results show a significant ($p<0.01$) increase in the incidence of economic stressors over the three-year period under review, from 2017 to 2019. The results show that cash shortage was the most experienced economic stressor throughout the three years under review and the incidence of this stress increased at an alarming rate from 46.9%s in 2017 to 81.6% in 2019. This alarming increase in cash shortage as a shock can be attributed to high inflation. A graphical depiction of the trends in economic stressors is given in Appendix 4 of this report.

Table 10. Descriptive analysis of incidence of economic stressors

Stressors	2017		2018		2019		P - Value
	Mean	S. D	Mean	S. D	Mean	S. D	
Cereal price change	0.126	0.332	0.421	0.494	0.789	0.408	0.000
Livestock price change	0.036	0.186	0.215	0.411	0.393	0.488	0.000
Cash shortage	0.469	0.499	0.716	0.451	0.816	0.387	0.000
Loss employment	0.034	0.181	0.057	0.232	0.034	0.180	0.000
Economic shocks index [0 - 4]	0.625	0.730	1.402	1.049	2.023	0.973	0.000

[22] https://doi.org/10.1093/heapol/czaa002

6.5.2 Inferential analysis of trends in the incidence of economic stressors

The observed trends in Table 10 are also confirmed by the inferential analysis results presented in Table 11, which show significant year to year increases in the proportion of households affected by all economic stressors. Save for loss of employment, the results indicate that the general trends of the incidence of economic stressors had been rising in the period under analysis.

The results reveal that at the 1% level of significance, an increase in the age of household head by one year decreased the propensity for the household to be affected by cereal price change (0.001 points) and by loss of employment (0.002 points). However, the propensity to be affected by livestock theft was increased by 0.025 points. This observed decrease in loss of employment as a shock could be attributed to the high unemployment rate and the shrinking base of employed people in Zimbabwe such that the proportion of sampled household heads that are formally employed was already low. The 2019 ZimSTAT Labour Force and Child Labour Survey estimated the National EPR was at 36%. Table 11 further reveals that at the 1% level of significance, increasing household size by one member increased the propensity for the households to be affected by all the economic stressors except for loss of employment. More so, households with chronically ill members had an increased likelihood to be affected by all the economic stressors as compared to households without a chronically ill member, *ceteris paribus*. Probit estimates of the year on year trends in economic stressors are shown in Appendix 5 of this report.

Table 11. OLS estimates of year on year trends in economic stressors

VARIABLES	Cereal price change	Livestock price change	Cash shortage	Loss employment	Economic shocks index [0 - 4]
	(I)	(II)	(III)	(IV)	(V)
Survey year is 2019 [1 if Yes, 0 if No]	0.656***	0.354***	0.346***	-0.00299	1.388***
	(0.00485)	(0.00452)	(0.00584)	(0.00243)	(0.0108)
Survey year is 2018 [1 if Yes, 0 if No]	0.297***	0.180***	0.250***	0.0222***	0.783***
	(0.00525)	(0.00392)	(0.00606)	(0.00265)	(0.0110)
General year trend	0.330***	0.177***	0.169***	-0.00280**	0.691***
	(0.00245)	(0.00235)	(0.00288)	(0.00122)	(0.00546)
Household head is female [1 if Yes, 0 if No]	0.00300	0.0111**	-0.0103**	-0.00155	0.00520
	(0.00454)	(0.00460)	(0.00456)	(0.00215)	(0.0102)
Household head age [Years]	-0.00108***	0.000842***	0.000166	-0.000255***	-0.000263
	(0.000152)	(0.000144)	(0.000159)	(7.02e-05)	(0.000333)
Married living together	0.0505***	0.0245*	0.0358**	0.000230	0.112***
	(0.0144)	(0.0134)	(0.0142)	(0.00694)	(0.0314)
Married living apart	0.00668	-0.0235	0.00286	0.00716	-0.00472
	(0.0162)	(0.0148)	(0.0161)	(0.00777)	(0.0353)
Divorced/separated	0.0379**	-0.0345**	0.00652	0.00594	0.0211
	(0.0169)	(0.0155)	(0.0170)	(0.00812)	(0.0365)

Widow/widower	0.0204	-0.0284**	0.00869	0.0125*	0.0183
	(0.0154)	(0.0143)	(0.0153)	(0.00752)	(0.0337)
Primary level	0.0200***	0.0454***	0.0484***	0.00275	0.115***
	(0.00619)	(0.00569)	(0.00659)	(0.00293)	(0.0135)
ZJC	0.0401***	0.0603***	0.0680***	0.00365	0.166***
	(0.00803)	(0.00766)	(0.00836)	(0.00383)	(0.0175)
O' level	0.0106	0.0411***	0.0659***	0.00317	0.118***
	(0.00724)	(0.00674)	(0.00760)	(0.00345)	(0.0157)
A' level	0.0110	0.0377*	0.0854***	0.0116	0.129**
	(0.0251)	(0.0224)	(0.0253)	(0.0130)	(0.0522)
Diploma/Certificate after primary	0.0365	0.105***	0.0158	0.0250	0.196**
	(0.0362)	(0.0359)	(0.0381)	(0.0198)	(0.0852)
Diploma/Certificate after secondary	0.0235	0.0408*	0.121***	0.00790	0.193***
	(0.0237)	(0.0210)	(0.0222)	(0.0114)	(0.0485)
Graduate/Post-Graduate	0.0341	0.0194	0.0661*	-0.0112	0.114
	(0.0355)	(0.0293)	(0.0338)	(0.0131)	(0.0706)
Household size	0.00526***	0.00358***	0.00441***	-0.000740	0.0134***
	(0.000998)	(0.000963)	(0.00105)	(0.000481)	(0.00220)
Household members with mental illness	0.0200***	0.0141***	0.00271	0.00366	0.0303***
	(0.00474)	(0.00511)	(0.00487)	(0.00266)	(0.0111)
Household members with chronic illness	0.0170***	0.0293***	0.0190***	0.0144***	0.0590***
	(0.00572)	(0.00602)	(0.00568)	(0.00334)	(0.0131)
Mashonaland Central	0.0777***	0.0925***	0.136***	-0.0132***	0.298***
	(0.00874)	(0.00770)	(0.00916)	(0.00402)	(0.0186)
Mashonaland East	0.159***	0.0956***	0.166***	-0.00118	0.428***
	(0.00842)	(0.00733)	(0.00891)	(0.00413)	(0.0179)
Mashonaland West	0.120***	0.0917***	0.123***	0.00900*	0.347***
	(0.00897)	(0.00802)	(0.00957)	(0.00461)	(0.0195)
Matabeleland North	0.101***	0.108***	0.133***	0.000598	0.353***
	(0.00902)	(0.00802)	(0.00952)	(0.00440)	(0.0194)
Matabeleland South	0.141***	0.112***	0.0195*	0.00734	0.290***
	(0.00917)	(0.00821)	(0.0100)	(0.00457)	(0.0204)
Midlands	0.0263***	0.0558***	0.0124	-0.0166***	0.0834***
	(0.00830)	(0.00728)	(0.00959)	(0.00393)	(0.0184)
Masvingo	0.109***	0.118***	0.101***	-0.00824*	0.332***
	(0.00914)	(0.00784)	(0.00958)	(0.00421)	(0.0199)
Constant	-0.000141	-0.161***	0.280***	0.0466***	0.113***
	(0.0180)	(0.0162)	(0.0185)	(0.00845)	(0.0390)
Observations	39,253	39,147	39,592	39,126	40,296
R-squared	0.299	0.128	0.115	0.007	0.285

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.5.3 Severity of the impact of economic stressors

The Economic Stress Index (ESI) gives the public and policymakers a broad view of the state of the economy. The higher the number, the worse the economy is. The lower the number, meaning there is less stress, the better the economy is. This section looks at the proportion that listed the aforementioned economic shock effect on their livelihoods as severe.

6.5.3.1 Descriptive analysis of severity of economic stressors

Table 12 reveals a declining economic situation as the ESI significantly increase from 0.349 in 2017 to 1.818 in 2019. The results further show that for those affected by the shock, loss of employment had the highest proportion of the sampled households that listed the shock impact as severe and livestock price change affected the lowest proportion of households. The increase in severity of the economic stressors was statistically valid with a 99% level of confidence. The observed trends in Table 12 are also confirmed by the inferential analysis presented in Table 13. Appendix 7 gives the progression in the severity of economic stressors across the three years under analysis.

Table 12. Descriptive analysis of the severity of economic stressors

Shock & Stress	2017		2018		2019		P-Value
	Mean	S. D	Mean	S. D	Mean	S. D	
Cereal price change	0.370	0.483	0.679	0.467	0.902	0.297	0.000
Livestock price change	0.332	0.472	0.599	0.490	0.866	0.341	0.000
Cash shortage	0.632	0.482	0.809	0.393	0.909	0.288	0.000
Loss of employment	0.670	0.471	0.847	0.360	0.938	0.241	0.000
Economic stressors index [0 - 4]	0.349	0.562	1.037	0.983	1.818	1.039	0.000

6.5.3.2 Inferential analysis of the trends in severity of economic stressors

Table 13 confirms positive year on year and general trends in the severity of all economic shocks at the 1% level of significance. Furthermore, at the 1% significance level, an increase in the age of household head by one year was likely to decrease the severity of the following economic stressors; cereal price change (0.06%), cash shortage (0.06%), loss of employment (0.28%) and Economic stressors index by (0.001 points). Appendix 8 shows the probit estimates of the year on year and general trends in the severity of economic stressors.

Table 13. OLS estimates of year on year and general trends in the severity of the impact of economics stressors

VARIABLES	Cereal price change	Livestock price change	Cash shortage	Loss employment	Economic shocks index [0 - 4]
	(I)	(II)	(III)	(IV)	(V)
Survey year is 2019 [1 if Yes, 0 if No]	0.535***	0.526***	0.277***	0.247***	1.457***
	(0.0137)	(0.0259)	(0.00738)	(0.0274)	(0.0103)
Survey year is 2018 [1 if Yes, 0 if No]	0.315***	0.266***	0.179***	0.170***	0.693***
	(0.0147)	(0.0269)	(0.00787)	(0.0285)	(0.00978)

General Trends	0.247***	0.262***	0.132***	0.120***	0.730***
	(0.00512)	(0.00841)	(0.00336)	(0.0130)	(0.00526)
Household head is female [1 if Yes, 0 if No]	0.00532	0.0145*	0.00137	-0.0211	0.0122
	(0.00564)	(0.00875)	(0.00447)	(0.0175)	(0.0102)
Household head age [Years]	-0.000645***	-0.000283	-0.000566***	-0.00287***	-0.00100***
	(0.000196)	(0.000297)	(0.000162)	(0.000681)	(0.000323)
Married living together	0.0483***	-0.00865	0.0163	0.0695	0.120***
	(0.0180)	(0.0262)	(0.0142)	(0.0560)	(0.0305)
Married living apart	0.0210	-0.0243	-0.0246	0.0485	-0.0172
	(0.0205)	(0.0306)	(0.0164)	(0.0629)	(0.0341)
Divorced/separated	0.0525**	0.00899	0.0397**	0.0662	0.0695**
	(0.0209)	(0.0318)	(0.0166)	(0.0656)	(0.0354)
Widow/widower	0.0618***	0.0153	0.0226	0.110*	0.0629*
	(0.0195)	(0.0289)	(0.0153)	(0.0586)	(0.0326)
Primary level	-0.0185**	-0.00171	-0.0112*	-0.0906***	0.0657***
	(0.00811)	(0.0131)	(0.00668)	(0.0253)	(0.0128)
ZJC	-0.0161	-0.00304	-0.0214**	-0.0813**	0.104***
	(0.0103)	(0.0162)	(0.00863)	(0.0327)	(0.0171)
O' level	-0.0374***	0.00303	-0.0121	-0.0928***	0.0624***
	(0.00949)	(0.0151)	(0.00768)	(0.0297)	(0.0152)
Diploma/Certificate after secondary	-0.0966***	-0.0148	-0.0761***	-0.123	0.0376
	(0.0348)	(0.0500)	(0.0269)	(0.0953)	(0.0481)
Household members with mental illness	0.0130**	0.0139*	0.0122**	0.0224	0.0454***
	(0.00534)	(0.00810)	(0.00474)	(0.0155)	(0.0110)
Household members with chronic illness	0.00461	0.0249***	0.00140	0.0313*	0.0525***
	(0.00653)	(0.00937)	(0.00564)	(0.0168)	(0.0129)
Mashonaland Central	-0.0371***	-0.0300	-0.0130	-0.0968**	0.212***
	(0.0120)	(0.0196)	(0.00889)	(0.0381)	(0.0177)
Mashonaland East	-0.00515	-0.0172	-0.0286***	-0.0361	0.315***
	(0.0112)	(0.0186)	(0.00876)	(0.0324)	(0.0173)
Mashonaland West	-0.0282**	-0.0152	-0.0706***	-0.0836**	0.210***
	(0.0119)	(0.0196)	(0.00971)	(0.0328)	(0.0188)
Matabeleland North	0.0148	0.0390**	0.0137	0.0256	0.311***
	(0.0116)	(0.0184)	(0.00897)	(0.0332)	(0.0184)
Matabeleland South	-0.0225*	-0.0463**	-0.0302***	-0.126***	0.161***
	(0.0121)	(0.0198)	(0.0101)	(0.0360)	(0.0191)
Midlands	-0.0349***	-0.0584***	-0.0704***	0.0135	0.0313*
	(0.0119)	(0.0196)	(0.00992)	(0.0346)	(0.0175)
Masvingo	0.0143	0.0405**	-0.00689	0.0274	0.279***
	(0.0120)	(0.0185)	(0.00927)	(0.0302)	(0.0192)
Constant	0.375***	0.367***	0.674***	0.881***	-0.0141
	(0.0262)	(0.0433)	(0.0191)	(0.0744)	(0.0376)
Observations	18,801	9,139	27,072	1,634	40,296
R-squared	0.151	0.132	0.076	0.106	0.314

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.6 Social related stressors

Social stress can be broadly defined as a situation which threatens one's relationships, esteem, or sense of belonging within a group or larger social context[23]. Social stress can stem from difficult social interactions, for example, a conflictual or tumultuous marital or

[23] Juth V., Dickerson S. (2013) Social Stress. In: Gellman M.D., Turner J.R. (eds) Encyclopedia of Behavioural Medicine. Springer, New York, NY. https://doi.org/10.1007/978-1-4419-1005-9_283

family relationship[9]. Social stress can also emerge in the context of evaluated performance situations, where others could be judgmental or critical, or in contexts in which one feels rejected, ostracized, or ignored.

6.6.1 Incidence of social stressors

6.6.1.1 Descriptive analysis of incidence of social stressors

The results presented in Table 14 show an increase in the incidence of social conflict in the sampled households from 2.4% in 2017 to 4.2% in 2018. However, there was a decrease in the incidences of social conflict from 4.2% in 2018 to 2.2% in 2019. The mean differences were statistically valid with a 99% level of confidence.

Table 14. Descriptive analysis of the incidence of social stressors

Year	Variable	Mean	S. D
2019	Social conflict	0.022	0.147
2018	Social conflict	0.042	0.200
2017	Social conflict	0.024	0.153
	P - Value	0.000	

6.6.1.2 Inferential analysis of the trends on incidence of social stressors

Inferential analysis presented in Table 15 reveals that the increase in the incidences of social conflict between 2017 and 2018 was statistically significant at the 1% level of significance and the decrease between 2018 and 2019 was significant at 5% level of significance. Furthermore, the table denotes a declining general trend in the incidences of social stressors at the 1% level of significance.

Table 15 further shows that at the 1% level of significance, an increase in the age of the household head by one year decreased the incidence of social conflict by 0.53%. More so, the results show that at the 1% level of significance, female headed households were 0.53% more likely to experience social conflict as compared to male headed households.

Table 15. OLS and probit estimates of year on year and general trends in social stressors

VARIABLES	OLS (I)	Probit (II)
Survey year is 2019 [1 if Yes, 0 if No]	-0.00394**	-0.0719**
	(0.00200)	(0.0366)
Survey year is 2018 [1 if Yes, 0 if No]	0.0174***	0.242***

	(0.00225)	(0.0334)
General trends	-0.00302***	-0.0489***
	(0.000998)	(0.0152)
Household head is female [1 if Yes, 0 if No]	0.00532***	0.0801***
	(0.00181)	(0.0287)
Household head age [Years]	-0.000276***	-0.00411***
	(5.90e-05)	(0.000948)
Household members with chronic illness	0.00797***	0.102***
	(0.00272)	(0.0319)
Mashonaland Central	-0.0121***	-0.268***
	(0.00284)	(0.0623)
Mashonaland West	0.0225***	0.291***
	(0.00395)	(0.0516)
Midlands	0.00614*	0.105*
	(0.00337)	(0.0535)
Masvingo	0.0228***	0.296***
	(0.00389)	(0.0514)
Constant	0.0267***	-1.951***
	(0.00714)	(0.106)
Observations	39,157	39,157
R-squared	0.009	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.6.2 Severity of social conflict shocks

6.6.2.1 Descriptive analysis of severity of social conflict shocks

Table 16 indicates a decrease in the severity of social conflict between 2017 (0.0556) and 2018 (0.440) and then an increase from 0.440 in 2018 to 0.608 in 2019. Both the decrease and increase were not statistically significant.

Table 16. Severity of social conflict shocks

Year	Variable	Mean	S. D
2017	Social conflict	0.556	0.498
2018	Social conflict	0.440	0.497
2019	Social conflict	0.608	0.489
	P-value	0.935	

6.3.2.2 Inferential analysis of trends in severity of social conflict

The results of the inferential analysis presented Table 17 show that the decrease in severity of social conflict between 2017 and 2018 was statistically significant at the 1% level of significance. In addition, the results indicate that at the 5% level of significance, social

conflict was higher in households headed by divorced/separated persons and for households located in Mashonaland Central and Mashonaland West provinces.

Table 17. OLS and Probit estimates of year on year trends in severity of social conflict

VARIABLES	OLS	Probit
	(I)	(II)
Survey year is 2019 [1 if Yes, 0 if No]	0.0396	0.103
	(0.0430)	(0.113)
Survey year is 2018 [1 if Yes, 0 if No]	-0.114***	-0.298***
	(0.0387)	(0.0998)
General trend	0.0290	0.0747
	(0.0215)	(0.0556)
Household head is female [1 if Yes, 0 if No]	-0.00197	-0.0104
	(0.0319)	(0.0832)
Household head age [Years]	0.00124	0.00319
	(0.00109)	(0.00285)
Divorced/separated	0.241**	0.667**
	(0.0974)	(0.269)
Household size	-0.00247	-0.00639
	(0.00660)	(0.0173)
Mashonaland Central	-0.152**	-0.397**
	(0.0751)	(0.198)
Mashonaland East	-0.0582	-0.152
	(0.0626)	(0.163)
Mashonaland West	-0.145**	-0.377**
	(0.0577)	(0.153)
Constant	0.496***	-0.00698
	(0.114)	(0.300)
Observations	1,141	1,141
R-squared	0.055	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.4.3 Incidence of crop and livestock diseases

6.4.3.1 Descriptive analysis of the incidences of crop and livestock diseases

The results presented in

Table 18 show a significant increase in the incidences of crop and livestock shocks for the period under review. In particular, the incidence of livestock diseases increased from 9.3% in 2017 to 24.7% in 2019, livestock deaths increased from 8.6% to 23.5%, crop pests increased from 29.9% to 44.1% and the livestock and crop shock index from 0.446 points in 2017 to

0.918 points in 2019. The increase in all these shocks was statistically valid with a 99% level of confidence. A pictorial representation of the trends in shocks related to crops and livestock is shown in Appendix 10.

Table 18. Descriptive analysis of the incidences of crop and livestock shocks

Type of shock	2017		2018		2019		P - value
	Mean	S. D	Mean	S. D	Mean	S. D	
Livestock diseases	0.093	0.290	0.182	0.386	0.247	0.431	0.000
Livestock deaths	0.086	0.280	0.223	0.416	0.235	0.424	0.000
Crop pests	0.299	0.458	0.447	0.497	0.441	0.496	0.000
Livestock and crop shock index [0 – 3]	0.446	0.685	0.847	0.976	0.918	1.018	0.000

6.4.3.2 Inferential analysis of trends in the incidence of crop and livestock shocks

Table 19 show the results of inferential analysis of the trends in the incidences of crop and livestock shocks. The results reveal that at the 1% level of significance, the year to year increase in the incidence of crop and livestock shocks was significant for the period under review. The positive general trend in all the crop and livestock shocks was also statistically valid at the 1% level of significance.

In addition, the results show that increasing the age of household head by one year increased the probability of an increase in all the crop and livestock shocks. More so, at the 1% level of significance an increase in household size by one member increased the incidences of all the crop and livestock shocks. Furthermore, Table 19 indicates that at the 1% level of significance, the probability for an increase in the incidence of all the crop and livestock shocks was high in all the provinces compared to the base province of Manicaland. Probit estimates of year on year trends in the incidences of crop and livestock related shocks are shown in Appendix 11.

Table 19. OLS estimates of year on year and general trends in the incidences of crop and livestock shocks

VARIABLES	Livestock diseases	Livestock deaths	Crop pests	Livestock and crop shock index [0 – 3]
	(I)	(III)	(IV)	(V)
Survey year is 2019 [1 if Yes, 0 if No]	0.161***	0.156***	0.150***	0.497***
	(0.00463)	(0.00455)	(0.00602)	(0.0106)
Survey year is 2018 [1 if Yes, 0 if No]	0.0953***	0.145***	0.160***	0.427***
	(0.00432)	(0.00445)	(0.00600)	(0.0103)
General trend	0.0798***	0.0744***	0.0710***	0.242***

	(0.00235)	(0.00232)	(0.00301)	(0.00538)
Household head is female [1 if Yes, 0 if No]	-0.00198	-0.00183	-0.00937*	-0.0106
	(0.00421)	(0.00427)	(0.00509)	(0.00989)
Household head age [Years]	0.00217***	0.00217***	0.00106***	0.00533***
	(0.000137)	(0.000140)	(0.000169)	(0.000320)
Married living together	0.00380	-0.0271**	0.0477***	0.0271
	(0.0110)	(0.0123)	(0.0143)	(0.0277)
Married living apart	-0.00755	-0.0189	0.0165	-0.00747
	(0.0125)	(0.0138)	(0.0161)	(0.0311)
Divorced/separated	-0.0448***	-0.0778***	-0.0408**	-0.156***
	(0.0127)	(0.0139)	(0.0169)	(0.0318)
Widow/widower	-0.0218*	-0.0422***	0.0278*	-0.0310
	(0.0121)	(0.0133)	(0.0154)	(0.0299)
Primary level	0.0365***	0.0299***	0.0271***	0.0916***
	(0.00559)	(0.00575)	(0.00696)	(0.0132)
ZJC	0.0491***	0.0424***	0.0469***	0.134***
	(0.00736)	(0.00751)	(0.00913)	(0.0173)
O' level	0.0435***	0.0375***	0.0285***	0.106***
	(0.00647)	(0.00660)	(0.00817)	(0.0153)
A' level	0.0384*	0.0404*	0.0381	0.102**
	(0.0210)	(0.0217)	(0.0277)	(0.0517)
Diploma/Certificate after primary	0.0644*	0.0510	-0.0476	0.0740
	(0.0341)	(0.0335)	(0.0377)	(0.0764)
Diploma/Certificate after secondary	0.0369*	0.0192	-0.00905	0.0408
	(0.0196)	(0.0199)	(0.0246)	(0.0474)
Graduate/Post-Graduate	0.00518	-0.00389	-0.0954***	-0.0908
	(0.0270)	(0.0286)	(0.0332)	(0.0681)
Household size	0.0114***	0.0131***	0.0204***	0.0447***
	(0.000942)	(0.000971)	(0.00113)	(0.00219)
Household members with mental illness	0.00502	0.0114**	0.00440	0.0109
	(0.00489)	(0.00503)	(0.00566)	(0.0113)
Household members with chronic illness	0.0365***	0.0350***	0.0225***	0.0755***
	(0.00585)	(0.00603)	(0.00654)	(0.0131)
Mashonaland Central	0.0656***	0.0452***	0.237***	0.344***
	(0.00717)	(0.00747)	(0.00949)	(0.0171)
Mashonaland East	0.0538***	0.0294***	0.0899***	0.176***
	(0.00678)	(0.00707)	(0.00894)	(0.0160)
Mashonaland West	0.0845***	0.0469***	0.141***	0.271***
	(0.00758)	(0.00773)	(0.00975)	(0.0179)
Matabeleland North	0.0827***	0.0609***	0.0546***	0.203***
	(0.00775)	(0.00797)	(0.00974)	(0.0182)
Matabeleland South	0.0350***	0.0818***	-0.00961	0.113***
	(0.00735)	(0.00814)	(0.00943)	(0.0176)
Midlands	0.0650***	0.0310***	0.163***	0.256***
	(0.00723)	(0.00745)	(0.00945)	(0.0172)
Masvingo	0.108***	0.0788***	0.286***	0.477***
	(0.00775)	(0.00798)	(0.00962)	(0.0182)
Constant	-0.167***	-0.136***	-0.0380**	-0.368***
	(0.0144)	(0.0154)	(0.0183)	(0.0347)
Observations	39,302	39,180	39,474	40,296
R-squared	0.050	0.050	0.075	0.094

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.4.4 Severity of crop and livestock diseases

6.4.4.1 Descriptive analysis of the severity of crop and livestock diseases

Regarding the severity of the incidence of shocks presented in

Table 18, Table 20 shows that the severity of all the crop and livestock shocks significantly increased during the period under review. The increase was statistically valid with a 99% level of confidence. A pictorial representation of the severity of crop and livestock related shocks is shown in Appendix 13 of this study.

Table 20. Descriptive analysis of the severity of crop and livestock shocks

Shock	Mean	D. S	Mean	S. D	Mean	S. D	P - Value
Livestock disease	0.490	0.500	0.527	0.499	0.695	0.461	0.000
Livestock deaths	0.472	0.499	0.602	0.490	0.692	0.462	0.000
Crop pests	0.487	0.500	0.630	0.483	0.704	0.456	0.000
Livestock and crop shock index [0 – 3]	0.211	0.488	0.509	0.795	0.642	0.886	0.000

6.4.4.2 Inferential analysis of trends in the severity of crop and livestock shocks

The inferential analysis results presented in Table 21 indicate that compared to the base year of 2017, the severity of all livestock and crop shocks in 2019 increased at the 1% level of significance. Furthermore, compared to the base year of 2017, the shock severity in 2018 was also more severe. The general trend in the severity of crop and livestock shocks was positive at the 1% level of significance.

The table further shows that an increase in the age of household head by one year decreased the severity of crop pests by 0.13%. At the 1% level of significance, except for Matabeleland South, households in all the other provinces were likely to experience an increase in the severity of livestock and crop shock index than the base province of Manicaland. Probit estimates of the year on year trends in the severity of crop and livestock related shocks is shown in Appendix 13 and those for the general trends are shown in Appendix 15.

Table 21. OLS estimates of year on year trend in the severity of crop and livestock shocks

VARIABLES	Livestock diseases	Livestock deaths	Crop pests	Livestock and crop shock index [0 – 3]

	(I)	(II)	(III)	(IV)
Survey year is 2019 [1 if Yes, 0 if No]	0.198***	0.216***	0.213***	0.443***
	(0.0185)	(0.0192)	(0.0108)	(0.00874)
Survey year is 2018 [1 if Yes, 0 if No]	0.0335*	0.126***	0.149***	0.313***
	(0.0193)	(0.0194)	(0.0108)	(0.00808)
General trend	0.117***	0.102***	0.101***	0.218***
	(0.00842)	(0.00848)	(0.00524)	(0.00445)
Household head is female [1 if Yes, 0 if No]	0.00957	0.0145	0.00428	0.000169
	(0.0117)	(0.0114)	(0.00785)	(0.00842)
Household head age [Years]	-0.000860**	0.000122	-0.00132***	0.00275***
	(0.000406)	(0.000396)	(0.000270)	(0.000267)
Married living together	0.0709*	0.108***	-0.00406	0.0372*
	(0.0420)	(0.0374)	(0.0272)	(0.0220)
Married living apart	0.0691	0.0827**	-0.0614**	-0.0103
	(0.0470)	(0.0417)	(0.0303)	(0.0248)
Divorced/separated	0.0399	0.110**	-0.0339	-0.0917***
	(0.0515)	(0.0467)	(0.0328)	(0.0254)
Widow/widower	0.0620	0.0655*	-0.0223	-0.0167
	(0.0443)	(0.0396)	(0.0289)	(0.0239)
Primary level	-0.00716	-0.0428***	-0.0491***	0.0298***
	(0.0167)	(0.0158)	(0.0109)	(0.0110)
ZJC	-0.0358*	-0.0630***	-0.0804***	0.0336**
	(0.0215)	(0.0206)	(0.0141)	(0.0145)
O' level	-0.0283	-0.0851***	-0.0845***	0.0124
	(0.0198)	(0.0191)	(0.0127)	(0.0127)
A' level	-0.0549	-0.00314	-0.0669	0.0296
	(0.0668)	(0.0642)	(0.0432)	(0.0424)
Diploma/Certificate after primary	-0.133	-0.156*	-0.104	-0.0481
	(0.0941)	(0.0930)	(0.0733)	(0.0540)
Diploma/Certificate after secondary	-0.126**	-0.143**	-0.190***	-0.102***
	(0.0612)	(0.0644)	(0.0419)	(0.0363)
Graduate/Post-Graduate	0.182**	0.000244	-0.0626	-0.0604
	(0.0901)	(0.0947)	(0.0721)	(0.0600)
Household size	-6.69e-05	-0.00270	0.00366**	0.0286***
	(0.00255)	(0.00246)	(0.00174)	(0.00184)
Household members with mental illness	0.0247**	0.00352	0.00213	0.0156
	(0.0111)	(0.0112)	(0.00811)	(0.00970)
Household members with chronic illness	0.00962	0.0437***	0.0203**	0.0669***
	(0.0126)	(0.0119)	(0.00905)	(0.0113)
Mashonaland Central	-0.0618**	0.00152	-0.0984***	0.173***
	(0.0260)	(0.0249)	(0.0158)	(0.0143)
Mashonaland East	-0.0606**	0.0490**	-0.138***	0.0741***
	(0.0255)	(0.0244)	(0.0165)	(0.0132)
Mashonaland West	-0.0519**	0.0226	-0.159***	0.115***
	(0.0259)	(0.0254)	(0.0171)	(0.0150)
Matabeleland North	-0.0750***	0.0112	-0.0994***	0.0702***
	(0.0258)	(0.0249)	(0.0182)	(0.0148)
Matabeleland South	-0.108***	-0.0248	-0.0456**	0.0218
	(0.0279)	(0.0246)	(0.0188)	(0.0144)
Midlands	-0.0806***	0.00647	-0.00863	0.166***
	(0.0256)	(0.0250)	(0.0157)	(0.0144)
Masvingo	-0.0553**	0.0396	0.00428	0.322***

	(0.0254)	(0.0244)	(0.0156)	(0.0158)
Constant	0.542***	0.410***	0.664***	-0.232***
	(0.0538)	(0.0501)	(0.0349)	(0.0283)
Observations	7,146	7,459	15,921	40,296
R-squared	0.040	0.032	0.048	0.083

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.5 Health related shocks

6.5.2 Descriptive analysis of the incidences of health-related shocks

Overall, the results presented in Table 22 reveal a significant increase, at the 99% confidence level, in all health-related shocks from 2017 to 2018 and then a significant decrease from 2018 to 2019. The health-related shocks index shows the same trend, increasing from 0.259 in 2017 to 0.422 in 2018 and a decrease to 0.319 in 2019. A pictorial presentation of the trends in the incidences of health-related shocks is shown in Appendix 16 of this study.

Table 22. Descriptive analysis of the incidences of health-related shocks

Shock	2017		2018		2019		P - Value
	Mean	D. S	Mean	S. D	Mean	S. D	
Death of breadwinner	0.029	0.167	0.047	0.213	0.028	0.164	0.000
HIV/AIDS	0.052	0.221	0.103	0.303	0.089	0.285	0.000
Diarrheal diseases	0.030	0.170	0.075	0.263	0.062	0.241	0.000
Malaria	0.049	0.215	0.106	0.308	0.072	0.259	0.000
Any other health related	0.124	0.330	0.093	0.290	0.069	0.253	0.000
Health related shocks [0 - 5]	0.259	0.532	0.422	0.725	0.319	0.596	0.000

6.5.3 Inferential analysis of year on year and general trends in the incidences of health-related shocks

Table 23 shows that the year to year and general trends in the incidence HIV/AIDS, diarrheal diseases, and malarial diseases had been increasing in the period under analysis. On the other hand, there was a general decline in the incidences of any other health related diseases shocks at the 1% level of significance.

The results also show that households headed by older persons were likely to experience reduced incidences of diarrheal diseases by 0.09%, reduced incidences of malaria disease by 0.01% and likely to experience an increase in health-related shocks by 0.21%. In addition,

the results reveal that at the 1% level of significance, increasing household size by one member was likely to increase the incidence of HIV/AIDS by 0.2%, diarrheal diseases by 0.14% and health related morbidity by 0.37%. **Table 23** also shows that households with chronically ill members had an increased propensity for incidences of all health-related shocks. Probit estimates of the general trend in the mortality and morbidity trends are shown in **Appendix 18** of this study.

Table 23. OLS estimates of year on year and general trends in the incidences of health-related shocks

VARIABLES	Death breadwinner	HIV/AIDS	Diarrheal diseases	Malaria diseases	Health related	Health related shocks [0 - 5]
	(I)	(II)	(III)	(IV)	(V)	(VI)
Survey year is 2019 [1 if Yes, 0 if No]	-0.000709	0.0352***	0.0264***	0.0197***	-0.0527***	0.0578***
	(0.00230)	(0.00335)	(0.00265)	(0.00303)	(0.00392)	(0.00723)
Survey year is 2018 [1 if Yes, 0 if No]	0.0171***	0.0503***	0.0438***	0.0580***	-0.0320***	0.164***
	(0.00237)	(0.00336)	(0.00277)	(0.00332)	(0.00402)	(0.00778)
General trend	-0.00132	0.0158***	0.0115***	0.00725***	-0.0261***	0.0239***
	(0.00116)	(0.00170)	(0.00135)	(0.00153)	(0.00193)	(0.00364)
Household head is female [1 if Yes, 0 if No]	0.00114	-0.000280	0.00601**	0.00304	0.00252	0.0124*
	(0.00211)	(0.00309)	(0.00251)	(0.00277)	(0.00300)	(0.00666)
Household head age [Years]	-0.000123*	-5.11e-05	-0.000945***	-0.00104***	0.00217***	8.98e-05
	(6.76e-05)	(9.55e-05)	(8.22e-05)	(9.20e-05)	(0.000110)	(0.000220)
Married living together	-0.0397***	-0.0195**	0.0205***	0.0182**	-0.0408***	-0.0595***
	(0.00726)	(0.00934)	(0.00686)	(0.00776)	(0.00862)	(0.0212)
Married living apart	-0.0302***	-0.0199*	0.00799	0.000483	-0.0390***	-0.0792***
	(0.00772)	(0.0102)	(0.00760)	(0.00848)	(0.00948)	(0.0228)
Divorced/separated	-0.0138	0.0253**	0.0151*	0.00451	-0.0404***	-0.00869
	(0.00841)	(0.0114)	(0.00835)	(0.00931)	(0.0102)	(0.0252)
Widow/widower	0.0445***	0.0314***	0.0131*	-0.00244	-0.0355***	0.0508**
	(0.00829)	(0.0104)	(0.00734)	(0.00822)	(0.00965)	(0.0232)
Primary level	0.00443	0.0132***	-0.0129***	-0.0170***	0.0158***	0.00261
	(0.00306)	(0.00425)	(0.00347)	(0.00394)	(0.00462)	(0.00956)
ZJC	0.00825**	0.0172***	-0.0208***	-0.0215***	0.0168***	-0.00151
	(0.00369)	(0.00550)	(0.00454)	(0.00525)	(0.00572)	(0.0122)
O' level	-0.000105	0.00439	-0.0278***	-0.0447***	0.0108**	-0.0579***
	(0.00317)	(0.00480)	(0.00418)	(0.00470)	(0.00503)	(0.0108)
A' level	0.00234	-0.00770	-0.0234*	-0.0580***	0.00399	-0.0850***
	(0.00872)	(0.0136)	(0.0142)	(0.0141)	(0.0141)	(0.0310)
Diploma/Certificate after primary	0.0222	-0.00301	-0.00620	-0.00701	0.0640**	0.0746

	(0.0171)	(0.0202)	(0.0183)	(0.0213)	(0.0297)	(0.0605)
Diploma/Certificate after secondary	-0.00736	-0.0303***	-0.0316***	-0.0566***	0.00532	-0.121***
	(0.00699)	(0.0101)	(0.0108)	(0.0112)	(0.0145)	(0.0269)
Graduate/Post-Graduate	-0.00703	-0.0125	-0.0423***	-0.0664***	0.0376	-0.0898**
	(0.00888)	(0.0173)	(0.0132)	(0.0148)	(0.0243)	(0.0406)
Household size	-0.000367	0.00298***	0.00140***	0.00370***	0.00106	0.00899***
	(0.000467)	(0.000679)	(0.000541)	(0.000605)	(0.000742)	(0.00149)
Household members with mental illness	0.00368	-0.00621*	0.000294	0.00554	-0.000648	-0.0108
	(0.00228)	(0.00375)	(0.00313)	(0.00355)	(0.00420)	(0.00845)
Household members with chronic illness	0.00887***	0.0645***	0.0329***	0.0263***	0.0732***	0.179***
	(0.00285)	(0.00528)	(0.00421)	(0.00448)	(0.00562)	(0.0110)
Mashonaland Central	0.00405	0.0156***	0.0451***	0.100***	0.00954	0.169***
	(0.00343)	(0.00507)	(0.00518)	(0.00645)	(0.00588)	(0.0126)
Mashonaland East	0.00535	0.0149***	0.00569	0.0336***	-0.00656	0.0532***
	(0.00340)	(0.00484)	(0.00428)	(0.00540)	(0.00556)	(0.0114)
Mashonaland West	0.0154***	0.0363***	0.0542***	0.0207***	0.0170***	0.141***
	(0.00385)	(0.00558)	(0.00557)	(0.00573)	(0.00627)	(0.0133)
Matabeleland North	0.00679*	0.0449***	-0.0197***	-0.0351***	-0.0153**	-0.0143
	(0.00377)	(0.00574)	(0.00407)	(0.00473)	(0.00599)	(0.0120)
Matabeleland South	0.00610	0.0453***	-0.0175***	-0.0487***	-0.0202***	-0.0318***
	(0.00390)	(0.00580)	(0.00410)	(0.00441)	(0.00593)	(0.0121)
Midlands	0.00647*	0.00883*	-0.00712*	-0.0347***	-0.00754	-0.0300***
	(0.00357)	(0.00499)	(0.00424)	(0.00459)	(0.00585)	(0.0110)
Masvingo	0.00170	0.0383***	0.0212***	0.0223***	0.00453	0.0931***
	(0.00359)	(0.00558)	(0.00488)	(0.00563)	(0.00615)	(0.0125)
Constant	0.0451***	0.00787	0.0538***	0.0802***	0.0317***	0.188***
	(0.00861)	(0.0114)	(0.00897)	(0.0102)	(0.0117)	(0.0261)
Observations	39,112	39,140	39,100	39,157	39,220	40,296
R-squared	0.036	0.025	0.027	0.047	0.036	0.048

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.6 Impact severity of health-related shocks

6.7.5 Descriptive analysis of the severity of health-related shocks

Table 24 shows the severity of the health-related shocks over the period under review. The results reveal a significant increase in the proportion of households that experienced severe shock of death of the breadwinner for the period under review. In addition, the results indicate a significant increase in the severity index for health-related shocks from 0.136 in 2017 to 0.207 in 2018 and a significant decrease to 0.160 in 2019. A pictorial representation of the trends in the severity of the health-related shocks is shown in Appendix 19.

Table 24. Descriptive analysis of the severity of health-related shocks

Shock	Mean	D. S	Mean	S. D	Mean	S. D	P - Value
Death of breadwinner	0.715	0.452	0.893	0.309	0.957	0.204	0.000
HIV/AIDS	0.601	0.490	0.539	0.499	0.501	0.500	0.851
Diarrheal diseases	0.410	0.493	0.271	0.445	0.382	0.486	0.080
Malaria	0.420	0.494	0.395	0.489	0.426	0.495	0.910
Any other health related	0.554	0.497	0.522	0.500	0.507	0.500	0.975
Health related shocks [0 - 5]	0.136	0.388	0.207	0.525	0.160	0.437	0.000

6.7.6 Inferential analysis of year on year and the general trends in the incidences of health-related shocks

Table 25 shows the results of inferential analysis of year on year and the general trends in the incidences of health-related shocks. The results reveal that at the 1% level of significance, the impact of the death of the breadwinner increases by 16.8% between 2017 and 2018 and by 21.2% points between 2017 and 2019. A similar trend was observed for household morbidity as it increased by 7% between 2017 and 2018 and by 2% between 2018 and 2019. Furthermore,

Table 25 shows a significant decrease at the 1% level of significance on the impact of HIV/AIDS by 9% between 2018 and 2019. The results also reveal that households with chronic ill members had an increased propensity to experience severe impact due to the death of breadwinner, health related shocks and household morbidity, *ceteris paribus*. Probit estimates of the year on year trends in the severity of health-related shocks are shown in **Appendix 20** and those for the general trends in the morbidity are shown in **Appendix 21**.

Table 25. OLS estimates of year on year and the general trends in the severity of health related shocks

VARIABLES	Death breadwinner impact	HIV/AIDS impact	Diarrheal disease impact	Malaria Diseases impact	Health related impact	HH morbidity severity
	(I)	(II)	(III)	(IV)	(V)	(VI)
Survey year is 2019 [1 if Yes, 0 if No]	0.212***	-0.0996***	-0.0134	0.0441	-0.0495**	0.0227***
	(0.0292)	(0.0260)	(0.0342)	(0.0290)	(0.0221)	(0.00536)
Survey year is 2018 [1 if Yes, 0 if No]	0.168***	-0.0648**	-0.109***	0.00469	-0.0320	0.0705***
	(0.0285)	(0.0254)	(0.0329)	(0.0269)	(0.0201)	(0.00567)
General trend	0.106***	-0.0468***	0.0220	0.0257*	-0.0250**	0.00915***
	(0.0146)	(0.0125)	(0.0158)	(0.0139)	(0.0110)	(0.00270)
Household head is female [1 if Yes, 0 if No]	-0.00235	-0.0127	0.00304	-0.0159	0.00239	0.00327
	(0.0201)	(0.0180)	(0.0212)	(0.0196)	(0.0185)	(0.00500)
Household head age [Years]	0.000337	0.00117*	-0.00109	-0.000642	-0.00163***	1.97e-05
	(0.000565)	(0.000653)	(0.000747)	(0.000677)	(0.000603)	(0.000164)
Married living together	-0.151***	0.00552	0.0678	-0.0251	0.0669	-0.0450***
	(0.0403)	(0.0549)	(0.0639)	(0.0631)	(0.0583)	(0.0156)
Married living apart	-0.148***	0.0435	0.0217	-0.102	0.0830	-0.0516***
	(0.0569)	(0.0633)	(0.0735)	(0.0723)	(0.0667)	(0.0166)
Divorced/separated	-0.102**	0.0775	0.0812	0.0521	0.100	0.0101
	(0.0491)	(0.0616)	(0.0764)	(0.0738)	(0.0689)	(0.0188)
Widow/widower	-0.0283	0.0708	0.0986	-0.0244	0.0684	0.0595***
	(0.0357)	(0.0567)	(0.0696)	(0.0684)	(0.0604)	(0.0172)
Primary level	-0.0328	0.00266	-0.00842	-0.0725***	-0.0786***	-0.00821
	(0.0205)	(0.0243)	(0.0287)	(0.0258)	(0.0220)	(0.00721)
ZJC	-0.0102	0.0186	-0.0150	-0.0960***	-0.0663**	-0.00676
	(0.0301)	(0.0317)	(0.0374)	(0.0325)	(0.0309)	(0.00907)
O' level	-0.0227	-0.00394	-0.0295	-0.0878***	-0.0474*	-0.0357***
	(0.0318)	(0.0298)	(0.0325)	(0.0297)	(0.0286)	(0.00802)
A' level	-0.0322	-0.0690	-0.104	-0.139	-0.132	-0.0620***
	(0.138)	(0.125)	(0.103)	(0.109)	(0.119)	(0.0201)
Diploma/Certificate after primary	-0.0963	0.0237	-0.0389	-0.0154	-0.124	0.0244
	(0.116)	(0.168)	(0.150)	(0.149)	(0.104)	(0.0469)

Diploma/Certificate after secondary	0.0948**	0.0467	-0.253***	-0.364***	-0.224**	-0.100***
	(0.0380)	(0.135)	(0.0641)	(0.0783)	(0.0896)	(0.0170)
Graduate/Post-Graduate	-0.158	-0.156	-0.295***	-0.377**	-0.107	-0.0834***
	(0.380)	(0.169)	(0.0452)	(0.156)	(0.117)	(0.0247)
Household size	0.00141	-0.00965**	0.00338	-0.000513	-0.00903**	0.00243**
	(0.00373)	(0.00407)	(0.00493)	(0.00448)	(0.00363)	(0.00110)
Household members with mental illness	0.00339	-0.00378	0.00906	0.00340	0.0237	-0.00407
	(0.0191)	(0.0182)	(0.0210)	(0.0187)	(0.0161)	(0.00628)
Household members with chronic illness	0.0120	0.0539***	0.0228	0.0410**	0.0464***	0.113***
	(0.0200)	(0.0168)	(0.0210)	(0.0189)	(0.0157)	(0.00841)
Mashonaland Central	0.0357	-0.106***	-0.158***	-0.256***	0.0222	0.0270***
	(0.0361)	(0.0392)	(0.0398)	(0.0337)	(0.0333)	(0.00894)
Mashonaland East	0.0258	-0.109***	-0.0840*	-0.111***	-0.0347	0.00491
	(0.0370)	(0.0380)	(0.0444)	(0.0364)	(0.0335)	(0.00858)
Mashonaland West	-0.0679*	-0.179***	-0.0592	-0.114***	-0.0614*	0.0342***
	(0.0403)	(0.0383)	(0.0416)	(0.0385)	(0.0337)	(0.00987)
Matabeleland North	0.0812**	-0.106***	0.0168	-0.158***	-0.00995	-0.0143
	(0.0342)	(0.0372)	(0.0563)	(0.0490)	(0.0359)	(0.00907)
Matabeleland South	-0.0302	-0.0960***	-0.0216	-0.0166	0.0353	-0.0199**
	(0.0382)	(0.0372)	(0.0558)	(0.0619)	(0.0359)	(0.00923)
Midlands	0.0511	-0.110***	-0.0363	-0.120**	0.0289	-0.0203**
	(0.0352)	(0.0394)	(0.0477)	(0.0474)	(0.0334)	(0.00845)
Masvingo	-0.0195	-0.0908**	0.0159	-0.0787**	0.0422	0.0379***
	(0.0394)	(0.0376)	(0.0447)	(0.0383)	(0.0337)	(0.00945)
Constant	0.784***	0.654***	0.421***	0.653***	0.657***	0.139***
	(0.0599)	(0.0734)	(0.0850)	(0.0791)	(0.0708)	(0.0195)
Observations	1,337	3,279	2,253	3,043	3,598	40,296
R-squared	0.122	0.024	0.039	0.040	0.018	0.029

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

6.8 Climate related shocks

6.8.1 Descriptive analysis of the severity of health-related shocks

The results in

Table 26 show an increase in the incidence of drought during the period under review. In 2017, 32.4% of the sampled households experienced drought and the number increased to 76.1% in 2019. The climate related shock index decreased from 0.831 in 2017 to 0.801 in 2018 and then increased to 0.876 points in 2019. The difference was significant with 99% confidence level. A pictorial representation is shown in Appendix 22.

Table 26. Descriptive analysis of the incidences of climate related shocks

Shock	Mean	D. S	Mean	S. D	Mean	S. D	P - Value
Floods	0.095	0.293	0.021	0.145	0.031	0.172	0.000
Waterlogging	0.427	0.495	0.151	0.358	0.023	0.151	0.000
Hailstorm	0.034	0.181	0.027	0.163	0.022	0.148	0.000
Drought	0.324	0.468	0.547	0.498	0.761	0.427	0.000
Veld fires	0.009	0.092	0.058	0.233	0.043	0.202	0.000
Climate related shocks index [0 - 5]	0.831	0.800	0.801	0.764	0.876	0.578	0.000

6.8.2 Inferential analysis of year on year and the general trends in the incidences of climate-related shocks

The results presented in Table 27 show that at the 1% level of significance, the incidence of floods, waterlogging and hailstorm decreased during the period 2018 to 2019, while the incidence for drought and veld fires increased during the same period. A similar trend was observed for the period 2017 to 2018. The results also indicate that all things being constant, at the 1% level of significance, households in all provinces except for those in Midlands were likely to experience a reduced incidence of floods as compared to the base province of Manicaland. On the other hand, at the 1% level of significance, the incidence of drought was likely to increase in all provinces except for Mashonaland West as compared to the base province of Manicaland, *ceteris paribus*. Probit estimates of the year on year trends are given in Appendix 23 and those for the general trends are presented in Appendix 24.

Table 27. OLS estimates of year on year trend in the incidences of climate related shocks

VARIABLES	Floods	Waterlogging	Hailstorm	Drought	Veld fires	Climate related shocks index [0 - 5]
	(I)	(II)	(III)	(IV)	(V)	(VI)
Survey year is 2019 [1 if Yes, 0 if No]	-0.0653***	-0.400***	-0.0119***	0.441***	0.0323***	0.0497***
	(0.00319)	(0.00491)	(0.00216)	(0.00573)	(0.00193)	(0.00880)
Survey year is 2018 [1 if Yes, 0 if No]	-0.0727***	-0.271***	-0.00626***	0.231***	0.0468***	-0.0219**
	(0.00309)	(0.00555)	(0.00222)	(0.00608)	(0.00215)	(0.00964)
General trend	-0.0305***	-0.197***	-0.00595***	0.220***	0.0145***	0.0266***
	(0.00155)	(0.00237)	(0.00107)	(0.00285)	(0.000999)	(0.00435)
Household head is female [1 if Yes, 0 if No]	0.000938	0.000773	0.00102	-0.00234	-0.00183	0.000190
	(0.00205)	(0.00319)	(0.00171)	(0.00481)	(0.00208)	(0.00713)
Household head age [Years]	-6.31e-06	0.00103***	3.99e-05	0.000259	0.000135**	0.00151***
	(7.40e-05)	(0.000123)	(5.87e-05)	(0.000164)	(6.82e-05)	(0.000250)
Married living together	0.00115	0.0127	0.00290	0.0386***	0.00333	0.0626***
	(0.00627)	(0.00956)	(0.00525)	(0.0149)	(0.00610)	(0.0218)
Married living apart	-0.00649	0.0197*	-0.00309	0.0290*	-0.00522	0.0389
	(0.00697)	(0.0111)	(0.00577)	(0.0167)	(0.00657)	(0.0245)
Divorced/separated	-0.00406	-0.00419	0.00376	0.0263	-0.00636	0.0207
	(0.00735)	(0.0115)	(0.00623)	(0.0175)	(0.00698)	(0.0256)
Widow/widower	-0.00258	0.00546	0.00186	0.0578***	-0.00380	0.0642***
	(0.00682)	(0.0105)	(0.00568)	(0.0159)	(0.00642)	(0.0234)
Primary level	0.000199	0.0165***	0.00374	-0.0108	0.0153***	0.0234**
	(0.00310)	(0.00510)	(0.00228)	(0.00667)	(0.00257)	(0.0101)
ZJC	0.00129	0.0350***	0.0133***	-0.0248***	0.0182***	0.0374***
	(0.00402)	(0.00675)	(0.00329)	(0.00882)	(0.00364)	(0.0135)
O' level	-0.00343	0.0242***	0.00598**	-0.0474***	0.0146***	-0.00811
	(0.00355)	(0.00593)	(0.00271)	(0.00790)	(0.00321)	(0.0120)
A' level	-0.0110	0.0102	0.00175	-0.111***	0.00817	-0.111***
	(0.0109)	(0.0207)	(0.00876)	(0.0282)	(0.0102)	(0.0405)

Diploma/Certificate after primary	0.00309	-0.0393	0.00437	-0.132***	0.0220	-0.130**
	(0.0197)	(0.0295)	(0.0135)	(0.0353)	(0.0158)	(0.0643)
Diploma/Certificate after secondary	-0.0172*	-0.00696	-0.00539	-0.141***	0.0261**	-0.142***
	(0.00931)	(0.0185)	(0.00681)	(0.0249)	(0.0115)	(0.0364)
Graduate/Post-Graduate	0.00180	0.00625	0.00125	-0.138***	0.0335*	-0.103*
	(0.0163)	(0.0268)	(0.0117)	(0.0366)	(0.0174)	(0.0590)
Household size	0.000462	0.00530***	0.000224	0.0141***	-0.000487	0.0199***
	(0.000509)	(0.000857)	(0.000389)	(0.00109)	(0.000449)	(0.00167)
Household members with mental illness	0.00516*	-0.00595	0.00247	0.00100	0.00890***	0.000804
	(0.00280)	(0.00388)	(0.00219)	(0.00525)	(0.00266)	(0.00833)
Household members with chronic illness	0.00541*	0.00933**	0.00410	0.0299***	0.00336	0.0318***
	(0.00323)	(0.00471)	(0.00278)	(0.00612)	(0.00302)	(0.00968)
Mashonaland Central	-0.0569***	-0.0265***	-0.00897***	0.0880***	0.0357***	0.0343***
	(0.00436)	(0.00598)	(0.00264)	(0.00960)	(0.00322)	(0.0130)
Mashonaland East	-0.0560***	0.0663***	0.00510*	0.0662***	0.0429***	0.133***
	(0.00435)	(0.00647)	(0.00300)	(0.00917)	(0.00319)	(0.0132)
Mashonaland West	-0.0457***	0.0440***	0.0182***	0.000635	0.0910***	0.111***
	(0.00470)	(0.00695)	(0.00363)	(0.00953)	(0.00468)	(0.0148)
Matabeleland North	-0.0228***	0.0896***	0.0157***	0.166***	0.0214***	0.282***
	(0.00509)	(0.00692)	(0.00351)	(0.00980)	(0.00289)	(0.0148)
Matabeleland South	-0.0208***	0.0585***	0.0161***	0.191***	0.0179***	0.273***
	(0.00510)	(0.00679)	(0.00353)	(0.00953)	(0.00277)	(0.0143)
Midlands	-0.00988*	0.128***	-0.00269	0.117***	0.0282***	0.268***
	(0.00517)	(0.00715)	(0.00286)	(0.00929)	(0.00298)	(0.0143)
Masvingo	-0.0261***	0.142***	0.00736**	0.0892***	0.00462**	0.233***
	(0.00507)	(0.00752)	(0.00326)	(0.0100)	(0.00217)	(0.0148)
Constant	0.123***	0.258***	0.0163**	0.129***	-0.0398***	0.421***
	(0.00838)	(0.0131)	(0.00635)	(0.0189)	(0.00744)	(0.0278)
Observations	39,222	39,503	39,230	39,451	39,141	40,296
R-squared	0.033	0.203	0.005	0.151	0.030	0.036

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.9 Severity of climate related shocks

6.9.1 Descriptive analysis of the severity of climate-related shocks

The results in Table 28 reveal a significant increase in severity of drought at the 99% level of confidence from 68.3% in 2017 to 88.4% in 2019. Similarly, at the 99% level of confidence, the results indicated an increase of the climate related shocks index from 0.498 in 2017 to 0.738. A pictorial representation of the severity is given in Appendix 25.

Table 28. Descriptive analysis of the severity of climate related shocks

Shock	Mean	D. S	Mean	S. D	Mean	S. D	P - Value
Floods	0.564	0.496	0.563	0.497	0.617	0.487	0.879
Waterlogging	0.580	0.494	0.582	0.493	0.590	0.492	0.998
Hailstorm	0.480	0.500	0.364	0.482	0.473	0.500	0.707
Drought	0.683	0.465	0.725	0.447	0.884	0.320	0.000
Veld fires	0.505	0.503	0.384	0.487	0.595	0.491	0.905
Climate related shocks index [0 - 5]	0.498	0.681	0.526	0.653	0.738	0.553	0.000

6.9.2 Inferential analysis of year on year and the general trends in the severity of climate related shocks

Table 29 presents inferential analysis results for the trends in the severity of climate related shocks. The results reveal a significant increase in the impact of drought by 20% and an increase in household climate severity index by 24.2% between 2018 and 2019, at the 1% level of significance. The results also show that at the 1% level of significance, the impact/severity of drought increased by 4.17% between 2017 and 2018 and household climate severity index increased by 3.54% during the same period. Overall, the general trend during the three-year period under review indicates that the impact of drought, veld fires and household climate severity index increased at the 1% level of significance.

The results in Column (IV) reveal that at the 1% level of significance, the severity of drought was 1.58% higher in female headed households as compared to male headed households, *ceteris paribus*. This result is similar to other findings in literature that female-headed households in Southern Africa are more affected by variation in rainfall than households with adults of both genders[24,25,26].

[24] Kairiza and Kembo (2019). Coping with food and nutrition insecurity in Zimbabwe: does household head gender matter?. *Agric Econ* **7**, 24. https://doi.org/10.1186/s40100-019-0144-6
[25] Rob Fuller & Jonathan Lain (2020) Are female-headed households less resilient? Evidence from Oxfam's impact evaluations, Climate and Development, 12:5, 420-435, DOI: 10.1080/17565529.2019.1637330
[26] Flatø et al. (2017). Women, Weather, and Woes: The Triangular Dynamics of Female-Headed Households, Economic Vulnerability, and Climate Variability in South Africa. Women, Weather, and Woes: World Development Volume 90, February 2017, Pages 41-62. https://doi.org/10.1016/j.worlddev.2016.08.015

The results in Column (IV) and Column (V) of **Table 29** also show that households headed by older persons, widow/widowers, divorced/separated and large size households were more likely to be severely affected by drought and to have a higher household climate severity index as compared to their counterparts. Probit estimates of the year on year and general trends in the impact and severity of climate related shocks are shown in **Appendix 26** and those for the general trends are shown in **Appendix 27**.

Table 29. OLS estimates of year on year trends in the severity of climate related shocks

VARIABLES	Floods impact	Waterloggin g impact	Hailstorm impact	Drought impact	Veld fires impact	Climate related shocks index [0 - 5]
	(I)	(II)	(III)	(IV)	(V)	(VI)
Survey year is 2019 [1 if Yes, 0 if No]	-0.0597	0.0158	-0.0152	0.200***	0.131**	0.242***
	(0.0394)	(0.0284)	(0.0412)	(0.00866)	(0.0559)	(0.00777)
Survey year is 2018 [1 if Yes, 0 if No]	-0.00307	0.0101	-0.108***	0.0417***	-0.0930*	0.0354***
	(0.0340)	(0.0134)	(0.0389)	(0.00954)	(0.0551)	(0.00827)
General trends	-0.0242	0.00909	-0.00897	0.113***	0.148***	0.124***
	(0.0182)	(0.0105)	(0.0207)	(0.00384)	(0.0226)	(0.00386)
Household head is female [1 if Yes, 0 if No]	0.00109	0.0160	0.0332	0.0158***	-0.0538**	0.00654
	(0.0277)	(0.0178)	(0.0339)	(0.00520)	(0.0265)	(0.00640)
Household head age [Years]	0.000335	-0.000469	-0.000956	-0.00112***	-0.00129	0.000124
	(0.000837)	(0.000429)	(0.00112)	(0.000188)	(0.000925)	(0.000219)
Married living together	0.0430	0.0211	0.0408	0.0361**	0.0815	0.0694***
	(0.0831)	(0.0490)	(0.0922)	(0.0174)	(0.0867)	(0.0194)
Married living apart	0.00964	0.0340	0.0349	-0.0106	0.0289	0.0310
	(0.0925)	(0.0525)	(0.105)	(0.0198)	(0.101)	(0.0216)
Divorced/separated	0.0541	0.0272	0.0897	0.0532***	0.131	0.0592***
	(0.0983)	(0.0560)	(0.110)	(0.0200)	(0.106)	(0.0229)
Widow/widower	0.0492	0.0234	0.0849	0.0532***	0.108	0.0900***
	(0.0877)	(0.0513)	(0.0989)	(0.0185)	(0.0940)	(0.0208)
Primary level	-0.0243	-0.00950	0.0149	-0.0504***	0.0430	-0.0176**
	(0.0341)	(0.0167)	(0.0485)	(0.00729)	(0.0408)	(0.00898)
ZJC	-0.00968	-0.0267	-0.0129	-0.0596***	0.0165	-0.0243**
	(0.0447)	(0.0219)	(0.0581)	(0.00983)	(0.0491)	(0.0118)
O' level	-0.00130	-0.0280	0.00610	-0.0830***	0.0708	-0.0619***
	(0.0409)	(0.0203)	(0.0561)	(0.00889)	(0.0460)	(0.0106)
A' level	0.0558	-0.0289	-0.170	-0.0366	0.00823	-0.118***
	(0.140)	(0.0712)	(0.163)	(0.0347)	(0.148)	(0.0342)
Diploma/Certificate after primary	-0.252	-0.141	0.0409	-0.181***	-0.0316	-0.224***

	(0.155)	(0.109)	(0.264)	(0.0598)	(0.214)	(0.0473)
Diploma/Certificate after secondary	0.224*	-0.108*	-0.0996	-0.193***	-0.0323	-0.203***
	(0.117)	(0.0632)	(0.214)	(0.0383)	(0.111)	(0.0303)
Graduate/Post-Graduate	0.113	-0.0721	-0.430***	-0.0569	-0.161	-0.154***
	(0.189)	(0.0972)	(0.0609)	(0.0465)	(0.141)	(0.0462)
Household size	0.00104	0.0124***	0.00404	0.00392***	-0.00965	0.0190***
	(0.00547)	(0.00263)	(0.00755)	(0.00124)	(0.00612)	(0.00149)
Household members with mental illness	-0.0316	0.0311**	-0.0111	0.00280	0.0328	0.00512
	(0.0233)	(0.0148)	(0.0331)	(0.00550)	(0.0238)	(0.00724)
Household members with chronic illness	0.0304	-0.0246	0.0102	0.0160**	-0.00367	0.0292***
	(0.0283)	(0.0162)	(0.0345)	(0.00641)	(0.0288)	(0.00837)
Mashonaland Central	-0.115*	-0.0300	0.124	-0.0111	-0.276***	0.0113
	(0.0666)	(0.0329)	(0.0833)	(0.0108)	(0.0818)	(0.0118)
Mashonaland East	-0.270***	-0.106***	0.0179	-0.0354***	-0.184**	0.0358***
	(0.0608)	(0.0269)	(0.0667)	(0.0109)	(0.0809)	(0.0118)
Mashonaland West	-0.159***	-0.0702**	-0.0174	-0.0731***	-0.145*	0.00349
	(0.0615)	(0.0289)	(0.0651)	(0.0119)	(0.0783)	(0.0128)
Matabeleland North	-0.153***	0.0153	-0.0907	-0.00934	-0.224***	0.173***
	(0.0535)	(0.0272)	(0.0671)	(0.0107)	(0.0869)	(0.0130)
Matabeleland South	-0.185***	-0.0376	-0.0468	-0.0312***	0.0358	0.157***
	(0.0503)	(0.0285)	(0.0659)	(0.0109)	(0.0869)	(0.0130)
Midlands	-0.261***	0.0350	-0.0523	-0.0198*	-0.0972	0.166***
	(0.0497)	(0.0257)	(0.0742)	(0.0107)	(0.0834)	(0.0128)
Masvingo	-0.196***	-0.0448*	0.0316	-0.0497***	0.0500	0.104***
	(0.0466)	(0.0261)	(0.0686)	(0.0117)	(0.103)	(0.0132)
Constant	0.699***	0.555***	0.457***	0.752***	0.622***	0.273***
	(0.107)	(0.0595)	(0.130)	(0.0228)	(0.130)	(0.0246)
Observations	1,702	6,989	1,037	22,277	1,503	40,296
R-squared	0.031	0.016	0.031	0.058	0.085	0.054

Robust standard errors in parentheses - *** p<0.01, ** p<0.05, * p<0.1

6.10 Human and Wildlife Conflict

6.10.1 Descriptive analysis of the incidences of human and wildlife conflict shocks

The results presented in Table 30 show a significant increase in human-wildlife conflict between 2017 and 2018 and then a decrease between 2018 and 2019. The increase and decrease in the human-wildlife conflict during the period under review was statistically valid with a 99% level of confidence.

Table 30. Descriptive analysis of the incidences of human and wildlife conflict shocks

Year	Mean	S. D
2017	0.048	0.215
2018	0.107	0.309
2019	0.097	0.296
P - value	0.000	

6.10.2 Inferential analysis of year on year and the general trends in the incidences of human and wildlife conflict

The results of the inferential analysis presented in Table 31 show that at the 1% level of significance, the incidences of human-wildlife conflict increased both on year to year basis and overall for the period under review. Furthermore, the results show that at the 1% level of significance, the incidence of human-wildlife conflict was likely to be 0.2% and 1.34% higher in large size households and households with chronically ill members, respectively.

Table 31. OLS and Probit estimates of year on year and general trends in the incidences of human and wildlife conflict

VARIABLES	OLS	Probit
	(I)	(II)
Survey year is 2019 [1 if Yes, 0 if No]	0.0486***	0.373***
	(0.00327)	(0.0261)
Survey year is 2018 [1 if Yes, 0 if No]	0.0601***	0.438***
	(0.00334)	(0.0258)
General trend	0.0224***	0.153***
	(0.00166)	(0.0113)
Household head is female [1 if Yes, 0 if No]	-0.00459	-0.0324*
	(0.00306)	(0.0197)
Household head age [Years]	2.64e-05	0.000192
	(0.000102)	(0.000650)
Married living together	0.00939	0.0623
	(0.00946)	(0.0576)
Married living apart	0.00153	0.0113
	(0.0105)	(0.0649)

Divorced/separated	-0.0201*	-0.153**
	(0.0106)	(0.0712)
Widow/widower	-0.00823	-0.0512
	(0.0101)	(0.0623)
Primary level	0.00524	0.0326
	(0.00418)	(0.0270)
ZJC	0.00665	0.0421
	(0.00549)	(0.0354)
O' level	-0.00372	-0.0229
	(0.00483)	(0.0321)
A' level	-0.0230*	-0.183
	(0.0137)	(0.120)
Diploma/Certificate after primary	-0.000154	-0.00683
	(0.0225)	(0.156)
Diploma/Certificate after secondary	-0.0111	-0.0779
	(0.0139)	(0.101)
Graduate/Post-Graduate	-2.48e-05	-0.00835
	(0.0216)	(0.141)
Household size	0.00200***	0.0125***
	(0.000681)	(0.00416)
Household members with mental illness	0.00615*	0.0349*
	(0.00365)	(0.0204)
Household members with chronic illness	0.0134***	0.0802***
	(0.00441)	(0.0233)
Mashonaland Central	0.0411***	0.347***
	(0.00486)	(0.0430)
Mashonaland East	-0.00107	-0.0296
	(0.00389)	(0.0461)
Mashonaland West	0.0552***	0.434***
	(0.00529)	(0.0433)
Matabeleland North	0.0745***	0.551***
	(0.00561)	(0.0427)
Matabeleland South	0.105***	0.693***
	(0.00598)	(0.0420)
Midlands	0.0463***	0.379***
	(0.00493)	(0.0426)
Masvingo	0.0686***	0.512***
	(0.00543)	(0.0426)
Constant	-0.0158	-2.170***
	(0.0113)	(0.0784)
Observations	39,222	39,222
R-squared	0.025	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.10.3 Descriptive analysis of the severity of human and wildlife conflict shocks

Table 32 shows the severity of human and wildlife conflict during the three-years under review. The results indicate that at 99% level of confidence, the increase in human and wildlife conflict was not significant before controlling for observed confounders.

Table 32. Descriptive analysis in the severity of human and wildlife conflict shocks

Year	Shock	Mean	S. D
2017	Human wildlife conflict	0.575	0.495
2018	Human wildlife conflict	0.586	0.493
2019	Human wildlife conflict	0.654	0.476
	P - value	0.335	

6.10.4 Inferential analysis of year on year and the general trends in the severity of human and wildlife conflict

The results of inferential analysis presented in Table 33 reveal that at the 1% level of significance, the severity of human and wildlife conflict increased by 9.72% between 2018 and 2019. The general trend for the period under review, shows a significant increase in the severity of human and wildlife conflict at the 99% level of confidence. Furthermore, the results in Table 33 review that at the 1% level of significance, the severity of human and wildlife conflict was likely to be 12.3% and 11.2% more in Matabeleland North and Matabeleland South, respectively, *ceteris paribus*, as compared to the base province of Manicaland.

Table 33. OLS and Probit estimates of year on year trends in the severity of human and wildlife conflict

VARIABLES	OLS	Probit
	(I)	(II)
Survey year is 2019 [1 if Yes, 0 if No]	0.0972***	0.259***
	(0.0271)	(0.0708)
Survey year is 2018 [1 if Yes, 0 if No]	0.0135	0.0367
	(0.0262)	(0.0674)
General trend	0.0563***	0.149***
	(0.0128)	(0.0337)
Household head is female [1 if Yes, 0 if No]	-0.00512	-0.0146
	(0.0174)	(0.0464)
Household head age [Years]	-0.000251	-0.000628
	(0.000592)	(0.00156)
Married living together	-0.000231	0.00199
	(0.0516)	(0.137)
Married living apart	-0.00761	-0.0182

	(0.0584)	(0.155)
Divorced/separated	0.00210	0.00624
	(0.0663)	(0.176)
Widow/widower	0.0100	0.0295
	(0.0558)	(0.149)
Primary level	-0.00377	-0.0106
	(0.0241)	(0.0639)
ZJC	-0.0398	-0.104
	(0.0315)	(0.0824)
O' level	-0.00548	-0.0136
	(0.0288)	(0.0760)
A' level	-0.162	-0.413
	(0.126)	(0.315)
Diploma/Certificate after primary	0.0583	0.179
	(0.125)	(0.362)
Diploma/Certificate after secondary	-0.0319	-0.0814
	(0.0944)	(0.244)
Graduate/Post-Graduate	-0.0923	-0.240
	(0.132)	(0.332)
Household size	0.000560	0.00143
	(0.00391)	(0.0104)
Household members with mental illness	-0.00320	-0.00908
	(0.0174)	(0.0466)
Household members with chronic illness	0.0294	0.0806
	(0.0188)	(0.0522)
Mashonaland Central	0.0490	0.125
	(0.0448)	(0.114)
Mashonaland East	0.00549	0.0154
	(0.0508)	(0.128)
Mashonaland West	0.0400	0.106
	(0.0444)	(0.114)
Matabeleland North	0.123***	0.325***
	(0.0432)	(0.111)
Matabeleland South	0.112***	0.294***
	(0.0421)	(0.109)
Midlands	0.00164	0.00212
	(0.0446)	(0.113)
Masvingo	0.0828*	0.215*
	(0.0437)	(0.112)
Constant	0.519***	0.0380
	(0.0747)	(0.196)
Observations	3,419	3,419
R-squared	0.016	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Chapter Summary

Economic related stressors

- The results show that cash shortage was the most experienced economic stressor throughout the three years under review and the incidence of this stress was increasing at an alarming rate from 46.9%s in 2017 to 81.6% in 2019.
- Inferential analysis results reveal that at the 1% level of significance, an increase in the age of household head by one year decreased the propensity of the household to be affected by cereal price change (0.001 points) and by loss of employment (0.002 points).
- Increasing household size by one member increased the propensity of the household to be affected by all the economic stressors except for loss of employment.
- Households with chronically ill members had an increased likelihood to be affected by all the economic stressors as compared to households without chronically ill members, *ceteris paribus*.
- At the 1% significance level, an increase in the age of the household head by one year was likely to decrease the severity of the following economic stressors; cereal price change (0.06%), cash shortage (0.06%), loss of employment (0.28%) and Economic stressors index by (0.001 points).

Social related stressors

- There was an increase in the incidence of social conflict from 2.4% in 2017 to 4.2% in 2018 and a decrease from 4.2% in 2018 to 2.2% in 2019.
- Increasing the age of household head by one year was likely to decrease the incidence of social conflict by 0.53%.
- At the 1% level of significance, female headed households were 0.53% more likely to experience social conflict as compared to male headed households.

Incidence of crop and livestock diseases

- There was a significant increase in the incidence of livestock diseases from 9.3% in 2017 to 24.7% in 2019, livestock deaths increased from 8.6% to 23.5%, crop pests increased from 29.9% to 44.1% and crop and livestock shock increased from 44.6% in 2017 to 91.8% in 2019.
- At the 1% level of significance, an increase in household size by one member was likely to increase the incidence of crop and livestock diseases.

- At the 1% level of significance, an increase in the age of household head by one year and decreased the severity of crop pests by 0.13%.
- At the 1% level of significance, except for Matabeleland South, households in all the other provinces were likely to experience an increase in livestock and crop shock than the base province of Manicaland.

Health related shocks

- The results reveal a significant increase, at the 99% confidence level, in all health-related shocks from 2017 to 2018 and then a significant decrease from 2018 to 2019.
- Households headed by older persons were likely to experience reduced incidences of diarrheal diseases by 0.09%, reduced incidences of malaria disease by 0.01% and likely to experience an increase in health-related shocks by 0.21%.
- Increasing household size by one member increased the propensity for the incidence of HIV/AIDS by 0.2%, diarrheal diseases by 0.14% and health related morbidity by 0.37%.
- The results reveal that at the 1% level of significance, the impact of the death of the breadwinner increased by 16.8% between 2017 and 2018 and by 21.2% points between 2017 and 2019.

Climate related shocks

- In 2017, 32.4% of the sampled households experienced drought and the number increased to 76.1% in 2019.
- The results reveal a decrease in climate related shock index from 0.831 in 2017 to 0.801 in 2018 and then an increase to 0.876 points in 2019. The difference was significant at the 99% confidence level.
- There was a decrease in the incidence of floods, waterlogging and hailstorm during the period 2018 to 2019, while the incidence for drought, veld fires and household climate increased during the same period, 2018 and 2019.
- The incidence of drought was likely to increase in all provinces except for Mashonaland West as compared to the base province of Manicaland, *ceteris paribus*.
- There was an increase in the severity of drought at the 99% level of confidence from 68.3% in 2017 to 88.4% in 2019.
- The results indicate an increase in climate related shocks index from 0.498 in 2017 to 0.738.

- At the 99% level of confidence, the results indicate an increase in the climate related shocks index from 0.498 in 2017 to 0.738 in 2019.

Human and Wildlife Conflict

- There was a significant increase in human-wildlife conflict between 2017 and 2018 and then a decrease between 2018 and 2019.
- The results show that at the 1% level of significance, the incidence of human-wildlife conflict was likely to be 0.2% and 1.34% higher in large size households and households with chronically ill members, respectively.
- More so, the severity of human and wildlife conflict was likely to be 12.3% and 11.2% more in Matabeleland North and Matabeleland South, respectively, as compared to the base province of Manicaland.

CHAPTER 7

Household resilience capacities

7.5 Introduction

Resilience is defined from a social-ecological perspective as the capacity of socioeconomic systems (e.g., households) to withstand shocks through absorption, adaptation and transformation. Resilience has been applied in various contexts to understand whether and how social and economic systems could become more robust to shocks[27]. According to Béné et al. (2012)[28], resilience is understood as capacity with three key attributes which characterize the set of necessary actions that any system exposed to shocks needs to undertake. The actions include: what needs to be done to help the system absorb a shock when it occurs; what needs to be done to help the system adapt in a way that makes it less exposed to the shock; and what needs to be done for the system to transform so that it is no longer prone to similar shocks. These three attributes correspond to absorptive capacity, adaptive capacity and transformative capacity.

7.6 Absorptive capacity

Absorptive capacity defines the ability of a system to minimize its exposure to shocks, but also having the mechanisms to recover quickly when shocks actualize[29]. This capacity ensures the persistence of system functions, and mostly constitute coping strategies such as harvesting crops early to avoid floods.

7.6.1 Descriptive analysis of absorptive capacity

Table 34 shows an increase in absorptive resilience from 29.2 points in 2017 to 31.3 points in 2018 and then a decrease to 30.9 points in 2019. The increase and decrease in the adsorptive capacities were significant at the 99% level of confidence.

Table 34. Descriptive analysis of absorptive resilience

Year	Mean	S. D
2017	29.248	24.255
2018	31.390	24.652
2019	30.936	23.907
P - value	0.000	

[27] Ansah et al. (2019). Resilience and household food security: a review of concepts, methodological approaches and empirical evidence. *Food Sec.* **11,** 1187–1203. https://doi.org/10.1007/s12571-019-00968-
[28] Béné et al. (2015b). Is resilience a useful concept in the context of food security and nutrition programmes? Some conceptual and practical considerations. *Food Security, 8*, 123–138.
[29] OECD. (2014). *Guidelines for resilience systems analysis*. France: OECD Publishing.

7.6.2 Inferential analysis of general trends in absorptive capacity

Table 35 show inferential analysis results for the trends in absorptive capacity during the three years under review. The results reveal that at the 1% level of significance the absorptive capacity increased by 1.69 points between 2017 and 2018 and increased by 1.627 points between 2017 and 2019. The general trend also indicates that increasing the survey year by one year is associated with an increase in the household absorptive capacity by 0.759 points other things being equal.

In addition, the results show that at the 1% level of significance, increasing the age of household head by one year was more likely to increase the absorptive capacity by 0.122 points and by 0.894 for households with chronically ill members. Except for married couples living separately, all other forms of marital status were likely to reduce the household absorptive capacity. Similarly, increasing household size by one-member increased the propensity to have a reduced absorptive capacity as compared to small size households. The results in **Table 35** also reveal that at the 1% level of significance, households headed by educated persons were more likely to have a higher absorptive capacity as compared to households headed by less educated persons, *ceteris paribus*. Furthermore, at the 1% level of significance, households in Matabeleland North and Mashonaland West were most likely to have a lower absorptive capacity as compared to the base province of Manicaland

Table 35. OLS estimates of trends in household absorptive capacity

VARIABLES	OLS (I)
Survey year is 2019 [1 if Yes, 0 if No]	1.627***
	(0.319)
Survey year is 2018 [1 if Yes, 0 if No]	1.690***
	(0.316)
General trend	0.759***
	(0.159)
Household head is female [1 if Yes, 0 if No]	0.377
	(0.262)
Household head age [Years]	0.122***
	(0.00896)
Married living together	-6.457***
	(0.814)
Married living apart	1.133
	(0.921)
Divorced/separated	-4.043***
	(0.964)
Widow/widower	-2.797***
	(0.879)
Primary level	2.789***
	(0.370)

ZJC	4.053***
	(0.478)
O' level	4.935***
	(0.421)
A' level	6.901***
	(1.367)
Diploma/Certificate after primary	4.951***
	(1.836)
Diploma/Certificate after secondary	6.854***
	(1.182)
Graduate/Post-Graduate	7.878***
	(1.431)
Household size	-0.722***
	(0.0587)
Household members with mental illness	-0.243
	(0.289)
Household members with chronic illness	0.894***
	(0.346)
Mashonaland Central	-0.600
	(0.491)
Mashonaland East	1.944***
	(0.468)
Mashonaland West	-2.028***
	(0.504)
Matabeleland North	-1.452***
	(0.507)
Matabeleland South	1.334***
	(0.512)
Midlands	1.022**
	(0.502)
Masvingo	1.694***
	(0.517)
Constant	28.11***
	(1.030)
Observations	38,692
R-squared	0.029

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

7.7 Adaptive capacity

Adaptive capacity measures *the ability to make informed choices about alternative livelihood strategies based on changing conditions*[30]. Diversification of livelihood activities, use of drought resistant crop varieties, among others are some key adaptive strategies that help households to deal with shocks.

[30] Béné et al. (2012). Resilience: New utopia or new tyranny? Reflection about the potentials and limits of the concept of resilience in relation to vulnerability reduction Programmes. *IDS Working Papers, 2012*, 1–61.

7.7.1 Descriptive analysis of adaptive capacity

The results presented in Table 36 show an increase in adaptive capacity between 2017 and 2019 and then a decrease between 2018 and 2019. The increase and decrease in the adaptive capacities were statistically valid with a 99% level of confidence.

Table 36. Descriptive analysis of adaptive capacity

Year	Mean	S. D
2017	8.051	5.851
2018	8.499	5.912
2019	8.464	5.829
P - value	0.000	

7.7.2 Inferential analysis for the trends in adaptive capacity

The results presented in **Table 37** show positive year on year and general trends in the household adaptive capacities at the 1% level of significance. Furthermore, female headed households were more likely to have a reduced adaptive capacity as compared to male headed households. More so, at the 1% level of significance, the results indicate that increasing the age of household head by one year and increasing family size by one member increased the likelihood of the household to have an increased adaptive capacity, *ceteris paribus*. The results also show that at the 1% level of significance, increasing the educational level of household head increased household adaptive capacity. At the 1% level of significance, households in Mashonaland Central, Mashonaland West, Mashonaland North, Matabeleland South, Midlands and Masvingo provinces were likely to have a lower adaptive capacity than those in the base province of Manicaland.

Table 37. OLS estimates of trends in household adaptive capacity

VARIABLES	OLS (I)
Survey year is 2019 [1 if Yes, 0 if No]	0.423*** (0.0620)
Survey year is 2018 [1 if Yes, 0 if No]	0.702*** (0.0618)
General trend	0.193*** (0.0310)
Household head is female [1 if Yes, 0 if No]	-0.143*** (0.0523)
Household head age [Years]	0.0114*** (0.00168)
Married living together	0.589***

	(0.140)
Married living apart	-0.431***
	(0.155)
Divorced/separated	0.0998
	(0.164)
Widow/widower	0.675***
	(0.154)
Primary level	1.023***
	(0.0695)
ZJC	5.778***
	(0.0954)
O' level	6.530***
	(0.0818)
A' level	6.849***
	(0.278)
Diploma/Certificate after primary	8.319***
	(0.588)
Diploma/Certificate after secondary	7.647***
	(0.245)
Graduate/Post-Graduate	8.893***
	(0.399)
Household size	0.737***
	(0.0136)
Household members with mental illness	-0.223***
	(0.0580)
Household members with chronic illness	0.0757
	(0.0711)
Mashonaland Central	-0.292***
	(0.0976)
Mashonaland East	-0.219**
	(0.0972)
Mashonaland West	-0.372***
	(0.101)
Matabeleland North	-1.507***
	(0.101)
Matabeleland South	-1.377***
	(0.103)
Midlands	-0.462***
	(0.1000)
Masvingo	-0.468***
	(0.102)
Constant	1.012***
	(0.185)
Observations	40,296
R-squared	0.313

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

7.8 Transformative capacity

Transformative capacity refers to the system level conditions that are necessary for changing the basic configuration of the system to create long-term resilience[31]. Adaptive and transformative capacities are necessary for dealing with the primary sources of vulnerability and they involve medium to long-term mechanisms that help vulnerable systems to develop robustness against specific kinds of shocks[32].

7.8.1 Descriptive analysis of transformative capacity

The descriptive results for transformative capacity displayed in Table 38 reveal a sharp decrease in transformative capacity from 23.6 in 2017 to 8.48 in 2018 and then an increase to 14.1 in 2019. The increase and decrease in the transformative capacities were statistically valid with a 99% level of confidence.

Table 38. Descriptive analysis of transformative capacity

Year	Mean	S. D
2017	23.617	42.475
2018	8.484	27.865
2019	14.110	34.813
P - value	0.000	

7.8.2 Inferential analysis in the trends in transformative capacity

Table 39 point to declining year on year and general trends in the household transformative capacities at the 1% level of significance after controlling for observed confounding variables. Furthermore, at the 1% level of significance, increasing the age of the household head by one year increased household transformative capacity by 0.149 points. More so, the results in Table 39 show that large size households and those with chronically ill persons and members with mental illness had a higher transformative capacity.

Table 39. OLS estimates of trends in household transformative capacity

VARIABLES	OLS (I)
Survey year is 2019 [1 if Yes, 0 if No]	-9.076***
	(0.497)
Survey year is 2018 [1 if Yes, 0 if No]	-14.93***
	(0.458)
General trends	-4.151***

[31] Ansah et al. (2019). Resilience and household food security: a review of concepts, methodological approaches and empirical evidence. *Food Sec.* **11**, 1187–1203 (2019). https://doi.org/10.1007/s12571-019-00968-1

[32] Béné et al. (2012). Resilience: New utopia or new tyranny? Reflection about the potentials and limits of the concept of resilience in relation to vulnerability reduction Programmes. *IDS Working Papers, 2012*, 1–61.

	(0.248)
Household head is female [1 if Yes, 0 if No]	-0.104
	(0.371)
Household head age [Years]	0.149***
	(0.0127)
Married living together	-3.263***
	(1.091)
Married living apart	-3.755***
	(1.211)
Divorced/separated	-1.964
	(1.292)
Widow/widower	-0.734
	(1.198)
Primary level	-2.341***
	(0.546)
ZJC	-1.553**
	(0.674)
O' level	-2.042***
	(0.599)
A' level	-4.097**
	(1.715)
Diploma/Certificate after primary	-4.873*
	(2.842)
Diploma/Certificate after secondary	-5.408***
	(1.559)
Graduate/Post-Graduate	-6.558***
	(2.076)
Household size	0.475***
	(0.0877)
Household members with mental illness	1.997***
	(0.430)
Household members with chronic illness	1.978***
	(0.497)
Mashonaland Central	0.131
	(0.640)
Mashonaland East	-2.658***
	(0.597)
Mashonaland West	-2.669***
	(0.630)
Matabeleland North	7.294***
	(0.749)
Matabeleland South	11.02***
	(0.773)
Midlands	3.323***
	(0.683)
Masvingo	7.270***
	(0.740)
year	
Constant	14.94***
	(1.404)
Observations	40,296
R-squared	0.064

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Chapter Summary

Absorptive capacity

- The results reveal that at the 1% level of significance, the absorptive capacity increased by 1.69 points between 2017 and 2018 and decreased by 1.627 points between 2018 and 2019.
- Increasing the age of household head by one year was more likely to increase household absorptive capacity by 0.122 points and by 0.894 for households with chronically ill members.
- Increasing household size by one-member increased household propensity to have a reduced absorptive capacity as compared to small size households.
- Households headed by educated persons were more likely to have a higher absorptive capacity as compared to households headed by less educated persons, *ceteris paribus*.
- Households in Matabeleland North and Mashonaland West were most likely to have a lower absorptive capacity as compared to the base province of Manicaland.

Adaptive capacity

- The results show an increase in adaptive capacity between 2017 and 2019 and then a decrease between 2018 and 2019.
- Female headed households were more likely to have a reduced adaptive capacity as compared to male headed households.
- At the 1% level of significance, increasing the age of household head by one year and increasing family size by one member increased the likelihood of the household to have an increased adaptive capacity, ceteris paribus.
- At the 1% level of significance, increasing the educational level of household head was likely to increase household adaptive capacity.
- Households in Mashonaland Central, Mashonaland West, Matabeleland North, Matabeleland South, Midlands and Masvingo provinces are likely to have a lower adaptive capacity than those in the base province of Manicaland.

Transformative capacity

- The results reveal a significant decrease in transformative capacity from 23.6 in 2017 to 8.48 in 2018 and then an increase to 14.1 in 2019.
- At the 1% level of significance, increasing the age of household head increased household transformative capacity by 14.9%.
  Large size households and those with chronically or mentally ill members had a higher adaptive capacity.

CHAPTER 8

Resilience and Food and Nutrition Security in The Face of Livelihood Shocks

8.5 Introduction

Available evidence indicates a positive and statistically significant relationship between food consumption, food expenditure or dietary diversity and household resilience. Alinovi et al. (2010)[33] find that a unit increase in the level of resilience is associated with a statistically significant increase of 0.38% in the level of food consumption, controlling for location, gender and household size. Ciani and Romano (2013)[34] interpret this to mean that households with higher initial levels of resilience experience better levels of food security in future when challenged by eventualities. Alfani et al. (2015) find that resilient households often have higher and stable consumption than the non-resilient and chronically poor. d'Errico et al. (2018)[35] find that households with higher resilience capacities in an initial period are less likely to suffer a reduction in per capita calorie intake in a future period even when shocks hit them. Resilience capacity is developed or achieved through the primary causal pathways.

Policy interventions and programmes that target livelihood or welfare outcomes could influence the resilience building strategies, hence resilience capacity (Vaitla et al. 2012; Béné et al. 2017). The economic, legal and political settings within which a household operates could influence the resilience-building strategies. According to Nyahunda & Tirivangasi (2019), the vulnerability of rural households to shocks may be linked closely to socio-economic conditions, which correlate with the people's adaptive capacity. More so, adaptive capacity among rural people is typically limited by poverty, poor public and environmental health, weak institutions, lack of infrastructure and services, marginalisation from decision-making processes and planning procedures, gender inequality, lack of

[33] Alinovi et al. (2010). Livelihoods strategies and household resilience to food insecurity: An empirical analysis to Kenya. In "Conference on "promoting resilience through social protection in sub-Saharan Africa", organised by the European report of development in Dakar, Senegal", pp. 28-30.
[34] Ciani, F., and Romano, D. (2013). Testing for household resilience to food insecurity: Evidence from Nicaragua. Department of Economics and Management.
[35] d'Errico, M., & Di Giuseppe, S. (2018). Resilience mobility in Uganda: A dynamic analysis. World Development, 104, 78-96

education and information, natural disasters, environmental degradation, reliance on rain-fed agriculture and climate-sensitive resources, and insecure tenure[36,37].

8.6 The impact of absorptive capacities on food and nutrition security

8.6.1 Cereal price change shock

Table 40 show the treatment effect of absorptive resilience capacities on food and nutrition security in the face of cereal price change shock. The results reveal that at the 1% level of significance, household absorptive capacity was associated with a decline in the household probability of being in hunger, *ceteris paribus*. For example, Column (I) shows that for the full sample absorptive capacities reduced the probability for a household being in hunger by 0.122 points, increased the probability of the household having an acceptable food consumption score by 14.1% and reduced the probability of it having an unacceptable dietary diversity score by 9.54% at the 1% level of significance. Columns (II) and (III) shows that the impact of resilience on household food and nutrition security was similar for both shock affected and non-shock affected households.

Table 40. Treatment effect of absorptive capacity on food and nutrition security under cereal price change shock

VARIABLES	Full sample	Household is affected by cereal price change shock	Household is not affected by cereal price change shock
	(I)	(II)	(III)
Household Hunger Scale	-0.122***	-0.117***	-0.115***
	(0.00888)	(0.0138)	(0.0113)
Acceptable FCS	0.141***	0.146***	0.150***
	(0.00645)	(0.00930)	(0.00904)
Unacceptable DDS	-0.0954***	-0.0896***	-0.105***
	(0.00495)	(0.00751)	(0.00684)
Observations	40,296	18,820	20,433

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

[36] Nyahunda, L., & Tirivangasi, H. M. (2019). Challenges faced by rural people in mitigating the effects of climate change in the Mazungunye communal lands, Zimbabwe. Jamba (Potchefstroom, South Africa), 11(1), 596. https://doi.org/10.4102/jamba.v11i1.596

[37] UNFCCC, 2014, Report of the Conference of the Parties on its nineteenth session, held in Warsaw from 11 to 23 November, Decision 2/CP19, Warsaw, Poland

8.6.2 Social conflict shock

Table 41 shows the treatment effect of absorptive resilience capacities on food and nutrition security under social conflict shock. Overall, the results in Table 41 show a positive impact of household absorptive capacities on household food security as in all the cases, the absorptive capacities promote the outcome variables. Column (I) of Table 41 indicates that at the 1% level of significance, household absorptive capacity was associated with a decline in the probability of the household being in hunger, *ceteris paribus*. For households affected by the social conflict shock, Column (I) shows that absorptive capacity was likely to reduce the probability of affected households being in hunger by 0.164 points and by 0.13 points (Column II) for those not affected by the social conflict shock at the 1% level of significance, *ceteris paribus*. In addition, the results reveal that at the 1% level of significance, absorptive capacity was associated with an increase in the propensity of the affected households achieving an acceptable food consumption score (FCS) by 0.08 points. Similarly, household absorptive capacity was associated with an increase in the propensity for unaffected households achieving an acceptable food consumption FCS by 0.162 points. As for dietary diversity, Table 41 shows that at the 1% level of significance, absorptive capacity was associated with a decline in unacceptable dietary diversity by 0.08 points for households affected by social conflict shock (Column I) and by 0.106 points for unaffected households (Column II), *ceteris paribus*.

Table 41. Treatment effect of absorptive capacity on food and nutrition security under social conflict shock

VARIABLES	Household is affected by social conflict (I)	Household is not affected by social conflict (II)
Household Hunger Scale	-0.164***	-0.130***
	(0.0573)	(0.00899)
Acceptable FCS	0.0802**	0.162***
	(0.0345)	(0.00652)
Unacceptable HDDS	-0.0816***	-0.106***
	(0.0282)	(0.00517)
Observations	1,164	38,516

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.6.3 Livestock diseases shock

Table 42 shows the treatment effect of absorptive resilience capacities on food and nutrition security under livestock disease shock. Overall, the results reveal a positive impact of household absorptive capacities on household food security for both households affected by the livestock diseases shock and those not affected as in all the cases, the absorptive capacities promoted the outcome variables. Table 42 indicates that at the 1% level of significance, household absorptive capacity is associated with a decline in the probability of the household being in hunger, *ceteris paribus*. Column (I) shows that household absorptive capacity reduced the likelihood of affected households being in hunger by 0.12 points and by 0.134 points (Column II) for those not affected by the livestock disease shock at the 1% level of significance, *ceteris paribus*. Furthermore, the results reveal that at the 1% level of significance, absorptive capacity was associated with an increase in the propensity of the affected households achieving an acceptable FCS by 0.152 points (Column (I) and by 0.162 points for unaffected households. In addition, Table 42 shows that at the 1% level of significance, absorptive capacity was associated with a decline in unacceptable dietary diversity by 0.093 points for households affected by the livestock disease shock (Column I) and by 0.108 points for unaffected households (Column II), *ceteris paribus*.

Table 42. Treatment effect of absorptive capacity on food and nutrition security under livestock disease shock

VARIABLES	Household is affected by livestock diseases (I)	Household is not affected by livestock diseases (II)
Household Hunger Scale	-0.120***	-0.134***
	(0.0216)	(0.00997)
Acceptable FCS	0.152***	0.162***
	(0.0156)	(0.00703)
Unacceptable DDS	-0.0937***	-0.108***
	(0.0114)	(0.00564)
Observations	7,249	32,576

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.6.4 Health-related shocks – HIV/AIDS

Table 43 shows the treatment effect of absorptive resilience capacities on food and nutrition security under HIV/AIDS shock. Similar to the impact of absorptive capacity on food and nutrition security under cereal price change (Table 40), social conflict (Table 41)

and livestock diseases (Table 42), the results in Table 43 reveal a positive impact of household absorptive capacities on household food security for both households affected by the HIV/AIDS shock and those not affected as in all the cases, the absorptive capacities promoted the outcome variables. At the 1% level of significance, household absorptive capacity was associated with a decline in the probability of both HIV/AIDS affected and unaffected households being in hunger and also associated with a decline in the probability of not achieving an unacceptable dietary diversity, *ceteris paribus*. Furthermore, the results reveal that at the 1% level of significance, absorptive capacity was associated with an increase in the propensity of both HIV/AIDS affected and unaffected households achieving an acceptable FCS, *ceteris paribus*. These findings corroborate findings from other studies in literature[38].

Table 43. Treatment effect of absorptive capacity on food and nutrition security under the HIV/AIDS shock

VARIABLES	Household is affected by HIV/AIDS (I)	Household is not affected by HIV/AIDS (II)
Household Hunger Scale	-0.168***	-0.137***
	(0.0357)	(0.00911)
Acceptable FCS	0.172***	0.155***
	(0.0209)	(0.00679)
Unacceptable DDS	-0.0708***	-0.104***
	(0.0166)	(0.00525)
Observations	3,324	36,337

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.6.5 Climate related shocks - drought

Table 44 shows the treatment effect of absorptive resilience capacities on food and nutrition security under HIV/AIDS shock. The results reveal a positive impact of household absorptive capacities on household food security for both households affected and unaffected by drought shock. *Ceteris paribus*, at the 1% level of significance, household absorptive capacity was associated with 0.134 points and 0.133 points decline in the probability of drought affected (Column I) and unaffected (Column II) households being in hunger, respectively. More so, drought affected households were associated with 0.109 points decline in the probability of having an unacceptable dietary diversity and those not affected by drought were similarly impacted with a 0.101 points probability decline. Furthermore, the results reveal that at the 1% level of significance, absorptive capacity was

[38] Gebre et al. (2013) Food Insecurity, Poverty, and HIV/AIDS. In: Vulnerabilities, Impacts, and Responses to HIV/AIDS in Sub-Saharan Africa. Palgrave Macmillan, London. https://doi.org/10.1057/9781137009951_5

ceteris paribus associated with an increase in the propensity of both drought affected and unaffected households achieving an acceptable FCS by 0.139 and 0.166 points, respectively.

Table 44. Treatment effect of absorptive capacity on food and nutrition security under the drought shock

VARIABLES	Household is affected by drought (I)	Household is not affected by drought (II)
Household Hunger Scale	-0.134***	-0.133***
	(0.0122)	(0.0126)
Acceptable FCS	0.139***	0.166***
	(0.00839)	(0.00978)
Unacceptable DDS	-0.109***	-0.101***
	(0.00695)	(0.00731)
Observations	22,598	17,382

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.6.6 Human- wildlife conflict shock

Table 45 shows the treatment effect of absorptive resilience capacities on food and nutrition security under human-wildlife shock. The results reveal that at the 1% level of significance, household absorptive capacity was associated with a decline in the probability of both affected and unaffected households being in hunger and also associated with a decline in the probability of the households having an unacceptable dietary diversity, *ceteris paribus*. For example, Column (I) of **Table 45** shows that at the 1% level of significance, the probability of the households affected by the human-wildlife conflict to be in hunger was reduced by 0.155 points and by 0.121 points for unaffected households, *ceteris paribus*. Overall, the results reveal a positive impact of household absorptive capacities on household food security for both households affected by human-wildlife conflict shock and those not affected as in all the cases, the absorptive capacities promoted the outcome variables, that is reduced food and nutrition insecurity.

Table 45. Treatment effect of absorptive capacity on food and nutrition security under human and wildlife shock

VARIABLES	Household is affected by human-wildlife conflict (I)	Household is not affected by human-wildlife conflict (II)
Household Hunger Scale	-0.155***	-0.121***
	(0.0318)	(0.00916)
Acceptable FCS	0.130***	0.156***
	(0.0221)	(0.00673)
Unacceptable DDS	-0.110***	-0.104***
	(0.0177)	(0.00520)
Observations	3,476	36,270

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

8.7 The impact of adaptive capacities on food and nutrition security

8.7.1 Cereal price change shock

Table 46 shows the treatment effect of adaptive resilience capacities on food and nutrition security in the face of cereal price change shock. Overall, the results in Table 46 show a positive impact of household absorptive capacities on household food security as in all the cases, the adaptive capacities promoted household food and nutrition security. The results reveal that at the 5% level of significance, household adaptive capacity was associated with a decline in the probability of households being in hunger in the three-year period under review, *ceteris paribus*. Column (I) shows that for the full sample household adaptive capacities reduced the probability of sampled households being in hunger by 0.023 points, increased the probability of the household having an acceptable FCS by 10.3% and reduced the probability of the household having an unacceptable HDDS by 6.35% at the 1% level of significance. The results in Columns (II) and (III) show positive impact of adaptive capacities on food and nutrition security proxies for both shock affected and non-shock affected households.

Table 46. Treatment effect of adaptive capacity on food and nutrition security under cereal price change shock

VARIABLES	Full sample	Household is affected by cereal price change shock	Household is not affected by cereal price change shock
	(I)	(II)	(III)
Household Hunger Scale	-0.0234**	-0.0397**	-0.0186
	(0.0111)	(0.0171)	(0.0140)
Acceptable FCS	0.103***	0.0720***	0.110***
	(0.00938)	(0.0149)	(0.0139)
Unacceptable HDDS	-0.0635***	-0.0580***	-0.0584***
	(0.00655)	(0.0109)	(0.00867)
Observations	40,296	18,820	20,433

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.3.7 Social conflict shock

Table 47 shows the treatment effect of adaptive resilience capacities on food and nutrition security under social conflict shock. Overall, the results in Table 47 show a positive impact of household adaptive capacity on household food security as in all the cases, the adaptive capacities reduced household food and nutrition insecurity. For households affected by social conflict, Column (I) shows that adaptive capacity was likely to reduce the probability

of affected households being in hunger by 0.14 points (Column I) at the 5% level of significance and by 0.073 points (Column II) for those not affected by the social conflict at the 1% level of significance, *ceteris paribus*. Furthermore, the results reveal that at the 1% level of significance, adaptive capacity was associated with an increase in the propensity of the affected households achieving an acceptable food consumption score (FCS) by 0.12 points and by 0.139 points for unaffected households. The results further reveal that at the 1% level of significance, adaptive capacity was associated with a decline in the probability of having an unacceptable HDDS by 0.111 points for households affected by social conflict (Column I) and by 0.098 points for unaffected households (Column II), *ceteris paribus*.

Table 47. Treatment effect of adaptive capacity on food and nutrition security under social conflict shock

VARIABLES	Household is affected by social conflict (I)	Household is not affected by social conflict (II)
Household Hunger Scale	-0.140**	-0.0725***
	(0.0598)	(0.00890)
Acceptable FCS	0.120***	0.139***
	(0.0400)	(0.00672)
Unacceptable HDDS	-0.111***	-0.0983***
	(0.0323)	(0.00519)
Observations	1,164	38,516

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.3.8 Livestock diseases

Table 48 shows the treatment effect of adaptive resilience capacities on food and nutrition security in the face of livestock disease shock. Overall, the results reveal a positive impact of household absorptive capacities on household food security for both households affected by the livestock disease shock and those not affected, as in all the cases, the adaptive capacities reduced food insecurity. Column (I) of Table 48 indicates that at the 1% level of significance, household adaptive capacity was associated with a decline in the probability of the household being in hunger for both affected and unaffected households, *ceteris paribus*. Similarly, at the 1% level of significance, adaptive capacity was associated with a decline in the probability of the having an unacceptable HDDS for both affected and unaffected households, *ceteris paribus*. In addition, Table 48 shows that adaptive capacity increased the propensity of both affected and unaffected households achieving an acceptable FCS.

Table 48. Treatment effect of adaptive capacity on food and nutrition security under livestock disease shock

VARIABLES	Household is affected by livestock diseases (I)	Household is not affected by livestock diseases (II)
Household Hunger Scale	-0.0802***	-0.0723***
	(0.0232)	(0.00967)
Acceptable FCS	0.119***	0.143***
	(0.0164)	(0.00714)
Unacceptable HDDS	-0.0716***	-0.0993***
	(0.0120)	(0.00573)
Observations	7,249	32,576

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.3.9 Health related - HIV/AIDS

Table 49 shows the treatment effect of adaptive resilience capacities on food and nutrition security in the face of HIV/AIDS shock. The results reveal a positive impact of household absorptive capacities on household food security for both HIV/AIDS affected and unaffected households as in all the cases, the adaptive capacities reduced food and nutrition insecurity. At the 1% level of significance, household adaptive capacity was associated with 0.99 points (Column I) decline in the probability of HIV/AIDS affected households being in hunger and 0.73 points (Column II) decline in the probability of HIV/AIDS unaffected households being in hunger. More so, at the 1% level of significance, adaptive capacity was associated with 0.122 points decline in the probability of affected households having an unacceptable HDDS and 0.093 points decline in the probability of unaffected households having an unacceptable dietary diversity score, *ceteris paribus*. Furthermore, the results reveal that at the 1% level of significance, adaptive capacity was associated with an increase in the propensity of both HIV/AIDS affected and unaffected households achieving an acceptable FCS, *ceteris paribus*.

Table 49. Treatment effect of adaptive capacity on food and nutrition security under HIV/AIDS shock

VARIABLES	Household is affected by HIV/AIDS (I)	Household is not affected by HIV/AIDS (II)
Household Hunger Scale	-0.0999***	-0.0736***
	(0.0364)	(0.00898)
Acceptable FCS	0.182***	0.140***
	(0.0216)	(0.00682)
Unacceptable HDDS	-0.122***	-0.0937***
	(0.0192)	(0.00532)
Observations	3,324	36,337

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.3.10 Climate related - drought

Table 50 shows the treatment effect of adaptive resilience capacities on food and nutrition security in the face of drought. *Ceteris paribus*, at the 1% level of significance, household adaptive capacity was associated with 0.084 points and 0.07 points decline in the probability of drought affected (Column I) and unaffected (Column II) households being in hunger, respectively. Furthermore, the results in Table 50 show that drought affected households were associated with 0.119 points decline in the probability of having an unacceptable HDDS and those not affected by drought were similarly impacted with a 0.083 points probability decline in the household having an unacceptable HDDS. The results also reveal that at the 1% level of significance, adaptive capacity was *ceteris paribus* associated with an increase in the propensity of both drought affected and unaffected households achieving an acceptable FCS by 0.138 and 0.156 points, respectively. The results reveal a positive impact of household adaptive capacities on household food nutrition security for both households affected and unaffected by drought shock.

Table 50. Treatment effect of adaptive capacity on food and nutrition security under drought shock

VARIABLES	Household is affected by drought (I)	Household is not affected by drought (II)
Household Hunger Scale	-0.0848***	-0.0705***
	(0.0133)	(0.0117)
Acceptable FCS	0.138***	0.156***
	(0.00867)	(0.0100)
Unacceptable HDDS	-0.119***	-0.0831***
	(0.00728)	(0.00705)
Observations	22,598	17,382

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.3.11 Human wildlife conflict

Table 51 shows the treatment effect of adaptive resilience capacities on food and nutrition security under human-wildlife shock. The results reveal that at the 1% level of significance, household adaptive capacity was associated with a decline in the probability of both the affected and unaffected households being in hunger and a decline in the probability of the both affected and unaffected households having an unacceptable HDDS, *ceteris paribus*. For example, Column (I) of **Table 51** shows that at the 1% level of significance, the probability of the households affected by the human-wildlife conflict to have an unacceptable HDDS is reduced by 0.136 points and by 0.092 points for unaffected households, *ceteris paribus*. Overall, the results reveal a positive impact of household absorptive capacities on household food security for both households affected by human-wildlife conflict shock and those not affected as in all the cases, the absorptive capacities promoted the outcome variables, that is reduced food insecurity.

Table 51. Treatment effect of adaptive capacity on food and nutrition security in the face of human and wildlife conflict

VARIABLES	Household is affected by human-wildlife conflict (I)	Household is not affected by human-wildlife conflict (II)
Household Hunger Scale	-0.135***	-0.0700***
	(0.0337)	(0.00899)
Acceptable FCS	0.136***	0.141***
	(0.0224)	(0.00686)
Unacceptable HDDS	-0.136***	-0.0926***
	(0.0186)	(0.00539)
Observations	3,476	36,270

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

8.8 The impact of transformative capacities on food and nutrition security

8.8.1 Cereal price change

Table 52 shows the treatment effect of transformative resilience capacities on food and nutrition security in the face of cereal price change shock. The results show that at the 1% level of significance, household transformative capacity was associated with a decline in the household probability of achieving an acceptable FCS, ceteris paribus. In particular, Column (I) shows that for the full sample transformative capacities reduced the probability for a household achieving an acceptable FCS by 0.043 points at the 1% level of significance for the full sample, by 0.05 points (Column II) in for the shock affected and by 0.056 points (Column III) for the non-shock households, ceteris paribus. Furthermore, the results show that at the 1% level of significance, transformative capacity was associated with a decline in the probability of households having an unacceptable HDDS by 0.055 points (Column III) for the non-shock households. However, the results showed no statistical significance on the impact of transformative capacities on hunger in the face of cereal price changes.

Table 52. Treatment effect of transformative capacity on food and nutrition security in the face of cereal price change

VARIABLES	Full sample	Household is affected by cereal price change shock	Household is not affected by cereal price change shock
	(I)	(II)	(III)
Household Hunger Scale	-0.00511	-0.0199	0.00296
	(0.0119)	(0.0235)	(0.0175)
Acceptable FCS	-0.0438***	-0.0507***	-0.0558***
	(0.0105)	(0.0171)	(0.0155)
Unacceptable DDS	-0.0143*	0.0142	-0.0282***
	(0.00735)	(0.0127)	(0.00976)
Observations	40,296	18,820	20,433

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.8.2 Social conflict

The results presented in Table 53 show the treatment effect of transformative resilience capacities on food and nutrition security under social conflict shock. Except for an increase in the propensity of the affected households achieving an acceptable food consumption score (FCS) by 0.067 points, households affected by social conflict at the 1% level of

significance, no other significant difference was statistically significant for the other variables.

Table 53. Treatment effect of transformative capacity on food and nutrition security in the face of social conflict

VARIABLES	Household is affected by social conflict (I)	Household is not affected by social conflict (II)
Household Hunger Scale	-0.116*	0.0139
	(0.0594)	(0.0149)
Acceptable FCS	-0.0679***	0.0399
	(0.0114)	(0.0514)
Unacceptable DDS	0.0335	0.00851
	(0.0438)	(0.00879)
Observations	1,164	38,516

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8.8.3 Livestock diseases

The results presented Table 54 shows the treatment effect of adaptive resilience capacities on food and nutrition security in the face of livestock disease shock. Column (I) of Table 54 indicates that at the 1% level of significance, transformative capacity reduced the probability of both affected and unaffected households achieving an acceptable FCS by 0.058 and 0.054 points, respectively. However, the results reveal that household transformative capacity does not impact on HHS and HDDS as there was no statistically significant difference between households affected by livestock diseases and those not affected.

Table 54. Treatment effect of transformative capacity on food and nutrition security in the face of livestock diseases

VARIABLES	Household is affected by livestock diseases (I)	Household is not affected by livestock diseases (II)
Household Hunger Scale	-0.0269	0.00311
	(0.0249)	(0.0150)
Acceptable FCS	-0.0586**	-0.0543***
	(0.0250)	(0.0118)
Unacceptable HDDS	0.0179	0.00356
	(0.0178)	(0.00910)
Observations	7,249	32,576

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

8.8.4 Health related - HIV/AIDS

Table 55 shows the treatment effect of transformative resilience capacities on food and nutrition security in the face of HIV/AIDS as a shock. The results reveal that at the 1% level of significance, transformative capacity was *ceteris paribus* associated with a reduced propensity for HIV/AIDS unaffected households achieving an acceptable FCS by 0.072 points.

However, the results reveal that household transformative capacity did not impact on household acceptable FCS for HIV/AIDS affected households and on household hunger scale and HDDS as the difference was not statistically significant.

Table 55. Treatment effect of transformative capacity on food and nutrition security in the face of HIVAIDS

VARIABLES	Household is affected by HIV/AIDS (I)	Household is not affected by HIV/AIDS (II)
Household Hunger Scale	**0.0120**	**0.0206**
	(0.0531)	**(0.0149)**
Acceptable FCS	**-0.0588***	**-0.0721*****
	(0.0353)	**(0.0109)**
Unacceptable HDDS	**0.00196**	**0.0122**
	(0.0316)	**(0.00934)**
Observations	**3,324**	**36,337**

Standard errors in parentheses

***** p<0.01, ** p<0.05, * p<0.1**

8.8.5 Climate related - drought

Similar to the impact of transformative capacity on household food and nutrition security in the face of HIV/AIDS shock, **Table 56** shows that at the 1% level of significance, transformative capacity was *ceteris paribus* associated with a reduced propensity of households not affected by drought achieving an acceptable FCS by 0.09 points. However, the results reveal that household transformative capacity did not impact on household acceptable FCS for drought affected households and on household hunger scale and HDDS as the difference was not statistically significant.

Table 56. Treatment effect of transformative capacity on food and nutrition security in the face of drought

VARIABLES	Household is affected by drought (I)	Household is not affected by drought (II)
Household Hunger Scale	-0.00308	-0.00961
	(0.0186)	(0.0219)
Acceptable FCS	-0.0255*	-0.0908***
	(0.0135)	(0.0186)
Unacceptable DDS	0.00211	0.00304
	(0.0107)	(0.0127)
Observations	22,598	17,382

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

8.8.6 Human Wildlife

Table 57 shows the treatment effect of transformative resilience capacities on food and nutrition security in the face of human-wildlife conflict. The results reveal that at the 1% level of significance, transformative capacity was *ceteris paribus* associated with a reduced propensity for households not affected by human-wildlife conflict having an acceptable FCS by 0.072 points. However, the results reveal that household transformative capacity did not impact on acceptable FCS for households affected by human-wildlife conflict and on household hunger scale and HDDS.

Table 57. Treatment effect of transformative capacity

VARIABLES	Household is affected by human-wildlife conflict (I)	Household is not affected by human-wildlife conflict (II)
Household Hunger Scale	-0.0160	0.00811
	(0.0479)	(0.0151)
Acceptable FCS	-0.0631*	-0.0704***
	(0.0353)	(0.0116)
Unacceptable HDDS	0.0345	0.00669
	(0.0310)	(0.00915)
Observations	3,476	36,270

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Chapter Summary

Absorptive capacity

- The results show that absorptive capacity reduced the propensity of both drought affected and unaffected households from being in hunger, reduced the probability of both households having an unacceptable HDDS and increased the probability of both affected and unaffected households achieving an acceptable FCS.
- The above trends on the impact of absorptive capacity on food and nutrition security in the face of drought were similar for all other shocks investigated in this study such as HIV/AIDS, social conflict, human and wildlife conflict and livestock diseases.
- Overall, the results reveal a positive impact of household absorptive capacities on household food and nutrition security in the face of the following shocks; drought, livestock diseases, social conflict, human and wildlife conflict and HIV/AIDS; absorptive capacities promoted the outcome variables, that is, reduced food and nutrition insecurity.

Adaptive capacity

- Overall, the results reveal a positive impact of household adaptive capacities on food security in the face of the following shocks; drought, livestock diseases, social conflict, human and wildlife conflict and HIV/AIDS, i.e. adaptive capacities reduced food and nutrition insecurity.
- For example, the results reveal that at the 1% level of significance, household adaptive capacity was associated with 0.084 points and 0.07 points decline in the probability of drought affected and unaffected households being in hunger, respectively.
- Drought affected households were associated with 0.119 points decline in the probability of having an unacceptable HDDS and those not affected by drought were similarly impacted with a 0.083 points probability decline in the household having an unacceptable HDDS.
- More so, adaptive capacity is *ceteris paribus* associated with an increase in the propensity of both drought affected and unaffected households achieving an acceptable FCS by 0.138 and 0.156 points, respectively.
- The above trends on the impact of adaptive capacity on food and nutrition security in the face of drought shock were similar for all other shocks investigated in this study.

Transformative capacity

- For all shocks considered in this study, the results reveal that at the 1% level of significance, transformative capacity was *ceteris paribus* associated with a reduced probability of households not affected by shocks achieving an acceptable FCS.
- However, the results show that household transformative capacity did not have an impact on acceptable FCS for households affected shocks.
- The results reveal that household transformative capacity did not impact on household hunger and household dietary diversity as there was no statistically significant difference between shock affected and not affected households.

Recommendations

Based on the above major findings, the following recommendations are put forward.

3. The study revealed that most of the sampled households are yet to build up transformative capacities. There is need to build and improve the transformative capacities.
    - For example, in rural areas, an important pathway for building long lasting resilience capacity to food insecurity is through productivity and efficiency[39]. As such, the GoZ and its Development Partners are encouraged to continue promoting efficient production systems, for instance through the adoption of better agronomic practices, diversification, agro-ecological management or sustainable intensification (e.g. the Pfumvudza model).
    - Resilience capacity could be developed through asset accumulation and capital formation as a household with more assets is likely to be more resilient to shocks that threaten food security through consumption smoothing (i.e., selling assets to maintain current level of consumption)[40]. The livestock restocking exercise through the provision of heifers and subsidised artificial insemination are good intervention programmes being implemented by the GoZ and its Development Partners that need to be upscaled throughout the country.

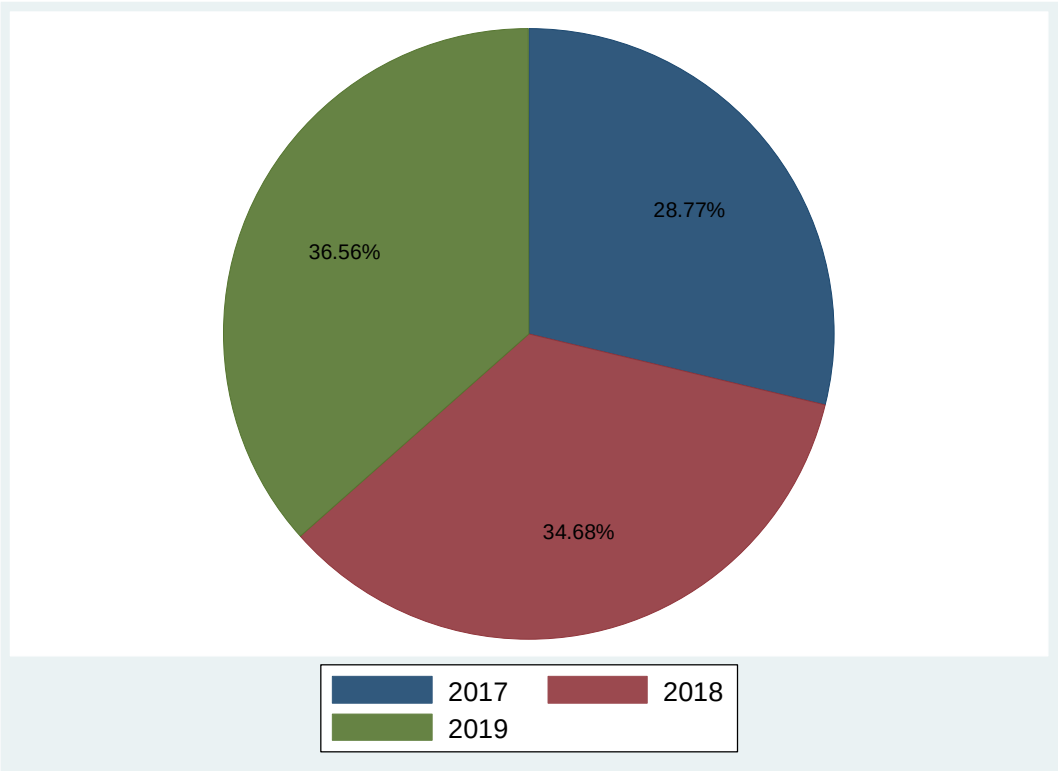
4. The study showed that female headed households and those with chronically ill members are move vulnerable to food and nutrition insecurities and it is therefore recommended that resilience intervention programmes target more of such households so as to build and improve their resilience capacities and improve on their food and nutrition security. Targeting marginalised groups such as women is crucial to reducing vulnerability and building resilience. Resilience policy-making, programming and funding instruments should embrace the 'leave no one behind' principle explicitly, prioritising actions to support the poorest and most marginalised with the sim of ending extreme poverty and reducing inequalities.

[39] Keil et al. (2008). What determines farmers' resilience towards ENSO-related drought? An empirical assessment in Central Sulawesi, Indonesia. *Climatic Change*, *86*, 291–307

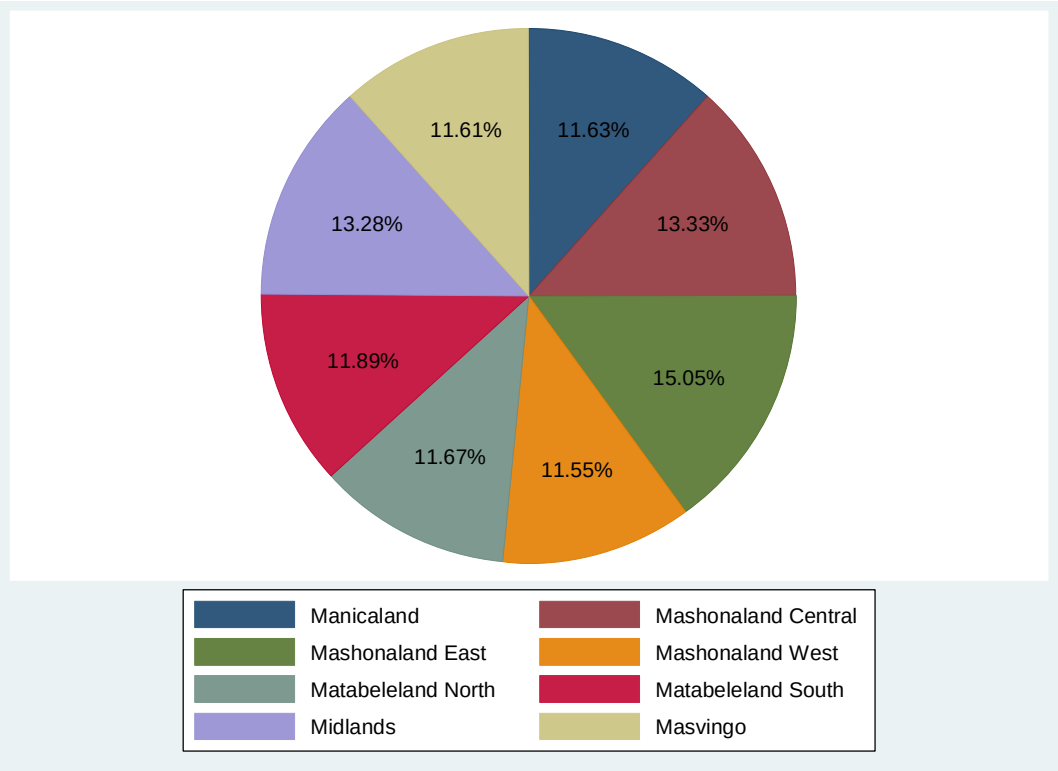
[40] Smith, L. C., & Frankenberger, T. R. (2018). Does resilience capacity reduce the negative impact of shocks on household food security? Evidence from the 2014 floods in northern Bangladesh. *World Development*, *102*, 358–376

Appendices

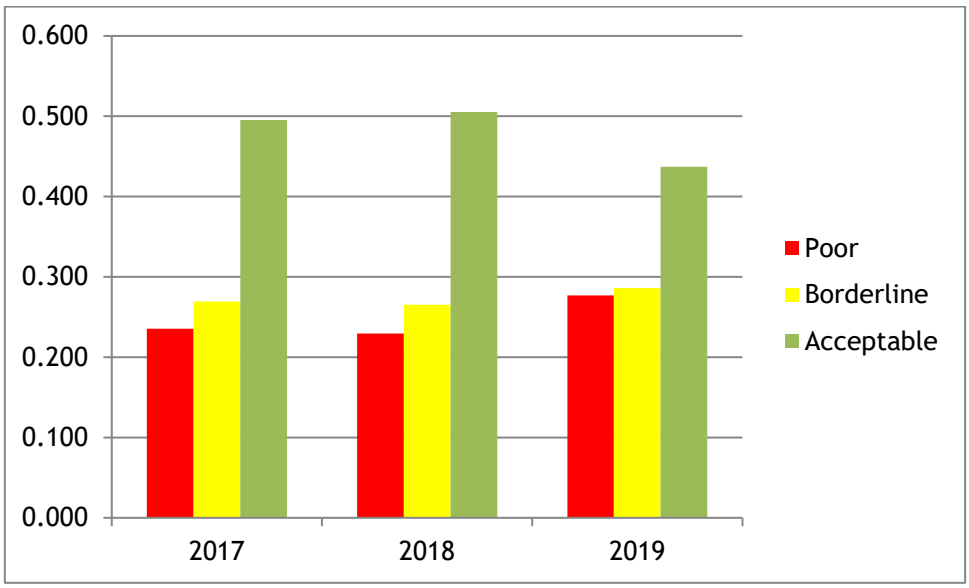
Appendix 1. Distribution of sample observations by year



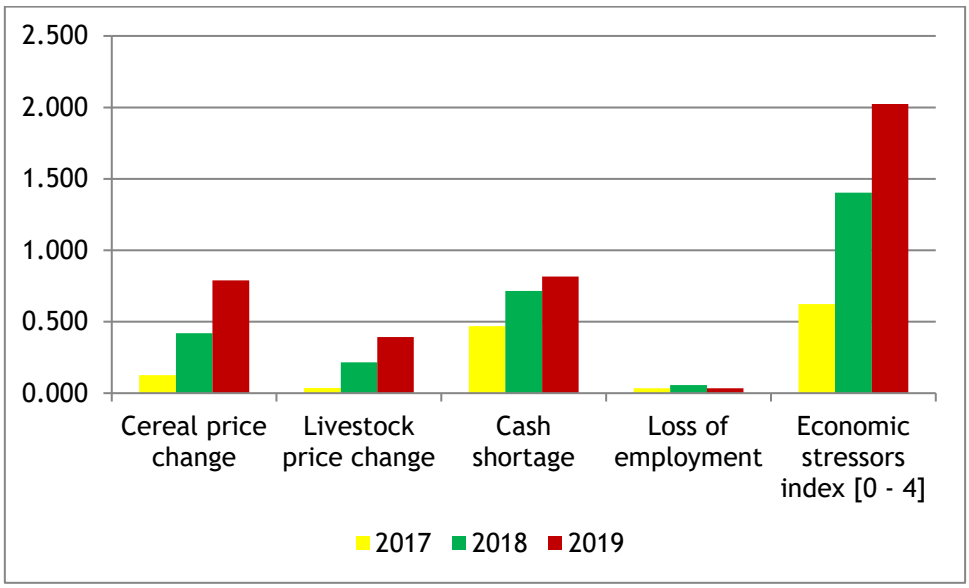
Appendix 2. Provincial distribution of sample observations



Appendix 3. FCS by year



Appendix 4. Incidence of economic stressors



Appendix 5. Probit estimates of year on year trends in economic stressors

VARIABLES	Cereal price change (I)	Livestock price change (II)	Cash shortage (III)	Loss of employment (IV)
Survey year is 2019 [1 if Yes, 0 if No]	1.956***	1.558***	0.996***	-0.0303
	(0.0202)	(0.0262)	(0.0176)	(0.0315)
Survey year is 2018 [1 if Yes, 0 if No]	0.963***	1.039***	0.675***	0.235***
	(0.0193)	(0.0264)	(0.0168)	(0.0292)
Household head is female [1 if Yes, 0 if No]	0.00872	-0.00258	-0.0190	-0.0331
	(0.0152)	(0.0157)	(0.0150)	(0.0247)
Household head age [Years]	-0.00362***	0.00320***	0.000453	-0.00286***
	(0.000511)	(0.000536)	(0.000493)	(0.000820)
Married living together	0.170***	0.0832*	0.114***	0.00301
	(0.0458)	(0.0474)	(0.0432)	(0.0709)
Married living apart	0.0269	-0.0863	0.00918	0.0806
	(0.0517)	(0.0538)	(0.0486)	(0.0786)
Divorced/separated	0.129**	-0.131**	0.0200	0.0745
	(0.0542)	(0.0574)	(0.0514)	(0.0836)
Widow/widower	0.0728	-0.111**	0.0289	0.148*
	(0.0492)	(0.0513)	(0.0464)	(0.0769)
Primary level	0.0648***	0.178***	0.141***	0.0314
	(0.0208)	(0.0229)	(0.0196)	(0.0338)
ZJC	0.131***	0.224***	0.205***	0.0470
	(0.0271)	(0.0291)	(0.0260)	(0.0438)
O' level	0.0348	0.161***	0.196***	0.0425
	(0.0243)	(0.0266)	(0.0232)	(0.0396)
A' level	0.0436	0.151*	0.251***	0.138
	(0.0843)	(0.0871)	(0.0812)	(0.126)
Diploma/Certificate after primary	0.120	0.432***	0.0489	0.256
	(0.123)	(0.130)	(0.109)	(0.168)
Diploma/Certificate after secondary	0.0729	0.169**	0.369***	0.0891
	(0.0764)	(0.0820)	(0.0742)	(0.116)
Graduate/Post-Graduate	0.111	0.0766	0.191*	-0.150
	(0.111)	(0.115)	(0.106)	(0.199)
Household size	0.0176***	0.0126***	0.0143***	-0.00881
	(0.00336)	(0.00356)	(0.00327)	(0.00554)
Household members with mental illness	0.0710***	0.0496***	0.00705	0.0379
	(0.0163)	(0.0166)	(0.0161)	(0.0263)
Household members with chronic illness	0.0559***	0.103***	0.0593***	0.131***
	(0.0190)	(0.0191)	(0.0189)	(0.0280)
Mashonaland Central	0.235***	0.382***	0.418***	-0.163***
	(0.0293)	(0.0324)	(0.0275)	(0.0479)
Mashonaland East	0.505***	0.373***	0.514***	-0.0176
	(0.0286)	(0.0312)	(0.0273)	(0.0437)
Mashonaland West	0.373***	0.370***	0.370***	0.0834*
	(0.0302)	(0.0332)	(0.0287)	(0.0449)
Matabeleland North	0.319***	0.441***	0.405***	0.00632
	(0.0304)	(0.0333)	(0.0286)	(0.0464)
Matabeleland South	0.446***	0.467***	0.0566**	0.0746
	(0.0308)	(0.0337)	(0.0280)	(0.0455)
Midlands	0.0611**	0.218***	0.0366	-0.207***
	(0.0285)	(0.0323)	(0.0269)	(0.0487)
Masvingo	0.340***	0.454***	0.299***	-0.0954**
	(0.0306)	(0.0326)	(0.0282)	(0.0478)
Constant	-1.561***	-2.582***	-0.661***	-1.685***
	(0.0600)	(0.0659)	(0.0556)	(0.0907)
Observations	39,253	39,147	39,592	39,126

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

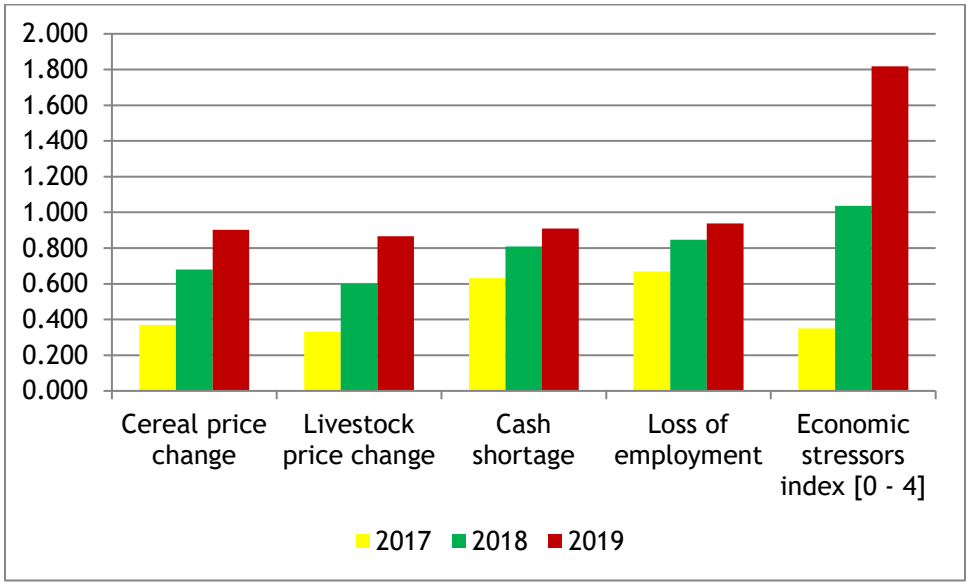
Appendix 6. Probit estimates of general trends in economic stressors

VARIABLES	Cereal price change (I)	Livestock price change (II)	Cash shortage (III)	Loss of employment (IV)
Year	0.980***	0.698***	0.499***	-0.0301**
	(0.00996)	(0.0102)	(0.00897)	(0.0136)
Household head is female [1 if Yes, 0 if No]	0.00938	-0.0125	-0.0261*	-0.0361
	(0.0152)	(0.0156)	(0.0152)	(0.0239)
Household head age [Years]	-0.00363***	0.00340***	0.000636	-0.00254***
	(0.000510)	(0.000531)	(0.000492)	(0.000810)
Married living together	0.171***	0.0749	0.106**	-0.0145
	(0.0458)	(0.0475)	(0.0433)	(0.0706)
Married living apart	0.0275	-0.0946*	0.00472	0.0674
	(0.0517)	(0.0539)	(0.0487)	(0.0783)
Divorced/separated	0.130**	-0.147**	0.00762	0.0471
	(0.0542)	(0.0575)	(0.0514)	(0.0833)
Widow/widower	0.0732	-0.117**	0.0251	0.131*
	(0.0492)	(0.0514)	(0.0465)	(0.0765)
Primary level	0.0649***	0.174***	0.138***	0.0282
	(0.0208)	(0.0227)	(0.0196)	(0.0336)
ZJC	0.131***	0.219***	0.199***	0.0374
	(0.0271)	(0.0290)	(0.0260)	(0.0436)
O' level	0.0348	0.160***	0.194***	0.0400
	(0.0243)	(0.0265)	(0.0232)	(0.0394)
A' level	0.0437	0.148*	0.248***	0.133
	(0.0844)	(0.0865)	(0.0812)	(0.125)
Diploma/Certificate after primary	0.121	0.408***	0.0354	0.235
	(0.123)	(0.128)	(0.109)	(0.167)
Diploma/Certificate after secondary	0.0719	0.182**	0.377***	0.107
	(0.0764)	(0.0814)	(0.0740)	(0.116)
Graduate/Post-Graduate	0.110	0.0885	0.199*	-0.130
	(0.111)	(0.114)	(0.106)	(0.196)
Household size	0.0178***	0.00915***	0.0115***	-0.0127**
	(0.00335)	(0.00354)	(0.00325)	(0.00558)
Household members with mental illness	0.0714***	0.0433***	0.00171	0.0285
	(0.0163)	(0.0166)	(0.0162)	(0.0261)
Household members with chronic illness	0.0557***	0.106***	0.0621***	0.136***
	(0.0190)	(0.0191)	(0.0190)	(0.0278)
Mashonaland Central	0.234***	0.385***	0.418***	-0.159***
	(0.0293)	(0.0323)	(0.0274)	(0.0476)
Mashonaland East	0.504***	0.377***	0.509***	-0.0159
	(0.0287)	(0.0312)	(0.0272)	(0.0435)
Mashonaland West	0.372***	0.375***	0.367***	0.0868*
	(0.0303)	(0.0333)	(0.0286)	(0.0447)
Matabeleland North	0.319***	0.438***	0.404***	0.00683
	(0.0304)	(0.0331)	(0.0285)	(0.0462)
Matabeleland South	0.446***	0.465***	0.0541*	0.0715
	(0.0308)	(0.0335)	(0.0279)	(0.0453)
Midlands	0.0606**	0.217***	0.0365	-0.210***
	(0.0286)	(0.0322)	(0.0268)	(0.0484)
Masvingo	0.340***	0.456***	0.297***	-0.0988**
	(0.0307)	(0.0324)	(0.0281)	(0.0475)
Constant	-1,978***	-1,411***	-1,008***	59.25**
	(20.11)	(20.61)	(18.11)	(27.44)
Observations	39,253	39,147	39,592	39,126

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 7. Trends in economic stressors severity



Appendix 8. Probit estimates of year on year trends in the severity of economic stressors

VARIABLES	Cereal price impact (I)	Livestock price impact (II)	Cash shortage impact (III)	Loss employment impact (IV)
Survey year is 2019 [1 if Yes, 0 if No]	1.650***	1.541***	1.007***	1.074***
	(0.0398)	(0.0747)	(0.0249)	(0.118)
Survey year is 2018 [1 if Yes, 0 if No]	0.823***	0.694***	0.552***	0.607***
	(0.0398)	(0.0749)	(0.0233)	(0.0936)
Household head is female [1 if Yes, 0 if No]	0.00893	0.0412	0.00223	-0.146
	(0.0229)	(0.0314)	(0.0202)	(0.0909)
Household head age [Years]	-0.00258***	-0.000983	-0.00221***	-0.0127***
	(0.000804)	(0.00108)	(0.000666)	(0.00297)
Married living together	0.191***	-0.0218	0.0670	0.276
	(0.0663)	(0.0974)	(0.0603)	(0.230)
Married living apart	0.0800	-0.0829	-0.0947	0.201
	(0.0755)	(0.111)	(0.0671)	(0.254)
Divorced/separated	0.205**	0.0453	0.170**	0.290
	(0.0805)	(0.118)	(0.0729)	(0.281)
Widow/widower	0.241***	0.0539	0.0909	0.527**
	(0.0727)	(0.106)	(0.0648)	(0.242)
Primary level	-0.0801**	-0.00625	-0.0519*	-0.407***
	(0.0337)	(0.0465)	(0.0277)	(0.122)
ZJC	-0.0707*	-0.0121	-0.0916***	-0.383**
	(0.0429)	(0.0581)	(0.0355)	(0.159)
O' level	-0.160***	0.00635	-0.0560*	-0.432***
	(0.0387)	(0.0539)	(0.0320)	(0.144)
A' level	-0.00500	0.0748	-0.129	-0.280
	(0.131)	(0.184)	(0.102)	(0.449)
Diploma/Certificate after primary	0.117	0.0789	-0.152	-0.921**
	(0.192)	(0.208)	(0.159)	(0.439)
Diploma/Certificate after secondary	-0.348***	-0.0442	-0.291***	-0.682*
	(0.111)	(0.159)	(0.0885)	(0.403)
Graduate/Post-Graduate	-0.216	0.000936	-0.160	-0.499
	(0.162)	(0.242)	(0.138)	(0.751)
Household size	0.00172	-0.0110	0.00244	-0.0193
	(0.00527)	(0.00691)	(0.00441)	(0.0188)
Household members with mental illness	0.0590**	0.0514	0.0529**	0.126
	(0.0255)	(0.0331)	(0.0225)	(0.0887)
Household members with chronic illness	0.0136	0.0945**	0.000644	0.174
	(0.0288)	(0.0376)	(0.0247)	(0.107)
Mashonaland Central	-0.145***	-0.113	-0.0450	-0.428**
	(0.0498)	(0.0714)	(0.0396)	(0.170)
Mashonaland East	-0.0216	-0.0653	-0.111***	-0.173
	(0.0476)	(0.0697)	(0.0375)	(0.156)
Mashonaland West	-0.0982**	-0.0483	-0.273***	-0.351**
	(0.0499)	(0.0723)	(0.0395)	(0.157)
Matabeleland North	0.0892*	0.171**	0.0761*	0.104
	(0.0512)	(0.0729)	(0.0412)	(0.177)
Matabeleland South	-0.0858*	-0.154**	-0.138***	-0.522***
	(0.0499)	(0.0709)	(0.0423)	(0.157)
Midlands	-0.144***	-0.218***	-0.284***	0.0706
	(0.0514)	(0.0729)	(0.0401)	(0.202)
Masvingo	0.0541	0.149**	-0.0283	0.242
	(0.0514)	(0.0741)	(0.0410)	(0.191)
Constant	-0.305***	-0.324**	0.509***	1.388***
	(0.0942)	(0.148)	(0.0781)	(0.320)
Observations	18,801	9,139	27,072	1,634

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

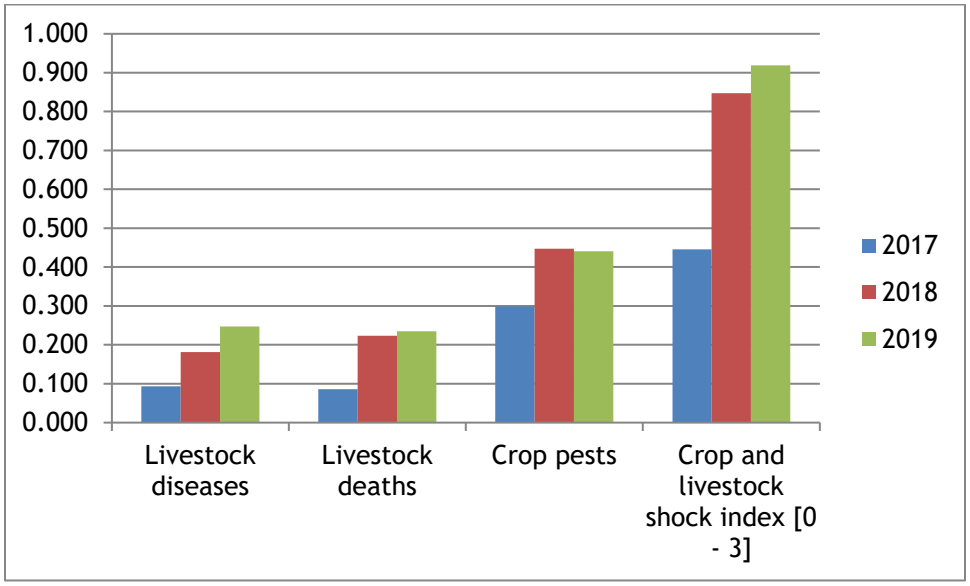
Appendix 9. Probit estimates of the general trend in the severity of the impact of economic stressors

VARIABLES	Cereal price impact (I)	Livestock price impact (II)	Cash shortage impact (III)	Loss employment impact (IV)
Year	0.826***	0.815***	0.502***	0.547***
	(0.0174)	(0.0271)	(0.0125)	(0.0602)
Household head is female [1 if Yes, 0 if No]	0.00903	0.0435	-0.00106	-0.145
	(0.0229)	(0.0313)	(0.0203)	(0.0922)
Household head age [Years]	-0.00258***	-0.000974	-0.00215***	-0.0126***
	(0.000803)	(0.00108)	(0.000666)	(0.00298)
Married living together	0.191***	-0.0212	0.0644	0.265
	(0.0663)	(0.0973)	(0.0603)	(0.231)
Married living apart	0.0801	-0.0816	-0.0972	0.202
	(0.0755)	(0.111)	(0.0671)	(0.255)
Divorced/separated	0.206**	0.0470	0.165**	0.278
	(0.0805)	(0.118)	(0.0730)	(0.282)
Widow/widower	0.241***	0.0542	0.0894	0.519**
	(0.0727)	(0.106)	(0.0649)	(0.243)
Primary level	-0.0801**	-0.00565	-0.0529*	-0.407***
	(0.0337)	(0.0465)	(0.0277)	(0.122)
ZJC	-0.0707*	-0.0116	-0.0931***	-0.388**
	(0.0430)	(0.0581)	(0.0355)	(0.158)
O' level	-0.160***	0.00677	-0.0568*	-0.434***
	(0.0387)	(0.0539)	(0.0320)	(0.144)
A' level	-0.00494	0.0759	-0.130	-0.278
	(0.131)	(0.184)	(0.102)	(0.446)
Diploma/Certificate after primary	0.117	0.0834	-0.155	-0.924**
	(0.192)	(0.208)	(0.159)	(0.435)
Diploma/Certificate after secondary	-0.348***	-0.0462	-0.288***	-0.671*
	(0.111)	(0.159)	(0.0886)	(0.405)
Graduate/Post-Graduate	-0.216	0.00321	-0.157	-0.512
	(0.162)	(0.241)	(0.138)	(0.751)
Household size	0.00174	-0.0101	0.00171	-0.0203
	(0.00526)	(0.00690)	(0.00438)	(0.0186)
Household members with mental illness	0.0590**	0.0525	0.0515**	0.121
	(0.0255)	(0.0330)	(0.0225)	(0.0887)
Household members with chronic illness	0.0135	0.0931**	0.000905	0.178*
	(0.0288)	(0.0374)	(0.0248)	(0.108)
Mashonaland Central	-0.145***	-0.119*	-0.0414	-0.424**
	(0.0496)	(0.0714)	(0.0397)	(0.170)
Mashonaland East	-0.0219	-0.0741	-0.108***	-0.166
	(0.0473)	(0.0696)	(0.0375)	(0.156)
Mashonaland West	-0.0986**	-0.0599	-0.269***	-0.342**
	(0.0497)	(0.0722)	(0.0395)	(0.158)
Matabeleland North	0.0890*	0.173**	0.0801*	0.107
	(0.0511)	(0.0732)	(0.0412)	(0.177)
Matabeleland South	-0.0861*	-0.158**	-0.135***	-0.522***
	(0.0497)	(0.0711)	(0.0423)	(0.157)
Midlands	-0.144***	-0.219***	-0.280***	0.0624
	(0.0513)	(0.0730)	(0.0401)	(0.203)
Masvingo	0.0538	0.143*	-0.0246	0.235
	(0.0512)	(0.0740)	(0.0410)	(0.192)
Constant	-1,666***	-1,645***	-1,012***	-1,101***
	(35.12)	(54.75)	(25.31)	(121.5)
Observations	18,801	9,139	27,072	1,634

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 10. Crop and livestock shocks trends



Appendix 11. Probit estimates of year on year trends in crop and livestock shocks

VARIABLES	Livestock diseases (I)	Livestock deaths (II)	Crop pests (III)
Survey year is 2019 [1 if Yes, 0 if No]	0.680***	0.691***	0.416***
	(0.0214)	(0.0217)	(0.0172)
Survey year is 2018 [1 if Yes, 0 if No]	0.446***	0.653***	0.441***
	(0.0215)	(0.0216)	(0.0171)
Household head is female [1 if Yes, 0 if No]	-0.0208	-0.0113	-0.0285**
	(0.0160)	(0.0158)	(0.0140)
Household head age [Years]	0.00837***	0.00831***	0.00290***
	(0.000533)	(0.000531)	(0.000466)
Married living together	0.0387	-0.0962**	0.145***
	(0.0507)	(0.0476)	(0.0431)
Married living apart	-0.00828	-0.0643	0.0564
	(0.0568)	(0.0535)	(0.0482)
Divorced/separated	-0.182***	-0.326***	-0.109**
	(0.0615)	(0.0589)	(0.0514)
Widow/widower	-0.0536	-0.149***	0.0920**
	(0.0542)	(0.0512)	(0.0461)
Primary level	0.136***	0.115***	0.0739***
	(0.0226)	(0.0222)	(0.0192)
ZJC	0.185***	0.164***	0.127***
	(0.0291)	(0.0289)	(0.0250)
O' level	0.168***	0.146***	0.0791***
	(0.0266)	(0.0262)	(0.0225)
A' level	0.140	0.155*	0.110
	(0.0897)	(0.0886)	(0.0758)
Diploma/Certificate after primary	0.256**	0.197	-0.137
	(0.125)	(0.124)	(0.112)
Diploma/Certificate after secondary	0.140*	0.0772	-0.0265
	(0.0806)	(0.0816)	(0.0698)
Graduate/Post-Graduate	0.0113	-0.00201	-0.287***
	(0.123)	(0.123)	(0.106)
Household size	0.0441***	0.0491***	0.0557***
	(0.00346)	(0.00345)	(0.00312)
Household members with mental illness	0.0151	0.0369**	0.0112
	(0.0167)	(0.0167)	(0.0152)
Household members with chronic illness	0.123***	0.118***	0.0608***
	(0.0188)	(0.0190)	(0.0175)
Mashonaland Central	0.283***	0.179***	0.646***
	(0.0329)	(0.0321)	(0.0268)
Mashonaland East	0.225***	0.102***	0.257***
	(0.0320)	(0.0312)	(0.0261)
Mashonaland West	0.346***	0.172***	0.396***
	(0.0334)	(0.0329)	(0.0277)
Matabeleland North	0.352***	0.234***	0.170***
	(0.0336)	(0.0327)	(0.0283)
Matabeleland South	0.167***	0.312***	-0.0192
	(0.0346)	(0.0324)	(0.0288)
Midlands	0.274***	0.117***	0.452***
	(0.0325)	(0.0319)	(0.0267)
Masvingo	0.431***	0.295***	0.775***
	(0.0327)	(0.0321)	(0.0273)
Constant	-2.392***	-2.251***	-1.489***
	(0.0670)	(0.0638)	(0.0550)
Observations	39,302	39,180	39,474

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

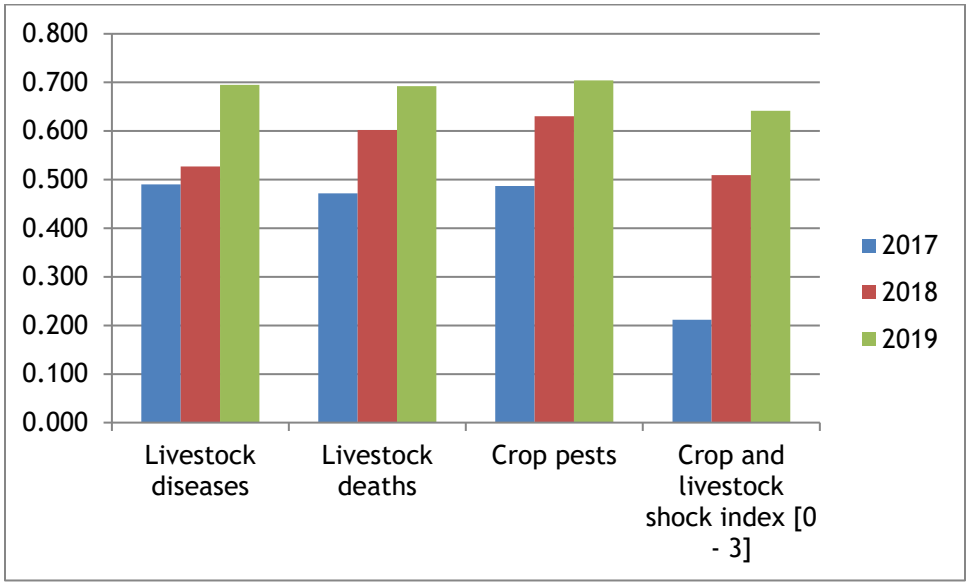
Appendix 12. Probit estimates of general trends in crop and livestock shocks

VARIABLES	Livestock diseases (I)	Livestock deaths (II)	Crop pests (III)
Year	0.325***	0.297***	0.193***
	(0.0100)	(0.00950)	(0.00838)
Household head is female [1 if Yes, 0 if No]	-0.0267*	-0.0262*	-0.0406***
	(0.0159)	(0.0157)	(0.0139)
Household head age [Years]	0.00848***	0.00853***	0.00316***
	(0.000532)	(0.000526)	(0.000464)
Married living together	0.0349	-0.108**	0.135***
	(0.0508)	(0.0477)	(0.0430)
Married living apart	-0.0118	-0.0737	0.0485
	(0.0569)	(0.0536)	(0.0481)
Divorced/separated	-0.190***	-0.349***	-0.127**
	(0.0615)	(0.0589)	(0.0512)
Widow/widower	-0.0565	-0.158***	0.0859*
	(0.0542)	(0.0512)	(0.0459)
Primary level	0.135***	0.109***	0.0711***
	(0.0226)	(0.0220)	(0.0192)
ZJC	0.182***	0.151***	0.121***
	(0.0291)	(0.0287)	(0.0249)
O' level	0.167***	0.141***	0.0782***
	(0.0266)	(0.0261)	(0.0224)
A' level	0.141	0.154*	0.106
	(0.0899)	(0.0884)	(0.0757)
Diploma/Certificate after primary	0.246**	0.166	-0.154
	(0.125)	(0.123)	(0.112)
Diploma/Certificate after secondary	0.148*	0.0953	-0.0100
	(0.0807)	(0.0811)	(0.0696)
Graduate/Post-Graduate	0.0186	0.0118	-0.271**
	(0.122)	(0.121)	(0.106)
Household size	0.0424***	0.0441***	0.0517***
	(0.00346)	(0.00343)	(0.00310)
Household members with mental illness	0.0126	0.0296*	0.00498
	(0.0167)	(0.0166)	(0.0152)
Household members with chronic illness	0.124***	0.120***	0.0632***
	(0.0188)	(0.0189)	(0.0175)
Mashonaland Central	0.284***	0.182***	0.641***
	(0.0329)	(0.0318)	(0.0267)
Mashonaland East	0.226***	0.107***	0.255***
	(0.0319)	(0.0310)	(0.0261)
Mashonaland West	0.347***	0.175***	0.392***
	(0.0334)	(0.0327)	(0.0276)
Matabeleland North	0.353***	0.236***	0.167***
	(0.0335)	(0.0323)	(0.0282)
Matabeleland South	0.166***	0.310***	-0.0260
	(0.0345)	(0.0321)	(0.0286)
Midlands	0.274***	0.117***	0.448***
	(0.0325)	(0.0316)	(0.0266)
Masvingo	0.432***	0.297***	0.768***
	(0.0327)	(0.0318)	(0.0273)
Constant	-657.5***	-601.7***	-390.9***
	(20.27)	(19.18)	(16.91)
Observations	39,302	39,180	39,474

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 13. Trends in livestock and related severity



Appendix 14. Probit estimates of year on year trends in the severity of crop and livestock shocks

VARIABLES	Livestock diseases impact (I)	Livestock deaths impact (II)	Crop pests impact (III)
Survey year is 2019 [1 if Yes, 0 if No]	0.519***	0.564***	0.567***
	(0.0479)	(0.0497)	(0.0289)
Survey year is 2018 [1 if Yes, 0 if No]	0.0835*	0.319***	0.389***
	(0.0487)	(0.0494)	(0.0282)
Household head is female [1 if Yes, 0 if No]	0.0253	0.0411	0.0117
	(0.0317)	(0.0312)	(0.0220)
Household head age [Years]	-0.00233**	0.000325	-0.00367***
	(0.00109)	(0.00108)	(0.000747)
Married living together	0.192*	0.285***	-0.0122
	(0.110)	(0.0957)	(0.0772)
Married living apart	0.184	0.217**	-0.168**
	(0.123)	(0.107)	(0.0852)
Divorced/separated	0.107	0.291**	-0.0925
	(0.135)	(0.123)	(0.0920)
Widow/widower	0.169	0.170*	-0.0631
	(0.116)	(0.102)	(0.0816)
Primary level	-0.0196	-0.117***	-0.137***
	(0.0448)	(0.0437)	(0.0306)
ZJC	-0.0973*	-0.172***	-0.224***
	(0.0575)	(0.0566)	(0.0392)
O' level	-0.0754	-0.231***	-0.236***
	(0.0531)	(0.0522)	(0.0355)
A' level	-0.139	3.32e-05	-0.187
	(0.181)	(0.182)	(0.121)
Diploma/Certificate after primary	-0.350	-0.420*	-0.289
	(0.239)	(0.236)	(0.193)
Diploma/Certificate after secondary	-0.327**	-0.376**	-0.506***
	(0.160)	(0.164)	(0.110)
Graduate/Post-Graduate	0.522*	-0.00856	-0.172
	(0.309)	(0.263)	(0.196)
Household size	-0.000131	-0.00728	0.0102**
	(0.00686)	(0.00669)	(0.00486)
Household members with mental illness	0.0694**	0.00819	0.00681
	(0.0319)	(0.0316)	(0.0233)
Household members with chronic illness	0.0246	0.127***	0.0570**
	(0.0352)	(0.0357)	(0.0263)
Mashonaland Central	-0.166**	0.00611	-0.274***
	(0.0716)	(0.0667)	(0.0458)
Mashonaland East	-0.162**	0.136**	-0.376***
	(0.0705)	(0.0664)	(0.0469)
Mashonaland West	-0.138*	0.0620	-0.433***
	(0.0718)	(0.0687)	(0.0482)
Matabeleland North	-0.200***	0.0303	-0.276***
	(0.0706)	(0.0663)	(0.0510)
Matabeleland South	-0.292***	-0.0659	-0.131**
	(0.0750)	(0.0650)	(0.0537)
Midlands	-0.218***	0.0156	-0.0200
	(0.0705)	(0.0668)	(0.0470)
Masvingo	-0.151**	0.104	0.0114
	(0.0700)	(0.0657)	(0.0464)
Constant	0.115	-0.232*	0.457***
	(0.143)	(0.131)	(0.0988)
Observations	7,146	7,459	15,921

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

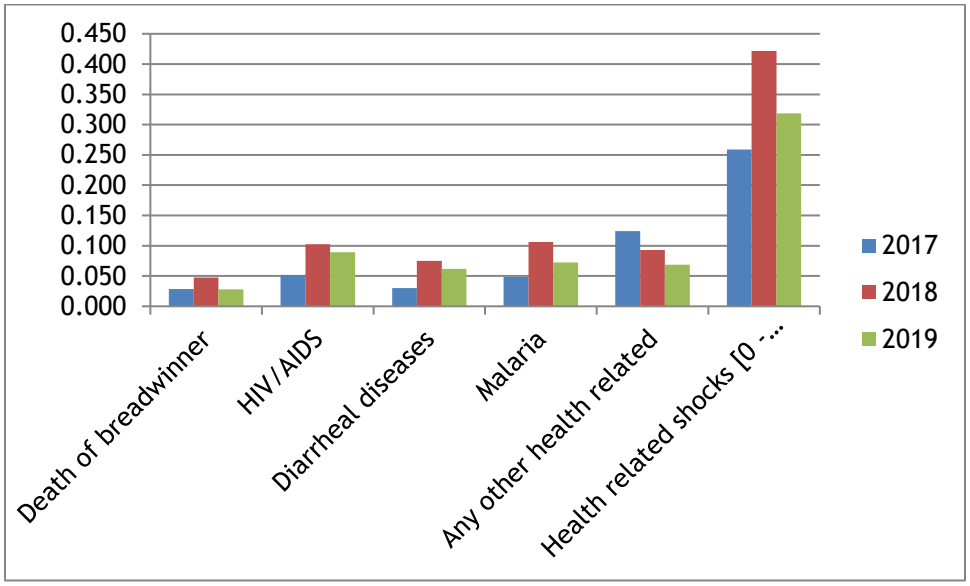
Appendix 15. Probit estimates of general trends in severity of crop and livestock shocks

VARIABLES	Livestock diseases impact	Livestock deaths impact	Crop pests impact
year	0.304***	0.271***	0.271***
	(0.0222)	(0.0227)	(0.0143)
Household head is female [1 if Yes, 0 if No]	0.0357	0.0400	0.00614
	(0.0315)	(0.0312)	(0.0221)
Household head age [Years]	-0.00249**	0.000323	-0.00348***
	(0.00109)	(0.00108)	(0.000746)
Married living together	0.195*	0.285***	-0.0125
	(0.110)	(0.0957)	(0.0774)
Married living apart	0.187	0.217**	-0.169**
	(0.123)	(0.107)	(0.0854)
Divorced/separated	0.125	0.287**	-0.101
	(0.135)	(0.123)	(0.0921)
Widow/widower	0.174	0.169*	-0.0631
	(0.116)	(0.102)	(0.0819)
Primary level	-0.0165	-0.119***	-0.135***
	(0.0448)	(0.0437)	(0.0306)
ZJC	-0.0881	-0.175***	-0.222***
	(0.0574)	(0.0565)	(0.0392)
O' level	-0.0719	-0.233***	-0.234***
	(0.0531)	(0.0522)	(0.0355)
A' level	-0.160	0.00158	-0.186
	(0.181)	(0.182)	(0.121)
Diploma/Certificate after primary	-0.325	-0.426*	-0.293
	(0.242)	(0.236)	(0.194)
Diploma/Certificate after secondary	-0.347**	-0.375**	-0.493***
	(0.162)	(0.164)	(0.110)
Graduate/Post-Graduate	0.520*	-0.0137	-0.166
	(0.306)	(0.263)	(0.196)
Household size	0.00285	-0.00798	0.00820*
	(0.00684)	(0.00666)	(0.00483)
Household members with mental illness	0.0729**	0.00762	0.00434
	(0.0317)	(0.0316)	(0.0233)
Household members with chronic illness	0.0206	0.127***	0.0570**
	(0.0350)	(0.0357)	(0.0264)
Mashonaland Central	-0.188***	0.0101	-0.275***
	(0.0716)	(0.0666)	(0.0459)
Mashonaland East	-0.185***	0.143**	-0.368***
	(0.0704)	(0.0661)	(0.0470)
Mashonaland West	-0.161**	0.0679	-0.429***
	(0.0718)	(0.0685)	(0.0482)
Matabeleland North	-0.214***	0.0339	-0.275***
	(0.0708)	(0.0662)	(0.0509)
Matabeleland South	-0.295***	-0.0618	-0.142***
	(0.0752)	(0.0648)	(0.0536)
Midlands	-0.231***	0.0184	-0.0238
	(0.0706)	(0.0667)	(0.0470)
Masvingo	-0.176**	0.109*	0.0140
	(0.0698)	(0.0654)	(0.0465)
Constant	-613.9***	-546.5***	-546.2***
	(44.85)	(45.75)	(28.86)
Observations	7,146	7,459	15,921

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 16. Trends in health-related shocks



Appendix 17. Probit estimates of year on year trends in the incidences of health-related shocks

VARIABLES	Death breadwinner (I)	HIV/AIDS (II)	Diarrheal diseases (III)	Malaria diseases (IV)	Health related (V)
Survey year is 2019 [1 if Yes, 0 if No]	-0.0350	0.272***	0.292***	0.148***	-0.343***
	(0.0355)	(0.0259)	(0.0311)	(0.0280)	(0.0233)
Survey year is 2018 [1 if Yes, 0 if No]	0.224***	0.365***	0.442***	0.418***	-0.185***
	(0.0332)	(0.0256)	(0.0302)	(0.0268)	(0.0222)
Household head is female [1 if Yes, 0 if No]	-0.0423	0.00542	0.0510**	0.0309	0.00671
	(0.0280)	(0.0194)	(0.0225)	(0.0212)	(0.0198)
Household head age [Years]	-0.000835	7.47e-05	-0.00848***	-0.00776***	0.0136***
	(0.00101)	(0.000645)	(0.000783)	(0.000706)	(0.000630)
Married living together	-0.603***	-0.136**	0.171**	0.115*	-0.279***
	(0.0692)	(0.0575)	(0.0720)	(0.0682)	(0.0612)
Married living apart	-0.372***	-0.144**	0.0538	-0.0287	-0.268***
	(0.0827)	(0.0657)	(0.0814)	(0.0768)	(0.0692)
Divorced/separated	-0.146*	0.138**	0.132	0.0233	-0.265***
	(0.0826)	(0.0665)	(0.0840)	(0.0799)	(0.0723)
Widow/widower	0.318***	0.166***	0.113	-0.0545	-0.232***
	(0.0751)	(0.0619)	(0.0779)	(0.0734)	(0.0645)
Primary level	0.0462	0.0798***	-0.110***	-0.128***	0.0954***
	(0.0349)	(0.0269)	(0.0307)	(0.0284)	(0.0256)
ZJC	0.111**	0.110***	-0.171***	-0.160***	0.108***
	(0.0474)	(0.0355)	(0.0402)	(0.0364)	(0.0344)
O' level	-0.0293	0.0181	-0.231***	-0.319***	0.0707**
	(0.0461)	(0.0330)	(0.0356)	(0.0331)	(0.0319)
A' level	-0.00752	-0.0734	-0.159	-0.395***	0.00430
	(0.166)	(0.123)	(0.121)	(0.125)	(0.117)
Diploma/Certificate after primary	0.245	-0.0328	-0.0746	-0.0694	0.309**
	(0.185)	(0.169)	(0.175)	(0.162)	(0.127)
Diploma/Certificate after secondary	-0.215	-0.338***	-0.295**	-0.479***	0.0404
	(0.173)	(0.127)	(0.122)	(0.120)	(0.0988)
Graduate/Post-Graduate	-0.188	-0.128	-0.445**	-0.561***	0.249*
	(0.288)	(0.163)	(0.203)	(0.198)	(0.131)
Household size	-0.00508	0.0178***	0.0150***	0.0291***	0.0103**
	(0.00618)	(0.00418)	(0.00505)	(0.00457)	(0.00423)
Household members with mental illness	0.0524*	-0.0300	0.00485	0.0365*	-0.00562
	(0.0299)	(0.0216)	(0.0233)	(0.0216)	(0.0218)
Household members with chronic illness	0.101***	0.312***	0.221***	0.160***	0.324***
	(0.0314)	(0.0221)	(0.0243)	(0.0241)	(0.0223)
Mashonaland Central	0.0394	0.130***	0.322***	0.507***	0.0593
	(0.0554)	(0.0407)	(0.0412)	(0.0363)	(0.0366)
Mashonaland East	0.0740	0.117***	0.0329	0.209***	-0.0461
	(0.0528)	(0.0395)	(0.0429)	(0.0371)	(0.0359)
Mashonaland West	0.219***	0.262***	0.375***	0.119***	0.116***
	(0.0540)	(0.0404)	(0.0418)	(0.0396)	(0.0372)
Matabeleland North	0.0926*	0.308***	-0.271***	-0.360***	-0.0866**
	(0.0547)	(0.0397)	(0.0519)	(0.0470)	(0.0382)
Matabeleland South	0.0926*	0.315***	-0.236***	-0.596***	-0.129***
	(0.0544)	(0.0397)	(0.0516)	(0.0549)	(0.0385)
Midlands	0.0918*	0.0757*	-0.0991**	-0.360***	-0.0452
	(0.0539)	(0.0407)	(0.0462)	(0.0448)	(0.0367)
Masvingo	0.0188	0.277***	0.175***	0.139***	0.0330
	(0.0560)	(0.0399)	(0.0441)	(0.0397)	(0.0370)
Constant	-1.725***	-1.954***	-1.682***	-1.409***	-1.755***
	(0.0970)	(0.0763)	(0.0918)	(0.0853)	(0.0769)
Observations	39,112	39,140	39,100	39,157	39,220

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

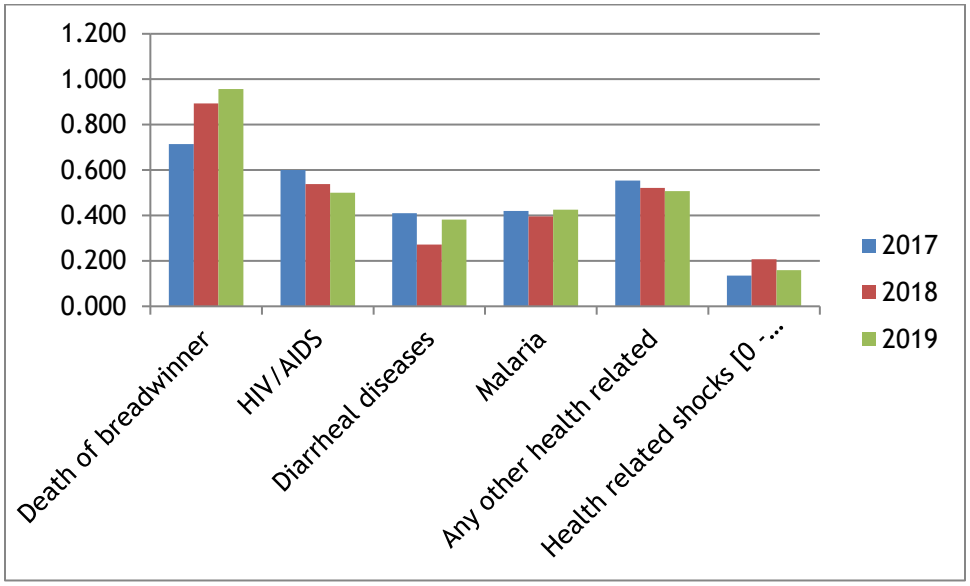
Appendix 18. Probit estimates of general trends in health-related shocks

VARIABLES	(1) Death breadwinner	(2) HIV/AIDS	(3) Diarrheal diseases	(4) Malaria diseases	(5) Health related
Year	-0.0277*	0.108***	0.104***	0.0426***	-0.172***
	(0.0152)	(0.0114)	(0.0128)	(0.0117)	(0.0117)
Household head is female [1 if Yes, 0 if No]	-0.00845	0.00323	0.0337	0.00282	0.00720
	(0.0267)	(0.0191)	(0.0220)	(0.0205)	(0.0197)
Household head age [Years]	-0.000646	0.000308	-0.00798***	-0.00717***	0.0136***
	(0.000995)	(0.000640)	(0.000772)	(0.000694)	(0.000630)
Married living together	-0.601***	-0.148**	0.154**	0.0920	-0.279***
	(0.0688)	(0.0574)	(0.0716)	(0.0675)	(0.0612)
Married living apart	-0.381***	-0.153**	0.0406	-0.0447	-0.268***
	(0.0820)	(0.0656)	(0.0808)	(0.0761)	(0.0692)
Divorced/separated	-0.166**	0.118*	0.106	-0.00984	-0.264***
	(0.0820)	(0.0665)	(0.0835)	(0.0791)	(0.0723)
Widow/widower	0.302***	0.154**	0.101	-0.0652	-0.232***
	(0.0743)	(0.0618)	(0.0773)	(0.0726)	(0.0645)
Primary level	0.0424	0.0772***	-0.110***	-0.125***	0.0956***
	(0.0346)	(0.0267)	(0.0305)	(0.0281)	(0.0256)
ZJC	0.102**	0.103***	-0.178***	-0.163***	0.108***
	(0.0471)	(0.0353)	(0.0398)	(0.0361)	(0.0344)
O' level	-0.0345	0.0165	-0.228***	-0.312***	0.0708**
	(0.0458)	(0.0328)	(0.0353)	(0.0328)	(0.0319)
A' level	-5.30e-05	-0.0707	-0.162	-0.398***	0.00456
	(0.165)	(0.123)	(0.121)	(0.124)	(0.118)
Diploma/Certificate after primary	0.237	-0.0485	-0.0715	-0.0828	0.310**
	(0.186)	(0.169)	(0.176)	(0.159)	(0.126)
Diploma/Certificate after secondary	-0.192	-0.320**	-0.271**	-0.443***	0.0397
	(0.173)	(0.126)	(0.120)	(0.119)	(0.0988)
Graduate/Post-Graduate	-0.190	-0.114	-0.415**	-0.528***	0.248*
	(0.284)	(0.161)	(0.201)	(0.196)	(0.131)
Household size	-0.00928	0.0145***	0.00911*	0.0222***	0.0105**
	(0.00621)	(0.00418)	(0.00508)	(0.00459)	(0.00422)
Household members with mental illness	0.0469	-0.0352	-0.00254	0.0292	-0.00539
	(0.0296)	(0.0215)	(0.0232)	(0.0216)	(0.0218)
Household members with chronic illness	0.104***	0.312***	0.223***	0.162***	0.324***
	(0.0311)	(0.0220)	(0.0243)	(0.0241)	(0.0223)
Mashonaland Central	0.0364	0.128***	0.331***	0.511***	0.0591
	(0.0550)	(0.0405)	(0.0409)	(0.0358)	(0.0366)
Mashonaland East	0.0730	0.115***	0.0433	0.216***	-0.0462
	(0.0525)	(0.0393)	(0.0427)	(0.0367)	(0.0359)
Mashonaland West	0.215***	0.258***	0.378***	0.131***	0.116***
	(0.0538)	(0.0402)	(0.0414)	(0.0392)	(0.0372)
Matabeleland North	0.0910*	0.310***	-0.256***	-0.342***	-0.0871**
	(0.0545)	(0.0396)	(0.0515)	(0.0465)	(0.0382)
Matabeleland South	0.0901*	0.312***	-0.233***	-0.597***	-0.129***
	(0.0542)	(0.0396)	(0.0509)	(0.0537)	(0.0385)
Midlands	0.0891*	0.0742*	-0.0896*	-0.348***	-0.0451
	(0.0536)	(0.0405)	(0.0458)	(0.0443)	(0.0367)
Masvingo	0.0104	0.272***	0.178***	0.149***	0.0329
	(0.0557)	(0.0397)	(0.0436)	(0.0392)	(0.0370)
Constant	54.23*	-219.6***	-211.6***	-87.07***	344.6***
	(30.73)	(23.00)	(25.93)	(23.67)	(23.60)
Observations	39,112	39,140	39,100	39,157	39,220

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 19. Trends in severity of health-related shocks



Appendix 20. Probit estimates of year on year trends in the severity of health-related shocks

VARIABLES	Death breadwinner impact (I)	HIV/AIDS impact (II)	Diarrheal disease impact (III)	Malaria diseases impact (IV)	Health related impact (V)
Survey year is 2019 [1 if Yes, 0 if No]	1.018***	-0.253***	-0.0361	0.115	-0.126**
	(0.137)	(0.0671)	(0.0901)	(0.0763)	(0.0561)
Survey year is 2018 [1 if Yes, 0 if No]	0.707***	-0.165**	-0.317***	0.00669	-0.0811
	(0.109)	(0.0657)	(0.0889)	(0.0712)	(0.0513)
Household head is female [1 if Yes, 0 if No]	-0.118	-0.0321	0.0115	-0.0395	0.00601
	(0.111)	(0.0459)	(0.0588)	(0.0515)	(0.0469)
Household head age [Years]	0.000731	0.00298*	-0.00317	-0.00165	-0.00412***
	(0.00317)	(0.00168)	(0.00209)	(0.00178)	(0.00153)
Married living together	-0.779**	0.0140	0.217	-0.0647	0.168
	(0.325)	(0.137)	(0.200)	(0.165)	(0.147)
Married living apart	-0.753**	0.109	0.0782	-0.272	0.209
	(0.358)	(0.159)	(0.227)	(0.191)	(0.169)
Divorced/separated	-0.518	0.198	0.253	0.132	0.253
	(0.352)	(0.156)	(0.229)	(0.192)	(0.175)
Widow/widower	-0.111	0.181	0.302	-0.0669	0.172
	(0.323)	(0.142)	(0.214)	(0.179)	(0.153)
Primary level	-0.221*	0.00679	-0.0269	-0.189***	-0.200***
	(0.123)	(0.0623)	(0.0804)	(0.0671)	(0.0562)
ZJC	-0.101	0.0484	-0.0467	-0.254***	-0.170**
	(0.172)	(0.0816)	(0.104)	(0.0857)	(0.0785)
O' level	-0.199	-0.00964	-0.0888	-0.232***	-0.120*
	(0.170)	(0.0759)	(0.0917)	(0.0778)	(0.0731)
A' level	-0.174	-0.177	-0.316	-0.378	-0.336
	(0.663)	(0.315)	(0.320)	(0.300)	(0.303)
Diploma/Certificate after primary	-0.532	0.0621	-0.129	-0.0456	-0.316
	(0.527)	(0.431)	(0.478)	(0.383)	(0.263)
o.Diploma/Certificate after secondary	-				
Graduate/Post-Graduate	-0.348	-0.402		-1.127*	-0.272
	(0.954)	(0.452)		(0.627)	(0.294)
Household size	0.00889	-0.0248**	0.00873	-0.00183	-0.0231**
	(0.0208)	(0.0104)	(0.0137)	(0.0118)	(0.00928)
Household members with mental illness	-0.00736	-0.00978	0.0238	0.00889	0.0596
	(0.108)	(0.0467)	(0.0559)	(0.0480)	(0.0414)
Household members with chronic illness	0.0754	0.138***	0.0625	0.108**	0.119***
	(0.118)	(0.0438)	(0.0560)	(0.0497)	(0.0409)
Mashonaland Central	0.181	-0.278***	-0.464***	-0.676***	0.0574
	(0.222)	(0.104)	(0.111)	(0.0887)	(0.0848)
Mashonaland East	0.102	-0.284***	-0.225*	-0.285***	-0.0885
	(0.197)	(0.101)	(0.122)	(0.0931)	(0.0845)
Mashonaland West	-0.313*	-0.462***	-0.160	-0.294***	-0.156*
	(0.183)	(0.101)	(0.111)	(0.0985)	(0.0851)
Matabeleland North	0.471**	-0.276***	0.0549	-0.407***	-0.0249
	(0.225)	(0.0990)	(0.148)	(0.127)	(0.0907)
Matabeleland South	-0.167	-0.252**	-0.0452	-0.0430	0.0897
	(0.186)	(0.0989)	(0.147)	(0.157)	(0.0911)
Midlands	0.288	-0.289***	-0.0953	-0.308**	0.0738
	(0.212)	(0.104)	(0.127)	(0.121)	(0.0849)
Masvingo	-0.135	-0.239**	0.0483	-0.200**	0.108
	(0.204)	(0.1000)	(0.116)	(0.0976)	(0.0858)
Diploma/Certificate after secondary		0.119	-1.135**	-1.203***	-0.578**
		(0.349)	(0.493)	(0.397)	(0.240)
Constant	1.086***	0.401**	-0.209	0.404*	0.399**
	(0.402)	(0.188)	(0.249)	(0.207)	(0.179)
Observations	1,331	3,279	2,248	3,043	3,598

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

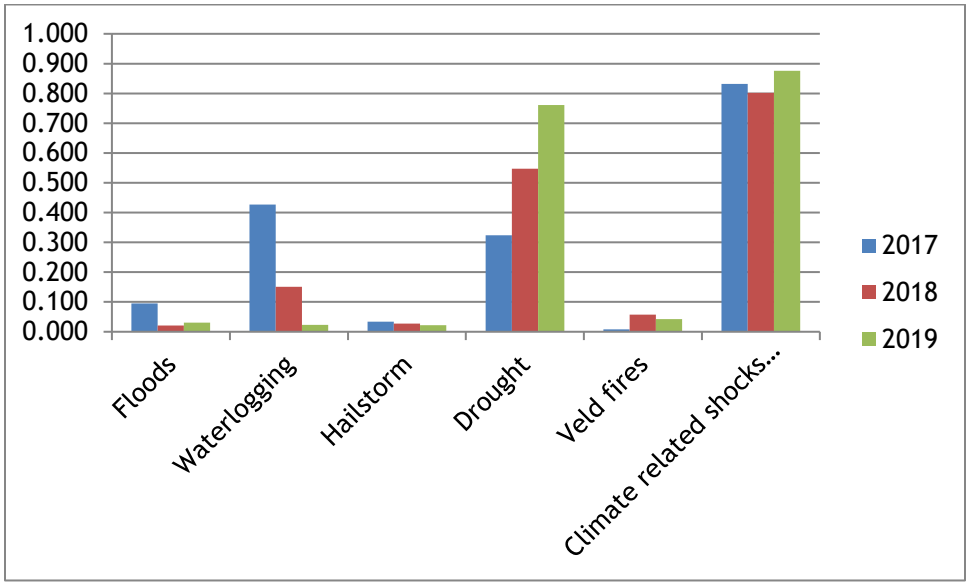
Appendix 21. Probit estimates of general trends in severity of health-related shocks

VARIABLES	Death breadwinner impact (I)	HIV/AIDS impact (II)	Diarrheal disease impact (III)	Malaria diseases impact (IV)	Health related impact (V)
Year	0.550***	-0.119***	0.0625	0.0686*	-0.0633**
	(0.0730)	(0.0320)	(0.0432)	(0.0367)	(0.0280)
Household head is female [1 if Yes, 0 if No]	-0.0698	-0.0345	0.0196	-0.0348	0.00576
	(0.114)	(0.0458)	(0.0587)	(0.0512)	(0.0469)
Household head age [Years]	0.000470	0.00295*	-0.00371*	-0.00169	-0.00413***
	(0.00318)	(0.00168)	(0.00209)	(0.00178)	(0.00153)
Married living together	-0.710**	0.0174	0.239	-0.0600	0.168
	(0.332)	(0.137)	(0.197)	(0.165)	(0.147)
Married living apart	-0.708*	0.111	0.0974	-0.269	0.209
	(0.364)	(0.159)	(0.224)	(0.191)	(0.169)
Divorced/separated	-0.492	0.201	0.284	0.141	0.254
	(0.357)	(0.156)	(0.226)	(0.192)	(0.175)
Widow/widower	-0.0867	0.183	0.330	-0.0634	0.172
	(0.327)	(0.142)	(0.211)	(0.179)	(0.153)
Primary level	-0.227*	0.00685	-0.0247	-0.190***	-0.200***
	(0.123)	(0.0623)	(0.0802)	(0.0671)	(0.0561)
ZJC	-0.124	0.0499	-0.0289	-0.253***	-0.169**
	(0.173)	(0.0816)	(0.104)	(0.0857)	(0.0784)
O' level	-0.227	-0.00916	-0.0863	-0.231***	-0.120
	(0.170)	(0.0759)	(0.0916)	(0.0778)	(0.0731)
A' level	-0.154	-0.179	-0.311	-0.378	-0.333
	(0.650)	(0.316)	(0.320)	(0.300)	(0.303)
Diploma/Certificate after primary	-0.485	0.0595	-0.216	-0.0420	-0.315
	(0.534)	(0.430)	(0.481)	(0.381)	(0.263)
Graduate/Post-Graduate	-0.434	-0.403		-1.132*	-0.276
	(0.954)	(0.454)		(0.630)	(0.294)
Household size	0.00604	-0.0243**	0.0175	-0.000463	-0.0229**
	(0.0204)	(0.0103)	(0.0136)	(0.0117)	(0.00926)
Household members with mental illness	-0.0103	-0.00945	0.0235	0.00835	0.0596
	(0.110)	(0.0467)	(0.0559)	(0.0481)	(0.0414)
Household members with chronic illness	0.0794	0.139***	0.0543	0.107**	0.119***
	(0.120)	(0.0438)	(0.0559)	(0.0496)	(0.0409)
Mashonaland Central	0.171	-0.276***	-0.535***	-0.686***	0.0559
	(0.221)	(0.104)	(0.110)	(0.0880)	(0.0847)
Mashonaland East	0.114	-0.284***	-0.326***	-0.299***	-0.0909
	(0.198)	(0.101)	(0.120)	(0.0921)	(0.0842)
Mashonaland West	-0.296	-0.461***	-0.216*	-0.309***	-0.156*
	(0.184)	(0.101)	(0.111)	(0.0974)	(0.0851)
Matabeleland North	0.483**	-0.280***	-0.0434	-0.421***	-0.0293
	(0.225)	(0.0989)	(0.147)	(0.126)	(0.0901)
Matabeleland South	-0.146	-0.253**	-0.0646	-0.0320	0.0880
	(0.187)	(0.0989)	(0.146)	(0.157)	(0.0909)
Midlands	0.287	-0.289***	-0.169	-0.320***	0.0730
	(0.210)	(0.104)	(0.126)	(0.121)	(0.0849)
Masvingo	-0.151	-0.238**	0.000169	-0.213**	0.106
	(0.205)	(0.1000)	(0.116)	(0.0968)	(0.0856)
Diploma/Certificate after secondary		0.115	-1.079**	-1.205***	-0.577**
		(0.348)	(0.499)	(0.397)	(0.240)
Constant	-1,108***	239.9***	-126.6	-138.0*	128.1**
	(147.3)	(64.51)	(87.12)	(74.09)	(56.51)
Observations	1,331	3,279	2,248	3,043	3,598

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 22. Trends in climate related shocks



Appendix 23. Probit estimates of year on year trends in climate related shocks

VARIABLES	Floods (I)	Waterlogging (II)	Hailstorm (III)	Drought (IV)	Veld fires (V)
Survey year is 2019 [1 if Yes, 0 if No]	-0.611***	-1.866***	-0.197***	1.214***	0.650***
	(0.0266)	(0.0275)	(0.0340)	(0.0176)	(0.0461)
Survey year is 2018 [1 if Yes, 0 if No]	-0.725***	-0.870***	-0.0996***	0.615***	0.796***
	(0.0303)	(0.0181)	(0.0324)	(0.0167)	(0.0451)
Household head is female [1 if Yes, 0 if No]	0.00609	0.0305	0.0221	-0.0141	-0.0465*
	(0.0260)	(0.0218)	(0.0292)	(0.0145)	(0.0265)
Household head age [Years]	8.11e-05	0.00544***	0.000690	0.000836*	0.00189**
	(0.000827)	(0.000598)	(0.000946)	(0.000478)	(0.000873)
Married living together	0.00116	0.0970	0.0539	0.104**	0.0475
	(0.0785)	(0.0628)	(0.0860)	(0.0430)	(0.0784)
Married living apart	-0.0905	0.114*	-0.0521	0.0809*	-0.0745
	(0.0878)	(0.0683)	(0.0980)	(0.0482)	(0.0913)
Divorced/separated	-0.0674	-0.0115	0.0588	0.0742	-0.0862
	(0.0927)	(0.0729)	(0.101)	(0.0508)	(0.0955)
Widow/widower	-0.0412	0.0482	0.0359	0.164***	-0.0591
	(0.0835)	(0.0660)	(0.0928)	(0.0462)	(0.0851)
Primary level	0.00814	0.123***	0.0709*	-0.0287	0.230***
	(0.0338)	(0.0243)	(0.0397)	(0.0195)	(0.0404)
ZJC	0.0127	0.225***	0.217***	-0.0701***	0.258***
	(0.0443)	(0.0322)	(0.0493)	(0.0256)	(0.0497)
O' level	-0.0381	0.174***	0.108**	-0.134***	0.226***
	(0.0406)	(0.0292)	(0.0468)	(0.0229)	(0.0465)
A' level	-0.112	0.129	0.0351	-0.314***	0.141
	(0.146)	(0.104)	(0.164)	(0.0794)	(0.152)
Diploma/Certificate after primary	0.0360	-0.143	0.0874	-0.388***	0.262
	(0.180)	(0.150)	(0.220)	(0.108)	(0.195)
Diploma/Certificate after secondary	-0.204	0.0118	-0.123	-0.394***	0.382***
	(0.145)	(0.0888)	(0.167)	(0.0709)	(0.126)
Graduate/Post-Graduate	0.0405	0.0926	0.0129	-0.392***	0.412**
	(0.176)	(0.140)	(0.212)	(0.104)	(0.161)
Household size	0.00345	0.0224***	0.00367	0.0418***	-0.00715
	(0.00551)	(0.00395)	(0.00612)	(0.00326)	(0.00611)
Household members with mental illness	0.0421	-0.0269	0.0365	0.00178	0.104***
	(0.0265)	(0.0211)	(0.0310)	(0.0159)	(0.0261)
Household members with chronic illness	0.0541*	0.0587**	0.0561	0.0892***	0.0386
	(0.0305)	(0.0237)	(0.0364)	(0.0187)	(0.0304)
Mashonaland Central	-0.737***	-0.258***	-0.235***	0.244***	0.687***
	(0.0520)	(0.0409)	(0.0648)	(0.0271)	(0.0690)
Mashonaland East	-0.714***	0.314***	0.0910*	0.181***	0.741***
	(0.0497)	(0.0359)	(0.0546)	(0.0259)	(0.0669)
Mashonaland West	-0.515***	0.235***	0.274***	-0.00668	1.108***
	(0.0479)	(0.0394)	(0.0546)	(0.0272)	(0.0667)
Matabeleland North	-0.241***	0.413***	0.241***	0.471***	0.493***
	(0.0418)	(0.0369)	(0.0547)	(0.0284)	(0.0719)
Matabeleland South	-0.218***	0.285***	0.256***	0.557***	0.445***
	(0.0422)	(0.0380)	(0.0556)	(0.0282)	(0.0741)
Midlands	-0.132***	0.591***	-0.0568	0.331***	0.581***
	(0.0388)	(0.0364)	(0.0592)	(0.0267)	(0.0695)
Masvingo	-0.246***	0.657***	0.129**	0.249***	0.111
	(0.0438)	(0.0373)	(0.0569)	(0.0281)	(0.0808)
Constant	-1.002***	-1.077***	-2.134***	-1.031***	-3.268***
	(0.0931)	(0.0769)	(0.108)	(0.0552)	(0.124)
Observations	39,222	39,503	39,230	39,451	39,141

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

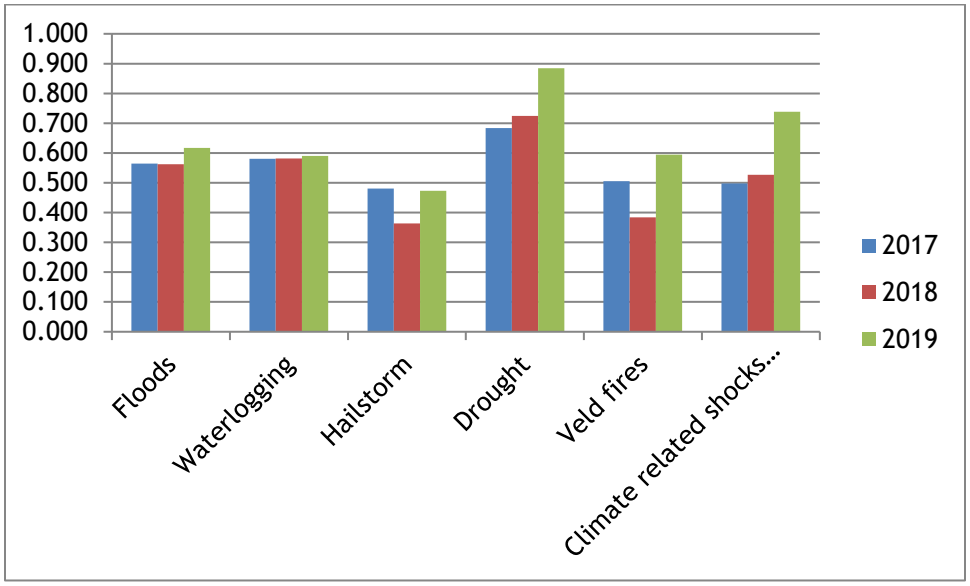
Appendix 24. Probit estimates of general trends in incidences of climate related shocks

VARIABLES	Floods (I)	Waterlogging (II)	Hailstorm (III)	Drought (IV)	Veld fires (V)
Year	-0.340***	-0.915***	-0.0986***	0.607***	0.205***
	(0.0157)	(0.0121)	(0.0170)	(0.00877)	(0.0145)
Household head is female [1 if Yes, 0 if No]	0.0333	0.0249	0.0222	-0.0146	-0.0769***
	(0.0281)	(0.0211)	(0.0291)	(0.0145)	(0.0258)
Household head age [Years]	-0.000187	0.00549***	0.000689	0.000845*	0.00227***
	(0.000823)	(0.000597)	(0.000946)	(0.000477)	(0.000849)
Married living together	0.0223	0.0925	0.0539	0.104**	0.0233
	(0.0778)	(0.0627)	(0.0860)	(0.0431)	(0.0773)
Married living apart	-0.0764	0.112	-0.0521	0.0806*	-0.108
	(0.0873)	(0.0681)	(0.0979)	(0.0482)	(0.0899)
Divorced/separated	-0.0440	-0.0151	0.0589	0.0736	-0.122
	(0.0918)	(0.0727)	(0.101)	(0.0508)	(0.0944)
Widow/widower	-0.0346	0.0478	0.0360	0.163***	-0.0826
	(0.0833)	(0.0658)	(0.0928)	(0.0462)	(0.0838)
Primary level	0.0139	0.122***	0.0709*	-0.0287	0.215***
	(0.0335)	(0.0243)	(0.0397)	(0.0195)	(0.0396)
ZJC	0.0316	0.222***	0.217***	-0.0703***	0.243***
	(0.0439)	(0.0322)	(0.0494)	(0.0256)	(0.0488)
O' level	-0.0296	0.173***	0.108**	-0.134***	0.211***
	(0.0403)	(0.0292)	(0.0468)	(0.0229)	(0.0456)
A' level	-0.103	0.128	0.0352	-0.314***	0.116
	(0.145)	(0.104)	(0.164)	(0.0794)	(0.149)
Diploma/Certificate after primary	0.0562	-0.148	0.0874	-0.389***	0.246
	(0.175)	(0.150)	(0.220)	(0.108)	(0.193)
Diploma/Certificate after secondary	-0.222	0.0152	-0.123	-0.393***	0.414***
	(0.141)	(0.0891)	(0.167)	(0.0709)	(0.123)
Graduate/Post-Graduate	0.0193	0.0947	0.0128	-0.391***	0.430***
	(0.175)	(0.139)	(0.212)	(0.104)	(0.159)
Household size	0.00796	0.0216***	0.00369	0.0417***	-0.0159***
	(0.00539)	(0.00393)	(0.00613)	(0.00326)	(0.00615)
Household members with mental illness	0.0537**	-0.0285	0.0365	0.00157	0.0909***
	(0.0266)	(0.0209)	(0.0310)	(0.0159)	(0.0257)
Household members with chronic illness	0.0437	0.0589**	0.0561	0.0893***	0.0432
	(0.0305)	(0.0235)	(0.0364)	(0.0187)	(0.0301)
Mashonaland Central	-0.753***	-0.258***	-0.235***	0.244***	0.679***
	(0.0511)	(0.0409)	(0.0649)	(0.0271)	(0.0674)
Mashonaland East	-0.716***	0.315***	0.0910*	0.181***	0.744***
	(0.0492)	(0.0360)	(0.0546)	(0.0259)	(0.0655)
Mashonaland West	-0.532***	0.235***	0.274***	-0.00656	1.101***
	(0.0471)	(0.0394)	(0.0547)	(0.0272)	(0.0651)
Matabeleland North	-0.263***	0.414***	0.241***	0.471***	0.501***
	(0.0414)	(0.0369)	(0.0550)	(0.0284)	(0.0703)
Matabeleland South	-0.228***	0.284***	0.256***	0.557***	0.428***
	(0.0420)	(0.0380)	(0.0556)	(0.0282)	(0.0723)
Midlands	-0.150***	0.592***	-0.0568	0.331***	0.586***
	(0.0385)	(0.0364)	(0.0592)	(0.0267)	(0.0682)
Masvingo	-0.258***	0.657***	0.129**	0.249***	0.124
	(0.0437)	(0.0372)	(0.0570)	(0.0281)	(0.0792)
Constant	684.7***	1,845***	196.7***	-1,225***	-415.5***
	(31.68)	(24.38)	(34.31)	(17.71)	(29.30)
Observations	39,222	39,503	39,230	39,451	39,141

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 25. Trends in climate change related shocks severity



Appendix 26. Probit estimates of year on year trends in climate related shocks severity

VARIABLES	Floods impact (I)	Waterlogging impact (II)	Hailstorm impact (III)	Drought impact (IV)	Veld fires impact (V)
Survey year is 2019 [1 if Yes, 0 if No]	-0.152	0.0404	-0.0400	0.729***	0.344**
	(0.103)	(0.0736)	(0.103)	(0.0282)	(0.152)
Survey year is 2018 [1 if Yes, 0 if No]	-0.0105	0.0237	-0.282***	0.125***	-0.242
	(0.0861)	(0.0345)	(0.100)	(0.0278)	(0.149)
Household head is female [1 if Yes, 0 if No]	0.00437	0.0412	0.0842	0.0500**	-0.145**
	(0.0733)	(0.0459)	(0.0863)	(0.0207)	(0.0711)
Household head age [Years]	0.000909	-0.00122	-0.00244	-0.00409***	-0.00343
	(0.00217)	(0.00111)	(0.00287)	(0.000708)	(0.00246)
Married living together	0.113	0.0525	0.117	0.136**	0.224
	(0.211)	(0.124)	(0.251)	(0.0631)	(0.226)
Married living apart	0.0278	0.0866	0.100	-0.0310	0.0841
	(0.235)	(0.134)	(0.286)	(0.0700)	(0.265)
Divorced/separated	0.140	0.0694	0.243	0.204***	0.345
	(0.251)	(0.143)	(0.295)	(0.0756)	(0.277)
Widow/widower	0.128	0.0591	0.232	0.188***	0.292
	(0.223)	(0.131)	(0.267)	(0.0674)	(0.247)
Primary level	-0.0622	-0.0251	0.0386	-0.198***	0.109
	(0.0879)	(0.0436)	(0.124)	(0.0292)	(0.111)
ZJC	-0.0239	-0.0695	-0.0331	-0.236***	0.0423
	(0.116)	(0.0568)	(0.149)	(0.0384)	(0.132)
O' level	-0.00210	-0.0735	0.0161	-0.320***	0.185
	(0.106)	(0.0526)	(0.143)	(0.0345)	(0.124)
A' level	0.162	-0.0750	-0.483	-0.162	0.0179
	(0.389)	(0.183)	(0.495)	(0.133)	(0.400)
Diploma/Certificate after primary	-0.664	-0.357	0.104	-0.628***	-0.0861
	(0.439)	(0.273)	(0.649)	(0.174)	(0.579)
Diploma/Certificate after secondary	0.693	-0.278*	-0.257	-0.639***	-0.100
	(0.443)	(0.161)	(0.568)	(0.109)	(0.302)
Graduate/Post-Graduate	0.296	-0.184		-0.214	-0.481
	(0.540)	(0.248)		(0.168)	(0.483)
Household size	0.00251	0.0324***	0.00962	0.0146***	-0.0268
	(0.0141)	(0.00697)	(0.0193)	(0.00476)	(0.0165)
Household members with mental illness	-0.0839	0.0825**	-0.0269	0.0107	0.0871
	(0.0617)	(0.0397)	(0.0836)	(0.0232)	(0.0648)
Household members with chronic illness	0.0788	-0.0640	0.0262	0.0630**	-0.00969
	(0.0739)	(0.0427)	(0.0871)	(0.0271)	(0.0774)
Mashonaland Central	-0.308*	-0.0784	0.319	-0.0244	-0.729***
	(0.178)	(0.0850)	(0.212)	(0.0440)	(0.229)
Mashonaland East	-0.704***	-0.270***	0.0484	-0.126***	-0.488**
	(0.158)	(0.0692)	(0.167)	(0.0429)	(0.225)
Mashonaland West	-0.427***	-0.180**	-0.0455	-0.253***	-0.384*
	(0.162)	(0.0745)	(0.164)	(0.0459)	(0.219)
Matabeleland North	-0.407***	0.0396	-0.241	-0.00970	-0.590**
	(0.143)	(0.0713)	(0.172)	(0.0432)	(0.241)
Matabeleland South	-0.490***	-0.0979	-0.120	-0.107**	0.107
	(0.134)	(0.0738)	(0.166)	(0.0431)	(0.246)
Midlands	-0.684***	0.0940	-0.132	-0.0682	-0.256
	(0.133)	(0.0676)	(0.187)	(0.0433)	(0.232)
Masvingo	-0.519***	-0.116*	0.0810	-0.185***	0.118
	(0.124)	(0.0677)	(0.172)	(0.0445)	(0.279)
o.Graduate/Post-Graduate			-		
Constant	0.520*	0.140	-0.118	0.735***	0.326
	(0.276)	(0.152)	(0.343)	(0.0844)	(0.350)
Observations	1,702	6,989	1,033	22,277	1,503

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Appendix 27. Probit estimates of general trends in severity of climate related shocks

VARIABLES	Floods (I)	Waterlogging (II)	Hailstorm (III)	Drought (IV)	Veld fires (V)
Year	-0.0621	0.0221	-0.0228	0.401***	0.392***
	(0.0474)	(0.0273)	(0.0521)	(0.0131)	(0.0618)
Household head is female [1 if Yes, 0 if No]	0.00334	0.0410	0.0867	0.0631***	-0.121*
	(0.0733)	(0.0459)	(0.0863)	(0.0204)	(0.0704)
Household head age [Years]	0.000877	-0.00122	-0.00249	-0.00425***	-0.00316
	(0.00217)	(0.00111)	(0.00285)	(0.000705)	(0.00246)
Married living together	0.110	0.0523	0.129	0.139**	0.222
	(0.210)	(0.124)	(0.254)	(0.0626)	(0.225)
Married living apart	0.0201	0.0865	0.0877	-0.0239	0.128
	(0.234)	(0.134)	(0.289)	(0.0696)	(0.264)
Divorced/separated	0.139	0.0692	0.282	0.218***	0.341
	(0.251)	(0.143)	(0.296)	(0.0752)	(0.275)
Widow/widower	0.125	0.0590	0.248	0.194***	0.287
	(0.222)	(0.131)	(0.269)	(0.0669)	(0.246)
Primary level	-0.0622	-0.0251	0.0436	-0.189***	0.120
	(0.0879)	(0.0436)	(0.124)	(0.0291)	(0.111)
ZJC	-0.0259	-0.0694	-0.00987	-0.219***	0.0504
	(0.116)	(0.0568)	(0.147)	(0.0383)	(0.133)
O' level	-0.00278	-0.0734	0.0231	-0.306***	0.223*
	(0.106)	(0.0526)	(0.143)	(0.0344)	(0.124)
A' level	0.157	-0.0749	-0.437	-0.145	0.0605
	(0.387)	(0.183)	(0.503)	(0.131)	(0.398)
Diploma/Certificate after primary	-0.660	-0.357	0.123	-0.627***	-0.121
	(0.436)	(0.273)	(0.668)	(0.172)	(0.560)
Diploma/Certificate after secondary	0.706	-0.277*	-0.245	-0.635***	-0.128
	(0.441)	(0.161)	(0.560)	(0.109)	(0.305)
Graduate/Post-Graduate	0.300	-0.184		-0.228	-0.471
	(0.542)	(0.248)		(0.167)	(0.475)
Household size	0.00222	0.0324***	0.0171	0.0175***	-0.0202
	(0.0141)	(0.00697)	(0.0191)	(0.00476)	(0.0164)
Household members with mental illness	-0.0855	0.0825**	-0.0149	0.0167	0.0919
	(0.0617)	(0.0397)	(0.0831)	(0.0230)	(0.0643)
Household members with chronic illness	0.0817	-0.0640	0.0169	0.0606**	-0.00754
	(0.0739)	(0.0427)	(0.0864)	(0.0267)	(0.0771)
Mashonaland Central	-0.273	-0.0782	0.271	-0.0431	-0.771***
	(0.170)	(0.0850)	(0.213)	(0.0438)	(0.230)
Mashonaland East	-0.682***	-0.269***	0.0109	-0.158***	-0.604***
	(0.155)	(0.0689)	(0.166)	(0.0424)	(0.225)
Mashonaland West	-0.391**	-0.180**	-0.0911	-0.291***	-0.489**
	(0.153)	(0.0743)	(0.163)	(0.0456)	(0.220)
Matabeleland North	-0.372***	0.0398	-0.355**	-0.0277	-0.673***
	(0.133)	(0.0713)	(0.168)	(0.0432)	(0.241)
Matabeleland South	-0.463***	-0.0977	-0.164	-0.124***	0.126
	(0.127)	(0.0737)	(0.166)	(0.0430)	(0.249)
Midlands	-0.652***	0.0944	-0.152	-0.0932**	-0.376
	(0.124)	(0.0674)	(0.186)	(0.0431)	(0.231)
Masvingo	-0.496***	-0.116*	0.0130	-0.182***	0.0438
	(0.119)	(0.0676)	(0.171)	(0.0444)	(0.280)
o.Graduate/Post-Graduate			-		
Constant	125.7	-44.43	45.74	-807.7***	-791.7***
	(95.60)	(55.01)	(105.0)	(26.43)	(124.7)
Observations	1,702	6,989	1,033	22,277	1,503

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

FNC is housed at SIRDC: 1574 Alpes Road, Hatcliffe, Harare

Tel: +263-242-862586/ +263-242-862025. Website: www.fnc.org.zw. Email: info@fnc.org.zw.

Twitter: @FNCZimbabwe. Instagram: fnc_zim. Facebook: @FNCZimbabwe