

Homestead Food Gardeners' Perceived Vulnerability to Poverty, Income Shocks and Entrepreneurial Activities in North West Province, South Africa

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Abstract

Poor households are faced with several challenges which affect their income generating activities. In the Ramotshere Moiloa Local Municipality, where this study was carried out, unemployment and food insecurity are prevalent. The respondents were selected using a multistep sampling method. The first stage involved selection of villages, where HFG are commonly found were randomly selected. In the second stage, a snowball sampling process was employed to identify and select people involved in homestead food gardening, lastly was to find a sample of 110 HFG. The study found that HFG were experiencing different shocks. The regression coefficients indicated that entrepreneurial income was significantly and positively affected by socio-economic characteristics and shocks while it was significantly and negatively affected by shocks and challenges. The marginal parameters of perceived vulnerability to poverty were significantly and positively affected by entrepreneurial activities. Socio-economic characteristics significantly and negatively affected marginal effects of perceived vulnerability to poverty. It can be concluded that farmers still need more training and awareness on how to run agricultural businesses as well as non-farm businesses for increased entrepreneurial income, improved welfare and limited likelihood of poverty and vulnerability. It was recommended that government to intervene in matters that arose from this study by providing more awareness, opportunities and training for people in the study area in order to reduce and prevent future poverty.

Keywords: Perceived vulnerability to poverty; HFGs; Entrepreneurial activities; Income shocks; Entrepreneurial income.



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1. Introduction

Homestead food gardening refers to small-scale agricultural production structure that provides plant and animal products that are either not accessible, affordable or readily available in retail markets (Galhena *et al.*, 2013). These are the small backyard gardens that are usually managed by households' members (Sthapit *et al.*, 2004). According to Sthapit *et al.* (2004), the role played by homestead food gardens is very vital for households' food security and enhancement of their nutritional status. This is also very critical in rural South Africa where poverty is predominant and households face a lot of idiosyncratic and covariate income shocks. South African government is also addressing these highlighted problems through some development programmes that support involvement of vulnerable and poor households in some small scale entrepreneurial activities.

The impact of entrepreneurial activities on vulnerability to poverty in South Africa is not well recorded in literature. Attention has been paid to poverty studies in order to recognize the well-being of rural households. However, poverty is static and cannot predict what will happen in the future in the way that vulnerability can. For that reason, this study focuses on perceived vulnerability to poverty. Recently, vulnerability has become an important concept in guiding the design, evaluation as well as targeting of programs and projects (Moret, 2014). Vulnerability refers to the inability to withstand the adverse shocks, while poverty can be defined as a condition in which people's income ability is inadequate to meet their basic needs as well as that of their families (Dercon, 2001). Vulnerability to poverty however looks at the probability of a household if currently non-poor to fall below the poverty line, and if currently poor, to remain in poverty (Chaudhuri, 2003). Since poverty cannot be traced, researchers in development economics have therefore stressed that it is very important to go beyond a static ex-post assessment of who is currently poor (poverty) to a dynamic ex-ante assessment of who will become poor in the future (vulnerability). For that reason, contrasting poverty, vulnerability can forecast the possibility of something happening in the future, which is an ex-ante assessment of poverty risk (Megersam, 2015).

According to Lechten and Felix (2008), it is possible for a household to move out of a vulnerable situation by having an increased level of income from good harvest, better paid work and remittances. Therefore, activities besides gardening are given attention in this study. An entrepreneur may be defined as someone who creates and owns his/her own enterprise, a risk taker who is innovative, enthused, determined and creative in transforming a situation into an opportunity (Weimer, 2008). Entrepreneurial activities in this study may be defined as farm and non-farm economic activities created to bring improved changes by creating additional income such as selling water, offering transportation services (own a taxi), repair of motor vehicles, own a small tuck-shop, and others, that are practiced by homestead food gardeners to generate supplementary income from so that they can reduce being

vulnerable to poverty. Similar to in most developing countries, small enterprises are there to respond to challenges linked to poverty by generating income to add on farm income.

Living in poverty involves a collection of resources which families should use to generate income. The majority of homestead food gardeners have insufficient income and is living in poverty. This in some way, forces them to engage in entrepreneurial activities in order to close the space of unsatisfactory income, vulnerability, poverty and failures in agricultural production. Therefore, it is essential to look at the kind of dealings or businesses that these gardeners are involved in as well as their asset ownership (Sccendi, 2013). Households make use of their assets to undertake wide range of income generating activities. Since access to adequate and updated information is a major constraint to homestead farmers, extension workers are the key sources of production and marketing information for the poor and vulnerable homestead food gardeners. Nevertheless, because of inadequate training, extension workers are not well-equipped to provide the required information to these poor households (Mbusi, 2013).

Factors such as infrastructure, access to finance, and social, physical as well as human capital affect the household's entrepreneurship (Dercon, 2001). Homestead food gardeners may be vulnerable to poverty because some of them do not have access to these assets. They are faced with high unemployment rates, and they lack access to assets and education (Mpandeli and Maponya, 2014; Oyekale and Oyekale, 2008). On the other hand, these poor farmers are still lacking access to credit. There are increased imperfect market conditions which they are unable to participate in. Thus, these adversely affect their food security status and expose them to poverty and vulnerability.

According to Baiyegunhi and Fraser (2010), the majority of the country's population is unemployed and is trying to make their living through agriculture. However, agriculture has its issues alone. South Africa is faced with increased levels of poverty as data of hungry people remains way too high. In addition, poor families are likely to be vulnerable to poverty; with little food production in their backyards which is one of the alternatives to assure that they have meals daily. According to Statistics South Africa (2008), R322 which is 'lower bound' poverty line revealed that 47.1% of South Africa's population was poor. Regarding R593 of which is 'upper bound' poverty line, it was revealed that 67.6% of South Africans were poor.

Regardless of a higher percentage of homestead food gardeners in South African provinces, there is lack of financial support and investment on food gardens as government funding often value commercial farmers (Jacobs, 2003).

The main objective of this study is to examine HFG's perceived vulnerability to poverty, income shocks and entrepreneurial activities in the North West Province, South Africa. The specific objectives are to: analyse the determinants of homestead farmers' incomes realized from entrepreneurial activities; and analyse the effect of entrepreneurial activities and income shocks' exposure on perceived vulnerability to poverty.

From the problems observed, it can be investigated by questioning the impact of entrepreneurial activities and income shocks on vulnerability and poverty in the North West Province. What are the demographic and socio-economic features of homestead food gardeners in the North West Province? What are the constraints and coping strategies encountered by homestead food gardeners of the North West Province in entrepreneurial activities they are undertaking? What are the determinants of homestead farmers' incomes realized from entrepreneurial activities? What are the determinants of perceived vulnerability and poverty?

2. Materials and Methods

2.1. Study Area

The study took place at Lehurutshe, a town in Ramotshere Moiloa Local Municipality in Ngaka Modiri Molema District Municipality in the North West province of South Africa. It is situated 26.6639°S and 25.2838°E. Villages such as Dinokana, Gopane, Motswedi, Borakalalo and Ntswelletsoku were visited. There are about 40,740 households, with an average household size of 3.6 persons per household (Statistics South Africa, 2011). Temperatures in the North West province range from 17° to 31 °C (62° to 88 °F) in the summer and from 3° to 21 °C (37° to 70 °F) in the winter. Annual precipitation amounts to 360 mm (about 14 in), with more or less all of it dropping during the summer months, i.e. between October and April.

Figure-3.1. Map of Ramotshere Moiloa Local Municipality



Source: <https://www.google.co.za/maps/place/Zeerust>

2.2. Research Design

The research used the quantitative methods so as to know the socio-economic and demographic features, determinants of entrepreneurial income and perceived vulnerability to poverty. Primary data was collected with well-structured questionnaire which was administered through face-to-face interviews. The population for the study included all the homestead food gardeners (whether involved in entrepreneurial activities or not) in the North West Province. Respondents in this study were selected using a multi-stage sampling method. The first stage involved random selection of villages, where HFG are commonly found. In the second stage, a snowball sampling process was employed to identify and select people involved in homestead food gardening, lastly was to find a sample of 110 Respondents were consulted and informed about the objective of the research study. Respondents' information was treated as confidential and the results were utilized for research purpose only

3. Method of Data Analysis

3.1. Descriptive Statistics

The descriptive statistics that was used includes tables, frequency and percentages. The descriptive statistics was used to analyse socio-economic and demographic features of the respondents, challenges, shocks they faced as well as their coping strategies

3.2. Perceived Vulnerability to Poverty

Probit Model: According to Amemiya (1985), Probit or Logit models are most appropriate for binary choice problem. He recommended using Probit model since the choice of continuous probability distribution for generating predictions cannot be theoretically vindicated. The Probit Model was used when the dependent variable Y (perceived vulnerability to poverty) are binary i.e. it can have only two possible outcomes which are indicated as 1 and 0 with a vector of explanatory variables (X). The explanatory variables (entrepreneurial activities and socio-economic characteristics) are assumed to influence the outcome i.e. perceived vulnerability to poverty (Y).

In order to analyse the determinants of perceived vulnerability to poverty, Probit model was used. The model took entrepreneurial activities, shocks and socio-economics characteristics of homestead food gardeners to consideration. The model can be specified as:

$$Y_i^* = x_i^T \beta + u_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \dots + \beta_n X_{in} + u_i \dots \dots \dots (1)$$

where X_{i1} to X_{in} are explanatory variables: vegetable farming (0=none, 1=Income in Rands), hairdressing (0=none, 1=Income in Rands), motor repairs (0=none, 1=Income in Rands), transport (0=none, 1=Income in Rands), hawkers (0=none, 1=Income in Rands), shoe repair (0=none, 1=Income in Rands), poultry (0=none, 1=Income in Rands), tuck shop (0=none, 1=Income in Rands), sell water (0=none, 1=Income in Rands), gender (0=female, 1=Male), age (In years), marital status (0=married, 1=otherwise), education level (none, primary, secondary, tertiary), religion (0=Christian, 1=otherwise), household size (Size in numbers), land (In hectares), employment status (0=employed, 1=unemployed) and years of experience (In years).

Representing the observed outcomes of binary choice by an indicator variable Y_i related to variable Y_i^* as follows:

$$Y_i = 1 \text{ if } Y_i^* > 0 \dots \dots \dots (2)$$

$$Y_i = 0 \text{ if } Y_i^* \leq 0 \dots \dots \dots (3)$$

Binomial probabilities $\Pr(Y_i = 1)$ and $\Pr(Y_i = 0)$ are represented in terms of standard normal cumulative distribution function $\Phi(Z)$:

$$\Pr(Y_i = 1) = \Pr(Y_i^* > 0) = \Phi(x_i^T \beta) = \Phi(\beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \dots + \beta_n X_{in}) \dots \dots \dots (4)$$

$$\Pr(Y_i = 0) = \Pr(Y_i^* \leq 0) = 1 - \Phi(x_i^T \beta) = \Phi(\beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \dots + \beta_n X_{in}) \dots \dots \dots (5)$$

$$\text{Marginal probability effect of } X_j = \Phi(x_i^T \beta) \frac{\partial(x_i^T \beta)}{\partial x_{ij}} = \Phi(x_i^T \beta) \beta_j \dots \dots \dots (6)$$

$$\text{The marginal parameters of } X_2 \text{ to } X_n = \Phi(x_i^T \beta) \frac{\partial(x_i^T \beta)}{\partial x_{i2}} = \Phi(x_i^T \beta) (\beta_2 + 2 \beta_3 X_{i2n} + \beta_n X_n) \dots \dots \dots (7)$$

3.3. Determinants of Entrepreneurial Income

Tobit regression model was employed to quantify the extent and direction of the impact of factors affecting entrepreneurial incomes among homestead food gardeners. A Tobit econometric model was applied in determining the factors affecting entrepreneurial income; and is specified in the equation below:

$$Y^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \mu \text{ I} \dots \dots \dots (8)$$

$$Y = 0 \text{ if } y \leq 0, y = Y^* \text{ if } y > 0 \dots \dots \dots (9)$$

Y^* = Homestead food gardeners entrepreneurial income

β s = estimated parameter or coefficient

X_i = Explanatory variables

μ = error term and is normally distributed with zero mean and constant variance.

The dependent variable i.e. entrepreneurial income (y) equals 0 if the latent variable y^* is below a certain threshold, usually 0. If the values of the latent variable are positive, the dependent variable is equal to the latent variable.

$$Y = \beta + x\beta + \mu, \mu / x \sim N, 0 \delta \dots \dots \dots (10)$$

$Y \text{ max}, 0 y = y$

The latent variable y^* in equation (13) satisfies the classical linear model assumptions ($y \text{ max}, 0 y = y$) in particular, it has a normal, homoscedasticity distribution with a linear conditional mean while equation (3) indicates

that the observed variable, y , equals y^* when $y^* \geq 0$, but $y=0$ when $y^* < 0$. Since y^* is normally distributed, y has a continuous distribution over strictly positive values. In particular, the concentration of y given x is the same as the density of y^* given x for positive values.

$$P(y = 0 | x) = P(y < 0 | x) = P(\mu < -x\beta) \dots \dots \dots (11)$$

$$P(\mu / \delta < -x\beta / \delta) = \Phi(-x\beta / \delta) = 1 - \Phi(x\beta / \delta) \dots \dots \dots (12)$$

Since μ / σ has a standard normal distribution and is independent of x ; the intercept is absorbed into x for notational simplicity (Cameron and Trivedi, 2005; Wooldridge, 2009). The maximum likelihood estimates for β and σ are obtained by maximizing the log-likelihood which is easily executed in Stata (Cameron and Trivedi, 2005). Tobit model for this study is as specified below:

$$Y = \beta + \beta X + \beta X + \beta X + \dots + \beta k Xk + \mu i \dots \dots \dots (13)$$

Where Y^* is the dependent variable (total of entrepreneurial income), and x is a vector of independent factors, and μ is the error term. The dependent variable is the total of different entrepreneurial income earned through sales formula while the explanatory variables are as specified below:

X1 = Gender of household head (0=male, 1=female), X2 =Age of household head (in years), X3= marital Status (0=married, 1=otherwise), X4= Education level (none, primary, secondary, tertiary), X5= Religion of household head (0=Christian, 1=otherwise), X6= Household size , X7=Land (ha) , X8= Employment status (0=employed, 1=unemployed), X9=Years of experience (0=yes, 1=no), X10=Training (0=yes, 1=no), X11=Lack market (0=yes, 1=no), X12=Crop diseases (0=yes, 1=no), X13=Soil degradation (0=yes, 1=no), X14=Water shortage (0=yes, 1=no), X15=Climate change (0=yes, 1=no), X16=Lack of storage (0=yes, 1=no), X17=Soil erosion (0=yes, 1=no), X18=Lack of finance (0=yes, 1=no), X19=Crop loss (0=yes, 1=no), X20=Drought (0=yes, 1=no), X21=Fire (0=yes, 1=no), X22=Cancer (0=yes, 1=no).

4. Results and Discussions

4.1. Socio-Economic Characteristics

Results in Table 1 show that 67.3% of the respondents were females compared to 32.7% males that were involved in homestead food gardening. The results indicate migration of men in the study area to urban areas to look for employment. According to ActionAid Report (undated), women are more likely to live in poverty due to inequalities. They have less power, money as well as the ability to protect themselves from violence. Regardless of these discriminations, women are standing up to claim their rights and fight poverty (ActionAid report, undated). The results of this study also revealed that 16.4% of the respondents were youth (under 36), 66.4% fell between 36 and 60 years of age and 17.2% were above 60. This indicates that there is still lack of youth participation in agricultural enterprises. According to Anyanwu (2013a), it was disputed that as old age escalates, poverty also escalates due to decreased levels of productivity of an individual and the possibility of having less savings.

Table-1. Descriptive: Selected Characteristics of Homestead Food Gardeners

Characteristic	Frequency	Percent
Gender		
Male	36	32.7
Female	74	67.3
Age		
Under 36	18	16.4
Between 36 and 60	73	66.4
Above 60	19	17.2
Population Group		
African	107	97.3
Coloured	1	0.9
Indian	2	1.8
Marital status		
Married	62	56.4
Single	37	33.6
Widowed	9	8.2
Divorced	2	1.8
Educational Status		
Primary	17	15.5
Secondary	45	40.9
Tertiary	38	34.5
Household size		
Under 5	20	18.2
Between 5 and 10	75	68.2
Above 10	15	13.6
Number of Dependents		
Under 5	65	59.1
Between 5 and 10	42	38.2

Above 10	3	2.7
Land (ha)		
Below 1ha	75	68.2
Between 1 and 2	33	30
Above 2	2	1.8
Employment status		
Employed	56	51
Unemployed	54	49
Income		
None	54	49.1
Below 20000 p/a	21	19
Between 20 000 and 70 000p/a	22	20
Above 70 000p/a	13	11.8

Source: Own Computatio

In a study conducted by Babu and Afera (2016), it was pointed out that households' vulnerability to poverty decreases as the age of the household head increases due to more skills acquired over the years as well as experience in farming activities. The results of this study revealed that 97.3% of the respondents were Africans, 0.9% coloured and 1.8% Indians. This indicates that the majority of people involved in HFG were Africans. The results in table 1 revealed that respondents that were married in the study area were 56.4%, 33.6% of those who were single, 8.2% of widows and 1.8% that was divorced. In a study conducted by Anyanwu (2013b), it was found that those households under polygamous marriages experienced higher levels of poverty and vulnerability, while those with one person showed the least incidence of poverty.

Since education helps in formation of skills that can result in higher productivity of labour as well as engagement in other compensating activities, household standard of living can be greatly affected by education (Yusuf *et al.*, 2011). In this study, education level refers to educational accomplishment of household head. When it comes to the educational status of the respondents, those who did not have education, left school at primary level, secondary and those who went to tertiary were 15.5% (17), 40.9% (45) and 34.5% (38), respectively. Attainment of lower levels of education can be associated with unemployment, low income and poverty (Poswa, 2008). The higher the education levels of an individual, the lesser their chances of getting into poverty. In the case of South Africa, that is not the case due to the fact that majority of the individuals have higher levels of education, nevertheless for employment is not the same as the municipality is faced with higher levels of unemployment.

Household size has different impacts on the welfare of households. It is expected for households with large sizes to be more vulnerable to poverty compared to those with small numbers; the same applies to number of dependents. In this study, the results in Table 1 indicated that households that had less than five people were revealed to be 18.2%, those between 5 and 10 were 68.2% and those above 10 made 13.6% of the respondents. According to Babu and Afera (2016), it was found out that dependency ratio has a positive relationship on the household's vulnerability to poverty.

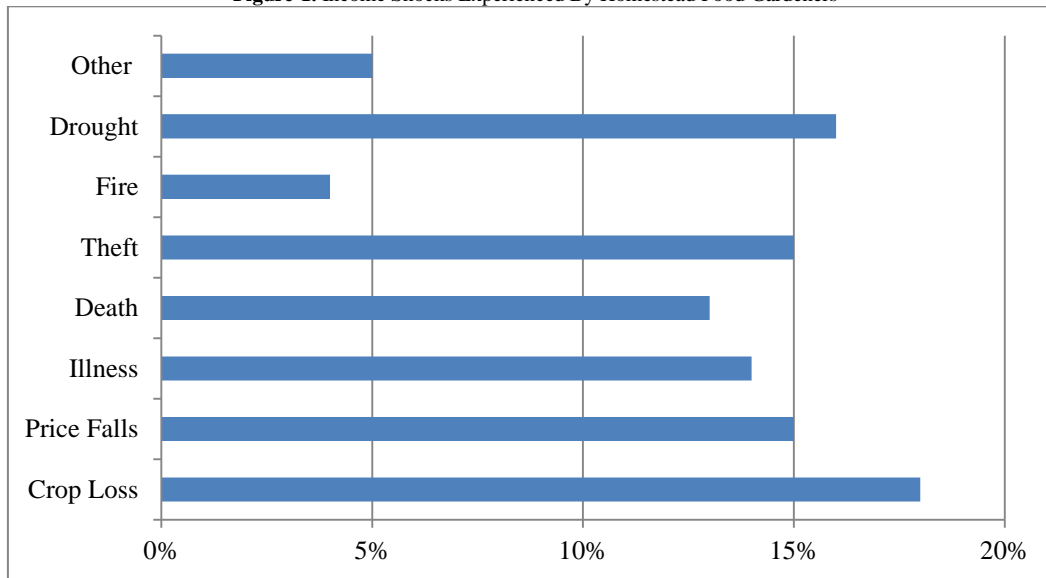
Results in Table 1 revealed that 59.1% fell under less than five dependents, 38.2% between five and ten and 2.7% above ten dependents. The HFG also mentioned that people between the ages of 14-64 years had higher levels of vulnerability due to the fact that the large number of dependents increases the burden of active household members having to take care of them. It can be expected of households with more land to be less vulnerable to poverty while those that have small piece of land can be expected to be vulnerable to poverty. However, it may be argued that land size does not matter, what matters is the land fertility. The results in Table 1 revealed that homestead food gardeners that had land size below 1 hectare of land were 68.2% of the sample, those between 1 and 2 hectares 30% (33) and above 2 hectares 1.8%.

Unemployed individuals lack financial stability, as a result cannot participate in social endeavours leading to being in poverty. They usually have a lower standard of living than those who are employed (Agbaje *et al.*, 2013). In this study, the results in Table 1 showed that a percentage of employed family members were 51% and 49% were unemployed. According to Ndobbo (2013), household income is the total monthly income of households from all sources. Contrasting this definition, the study observed annual income from employment and it was realized in Table 1 that 49.1% was earning nothing from employment while those who were employed (19%) earned below R20000 per annum, 20% earned between R20000 and R70000 per annum and 11.8% of those who earned above R70000 per annum.

4.2. Income Shocks Experienced by the Respondents

Figure 1 below presents the results on the shocks that were experienced by homestead food gardeners over the past one year. It was revealed that 15% of the respondents experienced theft of their assets and garden crops. It also showed that 4% experienced fires outbreak due to electricity shocks, and 16% were affected by drought as they did not have access to water and water that was provided by government stopped running on daily basis but on certain days. Consumers were also affected by high prices. It was also revealed that 18% of the respondents lost their crops due to drought and getting more sunlight than they should.

Figure-1. Income Shocks Experienced By Homestead Food Gardeners



Source: Own Computation

Price falls of agricultural products affected 15% of homestead food gardeners as they stopped gaining profit and running at a loss which could have an adverse impact on their current and future poverty. People in poverty suffer from hunger and starvation, and are prone to diseases (Pogge, 2010). Illness in the families affected 14% which drains labour, since they can no longer work effectively or work at all. Food nutritional requirements will be high forcing the family members to buy more expensive and nutritious food as well as forcing them to sell their assets which could help in generating income to spend money on medication and clinic/doctor visits. Death of household members was experienced by 13% of the respondents. Some of the family members who died were bread winners and 5% of the respondents were faced with other shocks such as their children being cut-off the grants, having to pay bail to release family members from jail, having to organize and pay for funerals, etc. The results of this study reject the second hypothesis because the probability of being poor is influenced by exposure to welfare shocks.

4.3. Coping Strategies Applied by Homestead Food Gardeners

Coping strategies are those actions that are taken by individuals or households to minimize or stand traumatic occasions. The results in Table 2 below show the coping strategies that were employed by the homestead food gardeners to deal with the shocks they experienced. It was revealed that 60% were looking for piece jobs. While 27.3% received government food which they applied for. For those who substituted their meals (62.7%), they had to buy much cheaper food to substitute the usual and that can have a negative impact on their nutritional status as well as future poverty.

Table-2. Coping Strategies Used By Homestead Food Gardeners

Coping Strategy	Frequency	Percent
Piece Job	66	60
Government Food	30	27.3
Substitute Meals	69	62.7
Reduce Meals	42	38.2
Government grants	69	62.7
Reduce Household Items	23	20.9
Informal Borrowing	29	26.4
Formal Borrowing	43	39.1
Pull children out of School	2	1.8
Vending	38	34.5
Sale of Assets	28	25.5
Ask Friends	36	32.7
Help from Religious Organizations	31	28.2

Source: Own Computation

Respondents who reduced meals a day make (38.2%). This shows that meals per day were not affected that much by the income shocks experienced since the minority reduced their meals. Government grants are there to take care of the less fortunate and the results have shown that majority of the respondents were using them (62.7%). Household items were found to have affected smaller households because only 20.9% reduced household items like soap, snacks etc. Households that were informally borrowing from neighbours and relatives were 26.4% of the households and formal lending from banks and loan sharks (39.1%). The results in Table 2 showed that 1.8% of the respondents pulled children out of school. Vending (34.5%), sale of assets (25.5%), were asking from friends

(32.7%) and those who got help from religious organizations (28.2%). This confirmed that homestead food gardeners are doing something about the shocks they face.

4.4. Determinants of Entrepreneurial Income

To examine the factors affecting entrepreneurial income Tobit regression model was used. The results are summarised in Table 3. The model showed a good fit between the dependent and explanatory variables with a log likelihood of -1019.74, likelihood ratio of 81.07, ($p < 0.01$). The computed VIF related individually to the predictors indicated small VIF values ranging from 1.16 to 1.64 which revealed the absence of multicollinearity among the explanatory variables.

Table-3. Determinants of Entrepreneurial Income

Variables	Coefficient	t Values	Significance Level	VIF
Constant	1810.675	0.49	0.623	1.40
Gender	-1149.34	-0.94	0.352	1.41
Age	79.19	1.85	0.068*	1.64
Marital Status	-151.899	-0.14	-0.893	1.30
Education	1452.007	1.05	.0296	1.46
Religion	-5887.34	-2.56	0.012**	1.55
Household Size	474.1623	2.37	0.020**	1.58
Land(ha)	-3.379724	-0.45	0.653	1.23
Employment Status	-1498.327	-1.34	0.183	1.31
Years of Experience	300.3032	2.31	0.023**	1.48
Training	1651.566	1.48	0.143	1.16
Lack Market	137.4161	0.12	0.906	1.33
Crop Diseases	2241.196	1.87	0.065*	1.48
Soil Degradation	-3578.23	-3.11	0.003***	1.32
Water Shortage	2366.566	2.04	0.045**	1.27
Climate Change	2313.068	2.04	0.045**	1.19
Lack of Storage	-1840.14	-1.67	0.100	1.25
Soil erosion	4097.671	3.76	0.000***	1.23
Lack of Finance	-2881.93	-2.43	0.017**	1.46
Crop Loss	3564.526	2.88	0.005***	1.58
Drought	-2337.372	-1.84	0.070*	1.57
Fire	1305.758	0.62	0.534	1.51
Cancer	-1006.085	-0.35	0.724	1.50
LR Chi ² (22)	81.07			
Prob >Chi ²	0.0000			
Pseudo R ²	0.0382			

Source: Own Computation

*Significant at 10%, **significant at 5% and ***significant at 1%

The results in Table 3 indicated that entrepreneurial income was affected by age of a household head ($t=1.85$), religion of a household head ($t=-2.56$), household size ($t=2.37$), and years of experience ($t=2.31$), crop diseases ($t=1.87$), soil degradation ($t=-3.11$), water shortages ($t=2.04$), climate change ($t=2.04$), soil erosion ($t=3.76$), and lack of finance ($t=-2.43$), crop loss ($t=2.88$) and drought ($t=-1.84$). It was revealed in Table 3 that age affected entrepreneurial income positively. It was revealed that an increase in age by 1 year resulted in an increase in entrepreneurial income by R79.19. The results are in line with that of Olale and Hensonm (2013), who revealed that the age of the household head is positively associated with income from non-agricultural activities. The results in Table 3 also revealed religion as a determinant of entrepreneurial income ($p < 0.05$). The results revealed a negative relationship between religion and entrepreneurial income. As a number of Christians increase by one member, entrepreneurial income decreased by R5 887.34. It was mentioned in a study conducted by Janowski and Bleahu (2002) that religion can have both negative and positive implications. Despite the fact that it can provide resources for building up connections which may help in livelihood activities (Janowski and Bleahu, 2002), it also limits income generating activities.

The results of this study are also supported by a study conducted by Lipford and Tollison (2003), who revealed that religion has been further advanced by economists on the understanding of human behaviour. They found out that religion slightly decreases level of income as it sticks to principles on preferences towards afterlife consumption as well as discouraging acquiring material wealth. The results in Table 3 revealed a positive relationship between an increase in household size and entrepreneurial income. It was revealed that as household size increased there was also an increase in entrepreneurial income by R474.16 ($p < 0.05$). The results are not in line with that of Yunez-Naude and Taylor (2001), who found out that an increase in family size decreases income. However, a study conducted by Wourterse and Taylor (2008), is in line with the results of this study. They found out that larger family sizes were associated with higher levels of primary crop income.

In addition, that makes the connection between entrepreneurial income and household size ambiguous. In contradiction with the results is a study conducted by [Ozigbo and Udah \(2015\)](#) and [Xaba and Masuku \(2013\)](#), who revealed that smaller household sizes expect increased income from crop sales. They further reasoned that in greater family sizes, greater portion of produce goes to them and may discourage selling because the farmer has to supply the household consumption needs before selling. [Ovwigbo \(2014\)](#), also mentioned that an increase in household size increases number of non-farm income generating activities. The years of experience involved in entrepreneurial activity significantly affected entrepreneurial income ($p < 0.05$). The results in [Table 3](#) revealed that an increase in experience by 1 year resulted in an increase in entrepreneurial income by R300.32. The results of this study are in line with that of [Xaba and Masuku \(2013\)](#), who revealed that as farmers become more experienced in production and marketing of vegetables through their involvement, their possibility of participating in profitable businesses will be higher, resulting in more profits. The results of this study revealed that socio-economic characteristics of HFGs influence entrepreneurial income. Therefore the fifth hypothesis of this study is rejected.

Various crop diseases affected entrepreneurial income among HFGs. The results in [Table 3](#) revealed that crop diseases increased entrepreneurial income by R2 241.196 ($p < 0.1$). The results of this study are in conflict with a study conducted by [Harvey et al. \(2014\)](#) who revealed that farmers were regularly exposed to pests and diseases outbreak which caused major crop and income losses. The results in [Table 3](#) revealed that, soil degradation has a negative influence on entrepreneurial income ($p < 0.01$). The more soil degraded, the less entrepreneurial income was earned, it decreased by R3 578.23. The results are in line with that of [Oladeji \(2016\)](#), who also found out that there was a significant difference in income generating activities of farmers' before and after land has degraded.

Moreover, the results of this study support the views of [Uzokwe \(2000\)](#), who indicated that soil degradation adversely affect production level, food security as well as income level and socio-economic status of farmers. The results in [Table 3](#) revealed that, water shortages increased with entrepreneurial income by R2 366.57 ($p < 0.05$). The results of this study are supported by [Ovwigbo \(2014\)](#), who indicated that the majority of farmers engage in different secondary income generating activities to prevent falling short in income during low production seasons. Climate change is one of the factors that affected entrepreneurial income ($p < 0.05$). It was revealed that a change in climate increased entrepreneurial income by R2 313.07. The results of this study are in line with that of a study conducted by [Bobojonov and Aw-Hassan \(2014\)](#), who revealed that farm income was expected to increase under climate change circumstances. They further explained that expected increase in temperature as well as precipitation may create more favourable conditions for production and yields which has additional possibilities to increase farm income in the future.

Soil erosion forms a part of the major threats to agricultural production as it can lead to reduced crop yields that will threaten farmers' level of income [Borrelli et al. \(2016\)](#). However, in this study it was revealed in [Table 3](#) that soil erosion affected entrepreneurial income positively ($p < 0.01$). The results revealed that soil erosion increased with entrepreneurial income by R4 097.671. The results of this study are different from that of [Hediger \(2003\)](#), who found that in the long run, soil erosion will result in decline in production, resulting in lower agricultural yields and income. Lack of finance is one of the factors that affected entrepreneurial income. The results in [Table 3](#) revealed that an increase in poor finance resulted in a decrease in entrepreneurial income by R2 881.93 ($p < 0.05$). According to [Tsyganova and Shirokova \(2010\)](#), availability of financial capital is one of the main issues when starting and growing business.

The results in [Table 3](#) revealed that an increase in crop loss resulted in an increase in entrepreneurial income by R3 564.53 ($p < 0.01$). The results of this study are supported by that of [Seng \(2015\)](#), that farmers reported damage to their crops due to excessive rainfall, birds and drought. Adding to agricultural production profits, other sources of income from non-farm activities such as self-employment and salary paid employment contribute positively to households' level of income. Drought affected entrepreneurial income in this study. The results in [Table 3](#) revealed a negative relationship between drought and entrepreneurial income. It was discovered that an increase in drought decreased entrepreneurial income by R2 337.37 ($p < 0.1$). The results of this study are in line with that of a study conducted by [Goodwin and Smith \(2013\)](#), who indicated that farm income diminished due to drought. Exposure to welfare shocks significantly influence entrepreneurial income in this study. Therefore, the fourth hypothesis of this study is rejected.

4.5. Determinants of Perceived Vulnerability and Poverty

The marginal parameters of perceived vulnerability to poverty are presented in [Table 4](#) below. To measure the impact of entrepreneurial activities on vulnerability and poverty, the results of this regression analysis included entrepreneurial activities. Applying the method detailed in the methodology, perceived vulnerability to poverty was measured in [Table 4](#) The model shows a good relationship between the dependent and independent variables with a log likelihood of -47.260038, LR =42.97, $p < 0.0005$. Perceived vulnerability to poverty were significantly affected by factors such as an entrepreneurial activity of offering transport services by a family member ($z=2.43$), poultry by a family member ($z=1.66$), marital status of household head ($z=-1.79$), educational level of household head ($z=-3.47$) as well as household size ($z=-2.87$).

Table-4. Determinants of Perceived Vulnerability and Poverty

Variables	Coefficient	t Values	Marginal Effects	Significance Level
Constant	5.042074	3.76	.0000231	0.000
Vegetable Farming	.0000758	1.24	-.0000333	0.216
Hairdressing	-.0001091	-0.61	.0000177	0.543
Motor Repairs	.0000582	0.56	.000122	0.575
Transport	.0004004	2.02	-.0000248	0.043**
Hawker	-.0000814	-0.93	.0000611	0.353
Shoe Repair	.0002006	1.09	.0000499	0.274
Poultry	.0001639	1.70	.0000244	0.090*
Tuck Shop	-.0000802	-1.14	.1526295	0.254
Gender	.541795	1.46	-.0051914	0.145
Age	-.0170391	-1.20	-.1671868	0.231
Marital Status	-.5649123	-1.76	-.3027632	0.079*
Education	-1.35558	-2.74	-.1970804	0.006***
Religion	-.9259629	-1.05	-.0612091	0.293
Household Size	-.2008972	-2.87	-.0988116	0.004***
Land(ha)	-.3243138	-1.09	.0961391	0.277
Employment Status	.3154759	0.89	-.0161809	0.375
Years of Experience	-.0531079	-1.10		0.271
Log Likelihood	-47.260038			
LR chi2(17)	42.97			
Prob> chi2	0.0005			
Pseudo R2	0.3125			

Source: Own computation

*Significant at 10%, **Significant at 5%, ***Significant at 1%

Transport as an entrepreneurial activity affected perceived vulnerability to poverty. It was revealed in Table 4 that offering transport services increases perceived vulnerability to poverty ($p < 0.05$). The results revealed may hint at competition, i.e. the more transport services offered, the smaller the income earned and increased perceived vulnerability to poverty. It is revealed in Table 4 that poultry had a positive relationship on the marginal parameters of perceived vulnerability to poverty. As poultry ownership increases, perceived vulnerability to poverty also increased ($p < 0.1$).

It was revealed in Table 4 that marital status had a negative influence on the marginal parameters of perceived vulnerability to poverty. It was revealed that the likelihood of married people to fall into future poverty is 17% lower than for unmarried people ($p < 0.1$). The results of this study are in line with that of Adepoju and Okunmadewa (2011), who found that marital status (being married) reduced vulnerability to poverty. The simplicity of sharing risk and combining resources together as well as catering for households' needs in cooperation was provided as a possible reason. Educational level was another factor that affected the marginal parameters of perceived vulnerability to poverty. It was revealed in Table 4 that an increase by one level in education resulted in a decrease on marginal parameters of perceived vulnerability to poverty ($p < 0.01$). The results of this study are in line with a study conducted by Hanna (2004), who also revealed that higher levels of education reduce possibility of being poor. It was revealed in Table 4 that religion had a negative influence on the marginal parameters of perceived vulnerability to poverty. It was indicated by the results in Table 4 that growth in religion resulted in a decrease in marginal parameters of perceived vulnerability to poverty ($p < 0.1$). It was also discovered by the results in Table 4 that household size had a negative influence on perceived vulnerability to poverty. It was revealed that an increase by one member in household resulted in a decrease in marginal parameters of perceived vulnerability to poverty ($p < 0.01$). The results of this study are in line with that of Megersam (2015), who revealed that as households size increases, so does the workforce. As a result, there will be less incidence of probability of households to be vulnerable to poverty. The results of this study reject the third hypothesis of this study due to the fact that entrepreneurial activities influence perceived vulnerability to poverty.

5. Conclusions

In conclusion, it can be decided that the issue of women empowerment is achieved in this study area. The main issues that still need attention include education, which can make a difference on problems such as being able to make informed decisions as well as taking calculated risks that will decrease chances of falling into poverty. With regard to constraints, the main problems include market access, crop diseases, soil degradation, post-harvest management, storage facilities, theft, finance, incentive, knowledge and resources. Crime, climate change and knowledge are responsible for these constraints due to the fact that theft reduces resources, knowledge affects management of produce after being harvested as well as lack of incentive and climate change grounds crop diseases, market access as the quantity and quality of HFG will not meet the market requirements. Storage facilities are a result of poor support for HFG.

Shocks have a great impact on vulnerability to poverty status of HFG. However, from the results of this study it is indicated that HFG are not just sitting around and doing nothing about that problem. They are trying by all means

to mitigate future poverty by doing all the accomplishments mentioned earlier in this study. Entrepreneurial income was revealed to have been affected by numerous factors. Hence, it can be concluded that farmers still need more training and awareness on how to run an agricultural business as well as non-farm businesses for increased entrepreneurial income and limited likelihood of poverty and vulnerability.

Factors affecting vulnerability to poverty were observed in this study and clarified. The results as far as this study is concerned make sense. Therefore, HFG can learn from them as well as trying all techniques available to avoid them. Entrepreneurial activities had a negative relationship on perceived vulnerability to poverty due to various factors. Meaning HFG are not yet where they are supposed to be in making profits, acquiring skills and assets they need to improve their status regarding future poverty. It was revealed by the results of this study that entrepreneurial activities, education level and age of household heads had a positive influence on relative and absolute poverty. In brief, it can be said that entrepreneurial activities are assisting HFG to operate daily and have their needs met. However, that does not secure their poverty status in the future. Entrepreneurial activities revealed an encouraging situation on both relative and absolute poverty. Therefore, it can be concluded that non-farm generating activities reduce relative and absolute poverty.

Recommendations

Socio-economic Characteristics of HFGs

- More youth should be encouraged to participate in homestead food gardening as this will assist young people with farming skills while they are still young and lively to do the work. This could also promote young black commercial farmers. In addition, information on funding programs should be provided to make youth aware and more interested in farming.
- With regard to HFG's educational level, majority (40.9) had secondary level. They could not further their studies due to financial constraints. Therefore, it is recommended that government, state-owned entities as well as private companies to provide bursaries to dedicated and deserving individuals and information on how to access those bursaries. This will assist in improving scarce skills, improve livelihoods and will assist HFGs in making sound decisions as well as being able to solve cost-effective problems.

Income Shocks Faced by HFGs

- Other measures that can empower HFG should be established. The number of healthcare facilities that are close should be taken extremely serious as they adversely affect the HFG vulnerability to poverty.
- HFGs should form unions or associations in order to address these shocks and advice each other on the shocks they experience and how they deal with them.

Constraints Faced by HFGs

- Government needs to assist HFGs in finding/accessing markets that are well established as this will assist them to expand their production and not to rely on pension days and surrounding communities. Moreover, HFGs will get improved profit on their production and find the courage to produce more quantity and quality leading to HFGs meeting market requirements and attracting global market.
- Regarding soil degradation, HFGs should be advised by extension officers to apply the correct amount of fertilizers, humus or organic matter as well as practising crop rotation. This will assist in rejuvenating the soil and more production will be achieved.
- Water tanks and water/boreholes should be provided to minimize water shortages. Awareness on climate change adaptation strategies/techniques should be provided by extension officers.
- Government should invest in post-harvest technologies, storage facilities as well as training HFG on managing their produce. This will assist in minimizing post-harvest losses and covering HFGs cost of production.
- Infrastructural developments such as transportation, roads as well as fencing should be prioritized. This will assist in reducing theft, crop losses and destruction of HFGs property.

Entrepreneurial Income

- Government should enforce intensive care (monitoring), reporting on poverty alleviation programs carried out whether they achieved their goals as well as taking sustainability into consideration e.g. After giving HFG equipment they should be taught how to use it effectively and efficiently and make sure they will not sell that equipment through policy creation. The programs should also consist of accountability of parties involved in implementation.
- Moreover thorough mentoring and training on entrepreneurship should be carried out. Lastly, involvement of black people in the economy should be prioritized for equality as well as a growing economy. In addition, poverty alleviation programs and policies should consider prevention of future poverty. This should include the non-poor as they could increase the number of poverty levels in the future.
- Change or transformation begins with positive, energetic and passionate approach. It is also recommended to HFG to participate in various entrepreneurial activities as they have the capability of eliminating current and future poverty as well as acquiring more knowledge and skills to enhance their vulnerability to poverty status. Information on funding programs in the agricultural sector could be made available to farmers as well as helping

them to access such funds. It is also the extension officers' duty to inform farmers on how to deal with drought and about drought resistant seeds and crops.

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