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Determinants of Household Poverty Dynamics in Rural Regions of the Eastern Cape Province, South Africa

By

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Abstract

Poverty has always been studied in a world of certainty. However, if the aim of studying poverty is not only improving the well-being of households who are currently poor, but also preventing people from becoming poor in the future, a new forward looking perspective must be adopted. For thinking about appropriate forward-looking anti-poverty interventions (i.e. interventions that aim to prevent or reduce future poverty rather than alleviate current poverty), the critical need then is to go beyond a cataloging of who is currently poor and who is not, to an assessment of households' vulnerability to poverty. This study analyses a panel dataset on a representative sample of 150 rural households interviewed in 2007 and 2008 in the Amathole District Municipality of the Eastern Cape Province to empirical assess the dynamics of poverty and estimate the determinants of households' vulnerability to poverty. The result of the study indicates that the number of vulnerable households is significantly larger than for the currently poor households; the vulnerability index was found to be 0,62 compared to 0,56 headcount index in 2008. This implies that while 56 percent of the sampled households are poor (*ex post*) in 2008, 62 percent are vulnerable to becoming poor (*ex ante*) in future. The result of the Probit model shows that the age, level of education and occupation of the household head, dependency ratio, exposure to idiosyncratic risks and access to credit are statistically significant in explaining a households' vulnerability to poverty.

Keywords: Poverty, vulnerability, poverty dynamics, risks, rural households.

1 Introduction

Despite South Africa's upper-middle-income country status (GDP per capita is approximately $13, 300) (CIA World Factbook 2008), many South African households are living in outright poverty or at the very least are vulnerable to becoming poor. According to estimates of poverty generated by the Human Sciences Research Council (HSRC, 2004), the percentage of the populace in South Africa still living in poverty has not changed significantly since the advent of democratic governance in 1994. The gap between rich and poor rather than abating has continued to widen, thus, many households have sunk deeper into poverty. There are suggestions that the major issue is not that households are poor but the probability that a household if currently poor, will remain in poverty or if current non-poor will fall below the poverty line (Quisumbing, 2002). In other words, it is vulnerability to poverty that explains the ever-increasing level of poverty.

The high incidence of poverty in South Africa, despite myriads of government interventions and activities of Non-Governmental Organization (NGOs) to reduce it through poverty alleviation/reduction programs and projects has brought the issue of vulnerability to the attention of policy makers. This failure of government programs and strategies to lower the incidence of poverty in South Africa bears a strong testimony to two main issues. Firstly, the government might be lacking in capacity to mitigate the social risks faced by households and communities; secondly, the government might not be paying serious attention to the issue of risk and

uncertainty that are crucial for the understanding of the dynamics leading to and perpetuating poverty.

Households in South Africa as in many developing countries are frequently confronted by severe idiosyncratic risk (i.e. household-level shocks, such as human illness, death, injury, unemployment, job loss, asset loss, crop pest and diseases) and covariate risks (i.e. community shock such as natural disaster or epidemics), resulting in high income volatility. The social mechanisms to mitigate the effects of these risks are usually very underdeveloped (Kevane, 1996). Whether or not a household is poor has been widely recognized as an important indicator of a household's well-being. However, today's poor household may or may not be tomorrow's poor. Households that are currently non-poor, but face a high probability of an adverse shock, may on experiencing such shocks, become poor tomorrow. And the currently poor households may include some who are only transitorily poor as well as others who will continue to be poor (or poorer) in the future. In other words, a household's observed poverty status[1] is an ex-post measure of a household's well being (or lack thereof). But what really matters for many policy purposes is the ex-ante risk that a household will, if currently non-poor, fall below poverty line, or if currently poor, will remain in poverty. And the current poverty status of a household may not necessarily be a good guide to the household's vulnerability to being poor in the future (see Christiansen and Subbarao, 2005; Ligon and Schechter, 2003; Chaudhuri *et al.*, 2002).

Given the importance of risk and uncertainty; policy makers are beginning to incorporate risk and vulnerability into their strategies to reduce poverty and researcher has recently started

[1] In most cases defined simply by whether or not the households observed level of consumption expenditure is above or below pre-selected poverty line.

studying uncertainty as a determinant part of poverty itself (World Bank, 2001), referring to this new research interest as vulnerability to poverty. According to Christiansen and Subbarao (2005), understanding vulnerability in any human development strategy in conjunction with poverty is crucial, firstly, because vulnerability is an intrinsic aspect of well-being. In evaluating a household's well-being, one must not be limited to the household's actual welfare status today, but must also account for the household's prospects for being well in the future, and being well today does not imply being well tomorrow (McCulloch and Calandrino, 2003; Chaudhuri, 2001). Secondly, understanding vulnerability is also important from an instrumental perspective. Because of the many risks household face, they often experience shocks leading to a wide variability in their endowment and income (Christiansen and Subbarao, 2005). In the absence of effective coping strategies, households for example, may avoid taking risky but profitable opportunities or practice income smoothing as a substitute for consumption smoothing (Morduch, 1994). Others may be able to smooth their consumption by adopting ex-ante risk-mitigating strategies that while offering some stability often depletes their assets, such as distress sale of productive assets e.g. livestock (Rosenzweig and Wolpin, 1993), withdrawing their children from school when there are shortfall in income (Jacoby and Skoufias, 1997), or using assets as a buffer for consumption (Deaton, 1992). As a result of these risk management and coping strategies, households may appear to be more insured, when in fact their vulnerability to poverty is on the increase.

The foregoing suggests the need for a thorough understanding of the poor and vulnerable. Reliable vulnerability measure are needed for three important purposes *viz;* diagnostics, i.e. for tracking the vulnerability situation; for analytics, i.e. to understand the causes of vulnerability as

well as the effectiveness of the interventions aimed at alleviating vulnerability and for policy purpose, i.e. emergency, targeting, monitoring and evaluation. The need for vulnerability assessment according to Alayande and Alayande (2004) is underscored by some gaps that are left out in the study of poverty. For example, the issue of who is likely to be poor, what fraction of the population is at risk and why some households are more likely to be poorer than others. All these are within the purview of the dynamics of poverty, which cannot be captured by mere static poverty measurement. Therefore, with changing socio-economic status of households, due to changing circumstances, there is need to go beyond the static measures of poverty, hence the issue of vulnerability comes to the fore (Moser, 1998). Vulnerability to poverty which attempts to predict (ex-ante) an exposure to the probability of an adverse outcome has not been widely used alongside poverty in discussions of poverty reduction strategies even though the risk that household face are an important aspect of their wellbeing. This exposes a limited understanding of a household vulnerability to poverty. It is a common assertion that the poor are among the most vulnerable in any society (World Bank, 2001) but the overlap between poverty and vulnerability is not straight forward or perfect. It is generally agreed that while poverty is a static concept, defined at a single point in time, the concept of vulnerability is situated in a dynamic phenomenon and is less well defined. Since social protection strategies is moving from ex-post poverty strategies to ex-ante vulnerability considerations, making a clear distinction between poverty and vulnerability is important (Holzmann, 2001).

Analyzing poverty in a world of uncertainty, since future distributions of outcomes are unknown has therefore become essential. Incidentally, while studies e.g. Hoogeveen and Ozler (2006); Leibbbrandt and Woolard (1996, 2006); Leibbrandt *et al.,* (2005); Gyekye *et al.,* (2001); Charter

and May (1999); May *et al.*, (1995); Choonoo (1995); Whiteford and McGrath (1994); Simkins (1984), have employed both national level and provincial survey data to measure the incidence, intensity and severity of poverty in South Africa, quantitative studies on households' vulnerability to poverty are scarce. Ideally, the estimation of vulnerability at household level is done with a panel data, which is within a general framework and allows for inclusion of time-variant household effects and dynamic effect and in some cases to get a sense of the magnitude of biases in estimates of vulnerability generated from cross-sectional data. Following Ellis (2000) and Sen (2003), this study analyses a panel dataset on a representative sample of 150 rural households interviewed in 2007 and 2008 in the Amathole District Municipality of the Eastern Cape to empirical assess the dynamics of poverty as well as the determinants of vulnerability to poverty. This study attempt to contribute to an understanding of household vulnerability to poverty in South Africa since the identification of vulnerable households, together with an understanding of the sources of vulnerability is a pre-condition for successful anti-poverty policies. The main objective of this study is to examine the movement in and out of poverty and to estimate the determinants of households' vulnerability to poverty in the Amathole District Municipality.

The rest of the paper is organized as follows: Section 2 provides a brief review of the empirical literature on vulnerability. Section 3 outlines the details of the study data and research methodology, while study results are presented in section 4. Finally, section 5 concludes the study highlighting some policy implications for reducing households' vulnerability to poverty.

2 Vulnerability: A review of literature

There are many definitions of vulnerability and seemingly, no consensus on its definition and measurement (Chaudhuri, 2000). Christiansen and Subbarao (2005) define vulnerability as the ex-ante potential of a decline in future well being, or the ex-ante probability of falling below the poverty line at some future date. Along the same view, McCulloch and Calandrino (2003) defined vulnerability as the probability of being below the poverty line in any one year. Vulnerability according to Quisumbing (2002) is the likelihood that at a given time in future, an individual or household will have a level of welfare below a predetermined line within a fixed time interval, while Chaudhuri *et al.*, (2002), defined vulnerability within the framework of poverty eradication, as the ex-ante risk that a household will, if currently non-poor, fall below poverty line, or if currently poor will remain in poverty. Ligon and Schechter (2003) also define vulnerability as the uncertainty of future income streams an associated loss of welfare caused by this uncertainty. They noted that a household with very low expected consumption expenditures but with no chance of starving may well be poor but still might not wish to trade places with a household having a higher expected consumption risk. However it is not every time people are exposed to risk that they are vulnerable i.e. a shock might occur, but may not necessarily lead to households being vulnerable.

Vulnerability is multidimensional and households face a number of risk. The risk faced by an individual/household relates to events possibly occurring i.e. with less than certainty. Risk

affects many different aspects of people's livelihoods. It affects whether people can maintain assets and endowments, how these assets are transformed into incomes via activities and how these incomes and earnings are translated into broader development outcomes, such as health and nutrition. Households have a priori some sense of the likelihood of these events occurring, without direct control over this likelihood. The lack of direct control over the risk they face is crucial and distinguishes it from the responses one can expect from individuals, households and communities. According to Christiansen and Subbarao (2005) while the concept of risk refers to uncertain events that can damage the well-being of people such as falling ill, McCulloch and Calandrino (2003), see vulnerability as a function of the risk characterization of a person's environment – the nature, frequency, and severity of the shocks he is exposed to, his exposure to these risk, as well as his ability to cope with it when shock materializes which is determined by his endowments and his ability insure himself (formally or informally). Vulnerability is therefore the product of risk, but also of household conditions and actions (Dercon, 2001).

Therefore, vulnerability is defined here as the probability or risk today of being in poverty or to fall into deeper poverty in future. It is a key dimension of welfare since a risk of large changes in income may constrain households to lower investments in productive assets. High risk can also force households to diversify their income sources, perhaps at the cost of lower returns. Vulnerability may influence household behavior and coping strategies and is thus an important consideration for poverty reduction policies. The fear of bad weather conditions or the fear of being expelled from the land they cultivate can deter households from investing in more risky but higher productivity crops and affect their capacity to generate income.

According to Adesanoye and Okunmadewa, (2007), most researchers have seen poverty as a static rather than a dynamic phenomenon. However, studies have shown movements in and out of poverty of households in developing countries (Adams and He, 1995; Baulch and Hoddinott, 2000). Therefore, indicating that poverty is a dynamic phenomenon as people can fall into and move out poverty. According to Holzmann and Jorgensen (2001), in a dynamic environment where adverse economic shocks may be more easily transmitted across geographic borders, a social protection scheme might be able to perform more effectively the task of protecting households from the adverse effects of poverty by adopting a forward looking approach that not only identifies the groups of households that are presently poor but those that are vulnerable to economic shocks and other risks such as natural disasters and climate conditions. Whether households can effectively insure their consumption against shocks may be an important element determining their vulnerability to poverty, particularly if shocks have longer term effects.

According to Holzmann and Jorgensen (1999), a high percentage of households move into poverty due to temporary shocks (such as illness or loss of employment) that are reversed just one or two years later. Similarly, many of the people who escape poverty or who are not vulnerable now only succeed in doing so or being so for one or two years before a reverse in their circumstances pushes them back below poverty line which makes then vulnerable. The concept of vulnerability therefore, is dynamic and is broadly an ex-ante or forward looking measure of a household's well being or (lack thereof). The term has been used in a variety of related but different meanings. Chambers (1989) defined vulnerability as the exposure to

contingencies and stress which is defenseless, meaning a lack of means to cope without damaging loss. The World Development Report 2000/01, defined vulnerability as a likelihood that a shock will result in a decline in well-being. To date, no acceptable definition of, or measurement methodology for vulnerability to poverty has been agreed on. However, as demonstrated in Zhang and Wan (2006), most researchers prefer to define vulnerability as the probability of a household or individual falling into poverty in future, i.e. the danger that a socially unacceptable level of wellbeing may materialize in future. This definition is followed in this study.

3 Study Data and Analytical Technique

3.1 Study Data

A panel dataset were collected using structured questionnaires from a representative sample of 150 rural household heads in the Amathole District Municipality of the Eastern Cape Province. Data were collected from a two-round panel survey at one year interval to allow measurement of seasonal variation behaviour and outcome and to balance both the cross-sectional and time series requirements of panel data. The first round survey was carried out in 2007, with a re-survey of the same households in 2008. Data collected included demographic and socio-economic characteristics of the household heads as well as income and expenditure variables.

A multistage stratified random sampling technique (Barnett, 1991) was used to select representative households for the study. The first stage involved the selection of three local municipalities in the District Municipality, viz. Ngqushwa, Amahlathi and Nkonkobe. The

second stage involved random sampling of six villages within these local municipalities from which 25 respondents each were randomly selected. These villages were Peddie and Hamburg for Ngqushwa, Stutterheim and Keiskammahoek for Amahlathi, and Alice and Seymour for Nkonkobe. In the second survey round in 2008, purposive sampling was used in order to track the characteristics of the households at the two different periods.

3.2 Analytical Technique

3.2.1 Poverty Gap Index/Ratio

The analysis of poverty was based on the mathematical model developed by Foster, Greer and Thorbecke (1984), known as the FGT model of poverty decomposition. This was adopted to determine the incidence, depth and severity of poverty in the study area. The use of the FGT measures required the definition of a poverty line, which was calculated on the basis of aggregated data on household expenditure. The FGT measure, which is an approach to absolute poverty, is expressed as:

(1) $$P_{\alpha} = \frac{1}{n}\sum_{i=1}^{m}\left(\frac{z - y_i}{z}\right)^{\alpha}, \qquad \alpha \geq 0$$

Where;

$z =$ Poverty line

$m =$ Number of households below poverty line

$n =$ Number of households in the reference population/total sampled population

$y_i =$ Per adult equivalent expenditure of ith household in time period t

$\alpha =$ Poverty aversion parameter

$z - y_i =$ Poverty gap of the ith household in time period t

$$\frac{z - y_i}{z} = \text{Poverty gap ratio at time period } t$$

The headcount index is obtained by setting the $\alpha = 0$, $\alpha = 1$, the yield poverty gap index, and $\alpha = 2$, yield the squared poverty gap index.

3.2.2 Determination of Poverty Lines

The poverty line is the level of welfare that distinguishes poor households from non poor households. This is a pre-determined and well defined standard of income or value of consumption (expenditure). Poverty lines are often drawn either in relative or absolute terms. In the former, a proportion of the mean expenditure is taken as the poverty line, usually the one-third (which defines the core poverty line) and two-third (which defines the moderate poverty line) of mean expenditure have been commonly used. The absolute poverty line is a predetermined one based on some minimum food and non food expenditure below which a household is defined as poor if its consumption level is below this minimum. In other words, the poverty line is fixed in terms of the standard of living it commands over the domain of poverty measurement.

The choice of consumption based rather than an income based measure of household welfare is motivated by the fact that, income can be viewed as a measure of welfare opportunity or a measure of potential welfare whereas consumption on the other hand can be interpreted as a realized welfare or a measure of welfare achievement (Hentschel and Lanjouw, 1996; Atkinson, 1989). Since realised rather than potential welfare is the concerned, consumption is arguably a more appropriate indicator. This study follows the relative poverty line approach. Relative

poverty lines were constructed based on total household per capita consumption (expenditure) as the basic unit of household welfare; and the household's expenditure were corrected for household size and its demographic characteristics following Deaton and Muellbauer (1980) as follows;

(5) $$E = (A + \alpha K)^{\theta}$$

Where,

$E =$ Number of adult equivalents

$A =$ Number of adults

$K =$ Number of children

$\alpha =$ Fractional representation of children in adult equivalence i.e. child cost ratio

$\theta =$ Scale parameter

The adult equivalent conversion formulae of $E = (A + 0.5K)^{0.9}$ was adopted for the analysis, most poverty studies in South Africa have adopted the values of $\alpha = 0.5$ and $\theta = 0.9$ (May *et al.*, 1995).

The mean monthly per adult equivalent household expenditure (MPAEHE) of the sampled households was determined by dividing the total per adult equivalent expenditure for all households by the total number of households sampled. Hence, extremely (core) poor, moderately poor and non-poor household were identified. Those households who spend less than one-third (1/3) of MPAEHE were classified as extremely poor, less than two-third (2/3) of the MPAEHE as moderately poor, while non- poor are those who spend two-third or more of MPAEHE. Total per capita expenditure was used as a proxy for the standard of living of the

household in the study area. From the poverty lines, the poverty profile of different groups in the study area was analysed and measured through the FGT model. Households are grouped based on the measure of poverty as follows:

- The probability of being always poor defined as being poor in the two survey rounds.
- The probability of becoming poor defined as being non-poor in the first round but poor in the second survey.

A vulnerable household is therefore defined as a combination of those becoming poor and always poor i.e.

Vulnerable to poverty = (always poor + becoming poor)

Transitional Matrix Box

	Poor	Non-poor	Total
Poor	p_1	p_2	$p_1 + p_2$
Non- poor	P_3	p_4	$p_3 + p_4$
Total	$p_1 + p_3$	$p_2 + p_4$	Z

Where;

p_1 = Numbers of households that were poor in the two survey rounds.

p_2 = Numbers of households that were poor in the first round but non- poor in the second survey round.

p_3 = Numbers of households that were non- poor in the first round but poor in the second survey.

p_4 = Numbers of households that were non- poor in the two survey rounds.

Z = Total numbers of households i.e. ($p_1 + p_2 + p_3 + p_4$).

$$\textbf{Vulnerability index} = \frac{\text{Number of vulnerable household in the sub-group}}{\text{Total number of household in the subgroup}}$$

3.2.2 Model specification for vulnerability measurement

The probit model was used to ascertain the effect of the factors influencing household vulnerability to poverty. The probit model assume that while we observe the values of 0 and 1 for the variables W, there is a latent unobserved continuous variable W_i^* that determines the value of W, we assume that W_i^* can be specified as follows:

(1) $$W_i^* = \beta' X_i + \varepsilon_i > 0 \qquad \varepsilon_i \sim (0,1)$$

$$W = \begin{cases} 1 \\ 0 \end{cases}$$

Where; $W = 1$ if $W_i^* > 0$ and $W = 0$ if otherwise

The welfare indicator W_i^* is given as:

(2) $$W_i^* = \frac{Z - Y_i}{Z}$$

Where Z is the poverty line and Y_i is the consumption expenditure per adult equivalent. The vector of independent variables is denoted by X_i. β' is the vector of unknown coefficients and ε_i is an independently distributed error term.

(3) $$\Pr(W_i = 1) = (\beta_0 + \beta' X_i + \varepsilon_i > 0)$$

Rearranging the terms

$$\Pr(W_i = 1) = \Pr\left[\varepsilon_i > -(\beta_0 + \beta' X_i + \mu_i)\right]$$

$$= 1 - \Pr\left[\varepsilon_i < -(\beta' X_i + \mu_i)\right]$$

If we make the usual assumption that the error term is normally distributed, we have;

(4) $$\Pr(W_i = 1) = 1 - \Phi\left[-(\beta' X_i)\right]$$

$$= 1 - \Phi\left[(-\beta' X_i)\right]$$

$$= \Phi\left[(\beta' X_i)\right]$$

Where $\Phi =$ Standard cumulative normal distribution; $X_i =$ Vectors of independent variables and $\beta' =$ Estimates of coefficients which give the impact of the independent variables on the latent variable W_i^*

The model can be stated in its explicit form as:

(5) $$W = f(X_1, X_2, X_3, X_4, ...X_n)$$

The dependent variable (W) in the Probit model is dichotomous (=1 if household is vulnerable, i.e. always poor + becoming poor and 0 if the household is not vulnerable). The explanatory variables $(X_1, X_2, X_3, X_4, ...X_n)$ used to explain this vulnerability status are presented in Table 1. Because they are the outcome of *ex-ante* expectations, no unambiguous predictions on the signs of these variables effects on vulnerability can be made. The education level and marital status of the household head are all expected to a have negative influence on a household being vulnerable to poverty. Households' head access to land, credit and a higher degree of social

capital could also reduce the probability of a household being vulnerable to poverty. A higher degree of exposure to covariate and idiosyncratic risks, old age, and a high dependency ratio are likely to increase a households' vulnerability to poverty. Household heads' gender and occupation has an indeterminate sign *a priori.*

Table 1: Explanatory variables used in the Probit model

Variables	**Measurement and units**	**Expected effect on vulnerability**
Gender	Male = 1; Female = 0	+/-
Age	Age of Household head (in years)	+
Education	Years of school attendance (in years)	-
Marital status	D=1 if married; 0 if otherwise	-
Occupation of household head	D=1 if farming; 0 if otherwise	+/-
Dependency ratio	The number of dependants (aged 0-14 and over the age of 65) to the total household size, expressed as a percentage.	+
Household head access to credit	D=1 if with credit access; 0 if otherwise	-
Access to land	Household access to land use Yes = 1; No = 0	-
Social capital	Number of associations belonged to	-
Exposure to covariate risks of household head	D=1 if exposed; 0 if otherwise	+
Exposure to idiosyncratic shock of household head	D=1 if exposed; 0 if otherwise	+

Empirical results of the movement in and out of poverty and the estimates of Probit model are presented in the next section.

4 Empirical Results

4.1 Movement in and out of poverty in the Amathole District Municipality.

Different poverty line was computed for the two survey rounds in 2007 and 2008. This is based on a relative poverty line, the Mean per Adult Equivalent Household Expenditure (MPAEHE) for the respondents was estimated at R330,84, while the two-thirds MPAEHE was estimated to be R220,56 in 2007. Similarly, in 2008, the MPAEHE was estimated at R287,93, while the two-thirds MPAEHE was R198,62. Therefore any household that had MPAEHE below or equal to R220,56 or R198,62 was considered to be poor in 2007 and 2008 respectively while a household with MPAEHE above these amounts is considered non-poor during these periods. When two observations in time are available, transition matrices can be used to map changes in (improvement or decline) in household welfare. Table 2 presents a transition matrix depicting the movements in and out of poverty, while Table 3 presents the incidence of poverty and vulnerability by socio-economic characteristics of the sampled households in the Amathole District Municipality of the Eastern Cape Province between 2007 and 2008.

Table 2: Movement In and Out of Poverty in the Amathole District Municipality, Eastern Cape Province. (n=150)

Poverty status in 2007	Poverty status in 2008		
	Poor	**Non-poor**	**Total**
Poor	**44↔**	**22↑**	**66**

Non-poor	**50↓**	**34↔**	**84**
Total	**94**	**56**	**150**

Source: Calculated from field survey data 2007 and 2008.

Table 3: Poverty incidence and vulnerability by socio-economic characteristics

Socio-economic characteristics	**(n)**	**Poverty incidence**		**Vulnerability Index**
		Oct. 2007	**Oct. 2008**	
Gender of household head				
Male	54	0.41	0.66	0.38
Female	96	0.46	0.50	0.62
Marital status				
Single	56	0.42	0.96	0.96
Married	94	0.36	0.36	0.43
Age				
25-39	61	0.62	0.32	0.32
40-59	75	0.24	0.66	0.66
60-69	14	0.71	1.00	1.00
Education				
(Illiterate) 0	29	1.00	1.00	1.00
Primary (1-5 yrs schooling)	34	0.73	0.79	0.70
Middle (6-9 yrs schooling)	57	0.21	0.45	0.68
Matric and above (10+ yrs schooling)	30	0.00	0.07	0.07
Occupation				
Farming households	134	0.48	0.58	0.67
Others	16	0.12	0.31	0.25
Dependency ratio				
0-100%	125	0.33	0.67	0.67
Above 100%	25	1.00	1.00	0.40
Credit constraint status				
Yes	122	0.54	0.68	0.77
No	28	0.00	0.00	0.00

Land ownership				
No	140	0.60	0.60	0.67
Yes	10	1.00	0.00	0.00
Social Capital				
0	27	1.00	1.00	1.00
1-2	95	0.38	0.53	0.60
Above 2	28	0.11	0.21	0.55

Source: Calculated from field survey data 2007 and 2008.

The incidence of poverty was higher both in the second round of the survey as shown in Table 2. The headcount index of poverty has increase from 0,44 in 2007 to 0,56 in 2008. Although the headcount index of poverty in 2008 was 0,56 the vulnerability index was 0.62, implying that 62 percent of the sampled households are vulnerable to poverty. More than half of the households that were poor in 2007 remained poor in 2008 (44 out of 66), the remaining 22 households that were poor in 2007 had emerged from poverty by 2008. However, more than half of the non-poor households in 2007 had fallen in poverty by 2008 (50 out of 84). This result suggests a significant flow in and out of poverty, which is a sign of vulnerability.

Female households are poorer compared to male headed households in 2007 and while in 2008, the reverse was the case. This implies that both male and female headed households could indeed be poor depending on their exposure to risks. However, the vulnerability index suggests that female headed households are more vulnerable to poverty compared to the male headed households. The incidence of poverty was also highest among single (unmarried) households

compared to the married households in both survey rounds. Vulnerability index however shows that single (unmarried) households are more vulnerable to poverty. In the first and second survey rounds, there is higher incidence of poverty among household heads aged 60 years and above. In support of this, household becomes more vulnerable to poverty with an increase in the age of household head. Vulnerability index was highest for household heads aged 60 years and above as compared to those aged between 40-59 years and those aged between 25 -39 (these are the least vulnerable group).

All household heads with no formal education remain poor in both survey rounds. The vulnerability index for this group was the highest, while those with more than 10 years of schooling have lower incidence of poverty in both survey rounds and are less vulnerable to becoming poor. However, the incidence of poverty among farming households is on the increase, and are more vulnerable to poverty compared to those in the other sector of the economy. Expectedly, households with high dependency ratio have the highest incidence of poverty in both survey rounds and are more vulnerable to becoming poor. This may be due to the fact that a household with many dependents tends to exert more pressure on household resources. The incidence of poverty was also high among households that have constrained access to credit in both survey round, and they are therefore more vulnerable to becoming poverty. Households that have access to land have low incidences of poverty in both survey rounds compared those without access to land and are less vulnerable to becoming poor. Also households that are members of association/clubs or societies have less incidence of poverty and are less vulnerable to becoming poor compared to those who are not members of any association.

4.2 Estimate of the determinants of household vulnerability to poverty

The probit model was used to estimate the determinants of household vulnerability to poverty. The estimate of the result of the probit analysis is presented in Table 4. There is no household exposed to covariate risks (community shocks e.g. natural disasters, floods, earthquakes epidemics etc). This variable was therefore dropped from the analysis.

Table 4: Estimated coefficients for the Probit model of a household vulnerability to poverty. Amathole District Municipality, Eastern Cape Province, 2008 (n = 150)

Variables	Estimated Coefficients	Standard Errors	z- statistics	$P[\lvert Z\rvert > z]$
Constant	-2.7978***	0.6475	-4.3200	0.0000
Gender	0.2794	0.2796	1.0000	0.3180
Age	0.0323**	0.0139	2.3237	0.0364
Education	-0.1249*	0.0692	-1.8049	0.0642
Marital status	-0.1313	0.1573	-0.8347	0.4040
Access to land	0.0855	0.2878	0.2971	0.7660
Occupation	0.2156***	0.0710	3.0370	0.0032
Dependency ratio	0.1367***	0.0384	3.6056	0.0081
Access to credit	-0.0332***	0.0080	-4.1482	0.0072
Social capital	0.1568	0.5040	0.3111	0.7560
Exposure to idiosyncratic risks	0.0015**	0.0006	2.5000	0.0170

LR Chi2 (10) = 30.46 ***Pseudo R2 = 0.2109***
Prob > Chi2 = 0.0001 ***Log likelihood = -56. 9743***

Note: ***, **, and * denote statistical significance at the 1, 5 and 10% levels, respectively.
Source: Probit regression estimation using the software STATA 10.

The result of the probit analysis shows the coefficient of the age of household head is statistically significantly positively related to household's vulnerability to poverty, implying that the likelihood of a households' becoming vulnerable to poverty increases with an increase in the age of the household head. This could be due to the fact many elder people have to fend for themselves and in most cases do not have others on whom to rely for support. Although many receive old-age grant but as demonstrated by Robert (2001), these grants are in no way sufficient to keep a household out of poverty. Thus, the degree to which a poor elderly person manages to escape poverty, would generally depend on changes in his household circumstances, for instance if a child secure a good job, a decline dependency ratios accompanied by some relief of financial burdens or if his assets tends to increase with age.

The coefficient of household education as measured by years of schooling is statistically significantly negatively related to vulnerability to poverty. This implies that household becomes less vulnerable to poverty with an increasing educational attainment, i.e. the higher the years of schooling the lowers the odds that a household head will be vulnerable to poverty. This conforms to other studies concluding that education attainment decreases poverty (e.g. World Bank, 2002). With an increase in educational attainment, a household head could secure a job and take opportunities which would otherwise not be possible and he is better poised to cope with risk and uncertainty and therefore less vulnerable to poverty. Education is expected to lead to increased earning potential and improve occupational and geographical mobility of labour. Higher levels of educational attainment will provide higher levels of welfare for the household.

The coefficient of household primary occupation is statistically significantly positively related to household's vulnerability to poverty. This implies that a farming household is more likely to be vulnerable to poverty compared to those in other sectors of the economy. The vast majority of the households are stuck in rural areas and are engaged in farming but do not own land and other resources to progress as farmers. These would lead one to expect that agriculture in these rural areas is unlikely to provide any notable welfare benefits (Aliber, 2003). The estimated coefficient of households' dependency ratio is statistically significantly positively related to it's vulnerability to poverty, implying that the larger the dependency ratio, the more the likelihood of a household becoming vulnerable to poverty. This could be as a result of much pressure exerted on the limited resources at the household level.

The coefficient of household exposure to idiosyncratic risk is statistically significantly positively related to household's vulnerability to poverty. This implies that households exposed to household level shock such as illness, job loss, death, injury/disability, unemployment, crop pest and diseases are vulnerable to becoming poor. This is because these unanticipated events will erode the households' economic base and deplete its resources/assets.

The coefficient of credit availability is statistically significantly negatively related to vulnerability to poverty. This implies that households with access to credit are less likely to be vulnerable to poverty. As increased access to credit market enhances household welfare through the provision of investment credit to boost household income (Adugna and Heidhues, 2000) as well as smooth consumption (Zeller, *et al,* 1994), which could significantly influence a

household's income by helping its members to tap economic opportunities, thereby assisting them to get out of poverty (Binswinger and Khandker, 1995; Adugna and Heidhues, 2000).

5 Conclusions and Policy Implications

This study analyses a panel dataset on a representative sample of 150 rural households interviewed in 2007 and 2008 in the Amathole District Municipality of the Eastern Cape Province to empirical assess the dynamics of poverty as well as the determinants of vulnerability to poverty. The result of the study indicates that the number of vulnerable households is significantly larger than for the currently poor households; the vulnerability index was found to be 0,62 compared to 0,56 headcount index in 2008. This implies that while 56 percent of the sampled households are poor (*ex post*) in 2008, 62 percent are vulnerable to becoming poor (*ex ante*) in future. A large number of households that are now non-poor are certainly vulnerable to descending into poverty in future. This has a policy implication and it is imperative for policy makers to note this when designing social policy. *Ex ante* strategies should be developed to prevent households from becoming poor as well as *ex-post* strategies to alleviate poverty for those already sunk in poverty.

The result of the Probit model shows that the age, level of education and occupation of the household head, dependency ratio and access to credit are statistically significant in explaining a households' vulnerability to poverty. Education is found to be an important element in reducing vulnerability. Households headed by illiterate person are more vulnerable to poverty, whereas a household head with a higher level of education is better poised to cope with risk and uncertainty

and therefore less vulnerable to poverty. Therefore, investment in human capital along with other means of social protection/promotion (such as old age grants, especially for the elderly who are the most vulnerable) could be instrumental for reducing household vulnerability to poverty. Farming households again are found to be more vulnerable than non-farming households. This underscores the need for more protection for the farming community.

As will be noted, anti-poverty and anti- vulnerability strategies are similar. The only difference is that vulnerability puts ahead the importance of social protection and promotion programmes for ensuring inclusiveness in the development process so that growth becomes more pro-poor. It is also important for policy makers to note the varying nature of poverty and vulnerability in designing policies. For instance, the chronic poor who lack productive and economic assets, priority should be given to reduction of consumption fluctuations and building up of assets through the combination of protective and promotional programmes. For example, access to micro-credit might help them build up assets as it smoothes income and consumption, enhances the purchases of inputs and productive assets as well as provide protection against risks. Furthermore, the non-poor but vulnerable household are most likely to benefit from some combination of prevention, protection and promotion which would give them a more secure base to diversify their production activity into higher-return and higher risk activities.

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