Possible causes of poverty within a group of land reform beneficiaries in the midlands of KwaZulu-Natal: Analysis and policy recommendations

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Abstract

This study investigates possible causes of poverty afflicting a community of land reform beneficiaries in the Midlands of KwaZulu-Natal. The 38 beneficiary households had previously been clustered into four groups displaying different symptoms of poverty. Linear Discriminant Analysis was used first to distinguish households that were relatively income <u>and</u> asset "rich" from those that were relatively income <u>and</u> asset "poor", and second to distinguish households that were relatively income poor but "asset rich" from those relatively asset poor but "income rich". In the first analysis it was found that "rich" households could be distinguished from "poor" households using just two indicator variables; gender of the household head and family size. Larger, female-headed households have lower income and wealth per adult equivalent. In the second analysis, it was found that the "asset rich" had more human capital whereas the "income rich" owned vehicles and had fewer dependants per worker. Policy recommendations therefore point to education and vocational training – especially for women, better access to transport, jobs and banking facilities (to mobilise savings) in the long run, and improved and better targeting of social welfare grants for the chronically poor in the short run. These interventions are also expected to increase the demand for family planning and contraception, which in turn helps to reduce family sizes and the premature loss of breadwinners.

1.   Introduction

The ultimate objective of development is to improve the quality of life of people. Developing countries need to identify and implement poverty reducing strategies and to assess the extent and depth of poverty before and after any such strategy (Booker *et al*, 1980:19). It is therefore important to distinguish between the causes and symptoms of poverty, as it is the treatment of root causes rather than the symptoms that will address poverty in the long run. Treatment of the

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symptoms is however necessary to improve living conditions in the short-run, and because today's symptoms often contribute to future poverty.

This study investigates relationships between long-term causes of poverty (such as low levels of human capital) and their symptoms (such as low levels of income and economic wealth) observed in a community of 38 households that benefited from Settlement/Land Acquisition Grants (SLAG) awarded by the Department of Land Affairs (DLA). The beneficiaries pooled their grants and established a Communal Property Association to purchase a 630 hectare grazing farm in the Midlands of KwaZulu-Natal. This paper builds on an earlier study of the beneficiary community conducted by Shinns and Lyne (2003) who demonstrated the effects of alternative welfare programmes on households displaying different symptoms of poverty. Apart from informing policy recommendations aimed at alleviating rural poverty in South Africa, these studies will provide baseline information needed to monitor changes in the level and distribution of poverty within the beneficiary community over time.

The paper begins with discussion of the main causes and symptoms of poverty. Section 3 describes the data gathered, and postulates a discriminant model to explore relationships between possible causes of poverty and membership of the poverty groups identified by Shinns and Lyne (2003). Section 4 presents the results of the discriminant analysis, and section 5 examines their policy implications. Conclusions are drawn in the final section.

2.   Symptoms and causes of poverty

The concept of economic poverty has been briefly defined as the inability to attain goods and services considered essential to human well being. Although poverty is a global phenomenon, the situation in South Africa is fairly unique in that colonialism and apartheid shaped the present poverty and opportunity configurations along racial lines. Disadvantaged groups in rural South Africa have been left with fewer resources, including land, lower levels of education, and spatially divided households due to the need for external incomes (Aliber, 2001:6). Shinns and Lyne (2003) summarise the main symptoms of poverty as:

- Low levels of income. Woolard (2002:1) reports that eight million of the 42 million people living in South Africa were surviving on less than $1 per day, and 18 million were living on less than $2 per day, in 2002.

- Low levels of economic wealth. Economic wealth derives from assets that can generate income, capital gains or liquidity when strapped for cash. Assets like oxen play an insurance role in the event of adverse

shocks (such as drought or the loss of a wage worker or pensioner) helping to smooth consumption in areas where households do not have access to efficient insurance and credit markets (Little, 2002). Studies in rural Ethiopia show that after the debilitating effects of drought, households deplete their livestock herds and consume their seed stocks (asset de-accumulation) to postpone malnutrition and disease (Little, 2001).

- Low levels of health. High levels of morbidity and infant mortality are often the result of poor nutrition and inadequate health care. In South Africa, AIDS has compounded these problems. It is projected that the AIDS death toll will top 5.5 million by 2011 (Development Resources Centre, 2001). In 2001, South Africa's infant mortality rate was more than ten times higher than the rate in high-income countries, and average life expectancy had fallen to 47 from 61 years in 1998 (South African Data Profile, 2002).

- Poor standards of housing. Inadequate housing in urban townships and rural settlements has reached crisis proportions in South Africa, with some seven million people estimated to be living as squatters (Brew, 2002: 1). However, it is not only the type of dwelling (formal versus informal) that is important, but also the density of occupation, what the dwelling is constructed of, and whether or not sanitation is hygienic and water is safe to drink (May *et al*, 1995: 24). In 1999, only 47% of the poor in South Africa had access to reticulated water and 38% to adequate sanitation. (Woolard, 2002:3).

The main causes of poverty appear to be associated with:

- Location. This problem manifests in poor natural resources and high transaction costs in remote areas where physical infrastructure and services are inadequate (White & Killick, 2001).

- Proneness to income shocks. Income shocks are more frequent and severe where people have poor access to health care and rely on agriculture for livelihoods (White & Killick, 2001). Farming is particularly vulnerable to natural disasters such as drought, floods, pests and disease.

- Institutional failures. Insecure property rights and weak regulatory and enforcement systems raise transaction costs and reduce both the incentive and ability to use assets properly (White & Killick, 2001).

- Gender discrimination. Unskilled women usually earn lower incomes than do unskilled men who have greater physical strength for manual

work (White & Killick, 2001), and often face higher transaction costs in credit and other markets due to their lower social standing (Berry, 1993). This leads to lower earning capacities for households with a high proportion of females, and reduced opportunities for female-headed households. Gender discrimination is also evident in education. A recent study of 41 countries shows that parents who cannot afford to enrol all of their children for school tend to enrol males ahead of females (World Development Report 2001:27).

- Human capital. Unemployment levels are highest amongst people who lack education (Woolard, 2002:3). In South Africa almost 60 per cent of adults with no formal education are poor, whereas the incidence of poor people is 15 per cent amongst matriculants and just five per cent amongst those with tertiary education (Woolard, 2002:4).

- Social capital. This incorporates concepts such as "trust", "community" and "networks" that indicate faith in safety nets provided by family, community and government. Social capital is sometimes approximated by measures of trust in government, voting trends, participation in civic organisations, donations and voluntary work. In a large-scale survey of social capital in Tanzania, Narayan and Pritchett (1997) found that village-level social capital raised household incomes.

Of course, the distinction between causes and symptoms of poverty is seldom clear-cut. For example, low levels of income today may cause low levels of education tomorrow (White & Killick, 2001:28). Treating the symptoms of poverty may therefore go beyond short-run improvements in living conditions. In addition, it is not possible to observe all of the potential causes of poverty in a small cross-sectional study such as this one.

3. Empirical analysis

3.1 The study population

In 1999, farm workers and their families living on the farm Sherwood in the Midlands of KwaZulu-Natal applied to the DLA for "Labour Tenant" status and Settlement/Land Acquisition Grants (SLAG) of R15, 000 per beneficiary household to purchase a 630 hectare subdivision of Sherwood. A conditional agreement of sale was negotiated between the owners of Sherwood and the beneficiary households represented by the eGamalethu CPA. Thirty-eight beneficiary households relocated to the "new" farm while waiting for the DLA to award their grants and complete the land transaction. These moves were

premature in the sense that the farm was occupied without the benefit of a land use plan or essential services. The transaction was completed in May 2002, at which time the DLA had not still not appointed Planners to develop a land use plan, or to establish what services and infrastructure the beneficiaries should finance with the unspent balance of their grants (Shinns & Lyne, 2003).

3.2   Data collection

Data used in this study were gathered in a census survey of the 38 beneficiary households residing on the "new" farm in May 2002 (Shinns & Lyne, 2003). A structured questionnaire was completed for each household with questions answered by the household head. A household was defined as a group of people who live and take meals together, including daily commuters, but excluding weekly commuters and migrants. Income remitted by weekly commuters and migrants is nevertheless treated as a source of household income. The data were captured in electronic worksheets using Microsoft Excel© and checked for errors by examining descriptive statistics computed using SPSS V.11 (Norusis, 1994).

3.3   Symptoms and possible causes of poverty

The questionnaire elicited information about variables representing the symptoms and possible causes of poverty. Table 1 summarises descriptive statistics computed by Shinns and Lyne (2003) for variables representing the symptoms of poverty. The variables *walls*, *water* and *sanitation* were collapsed into a single index of housing quality using Principal Components Analysis. Shinns and Lyne (2003) then used Cluster Analysis to classify beneficiary households with similar poverty symptoms into five different groups. In this way, the data and not the researchers defined groups of households with different symptoms and relative levels of poverty (see section 3.4).

Table 1:   Household descriptive statistics for symptoms of poverty, n=38

Poverty symptoms	Variables	Definition	Mean
Housing	*Walls*	Brick, block or stone =1, 0 otherwise	7.89%
	Water	Protected water source = 1, 0 otherwise	5.26%
	Sanitation	Adequate = 1, 0 otherwise	63.2%
Income	*Income*	Monthly cash income (Rands/A.E.)	R219.92
Health	*Morbidity*	Household members sick during the last two months/A.E.	0.133
Wealth	*Livestock*	Value of livestock (Rands/A.E.)	R2570.90

Note: A.E. = Adult Equivalents = $(adults + (0.5) children)^{0.9}$.
Source: Shinns and Lyne (2003).

Variables representing the possible causes of poverty observed in the cross-sectional survey are listed in Table 2. Note that there is no variation in the mean values computed for distances to services because the beneficiary households reside in close proximity to one another.

Table 2:   **Household descriptive statistics for possible causes of poverty, n=38**

Poverty cause	Variables	Definition	Mean	Standard error
Human and social capital	Junior	Number of adults with schooling below grade 7 per adult	1.790	0.197
	Senior	Number of adults with schooling between grades 7 and 10 per adult	0.684	0.161
	Matric	Number of adults with grade 12 per adult	0.068	0.021
	English	Number of adults who can speak English	1.211	0.224
	Support	Has borrowed money from relatives = 1, 0 otherwise	0.053	0.037
Location	Transport	Number of vehicles owned	0.105	0.051
	Road	Kilometres to district road	9	0
	Taxi	Kilometres to taxi service	9	0
	Telephone	Kilometres to telephone	2	0
	Bank	Kilometres to bank	30	0
	Post Office	Kilometres to Post Office	2	0
Gender and household characteristics	Female Head	Head of household is female =1, 0 otherwise	0.368	0.079
	Femininity Ratio	Number of female adults per male adult	0.554	0.039
	Pensioner Ratio	Number of pensioners per adult	0.086	0.030
	Dependency Ratio	Number of infants, scholars, disabled and unemployed household members per wage earner	1.892	0.304
	Adult Equivalents	(Adults + (0.5) children)$^{0.9}$	4.428	0.332

3.4   Empirical model

A linear discriminant model was postulated to isolate and rank causes of poverty associated with groups of households displaying different symptoms of poverty. Linear Discriminant Analysis (LDA) is a technique to statistically distinguish between two or more groups using a set of discriminating (explanatory) variables. The objective of LDA is to form weighted linear combinations of explanatory variables that are selected to force the groups to be as statistically distinct as possible (Klecka, 1975:435). Discriminant Analysis assumes that the discriminant function scores (D_i) are normally distributed for each group and that the groups have equal variance-covariance matrices for

the discriminating variables. In practice these conditions are seldom applied strictly as the technique is very robust (Klecka, 1975:436). In this study the discriminant analysis is intended to identify associations (rather than explicit causal relationships) between possible causes of poverty and groups of households displaying different symptoms of poverty. Table 3 summarises the symptoms of poverty that characterise the five clusters of beneficiary households identified by Shinns and Lyne (2003).

Table 3:   Cluster means for symptoms of poverty, n=38

Cluster	Number of households	Poverty symptoms			
		Monthly income (Rands/A.E.)	Wealth (livestock/A.E. in Rands)	Health (household members sick/A.E.)	Housing index
1	7	329	3361	0	-0.487
2	11	117	4502	0.075	0.184
3	11	368	911	0.094	-0.516
4	4	111	1899	0.091	2.062
5	5	78	1404	0.563	-0.237
Overall mean		220	2571	0.133	0

Source: Shinns and Lyne (2003).

Households in cluster 1 are relatively income and asset rich. Those in cluster 2 are asset rich but income poor. To some extent, they are able to cope with adverse shocks by liquidating cattle, the single most important store of wealth for these households. Households in cluster 3 lack this liquid store of wealth and are therefore vulnerable to disruptions in their relatively high-income stream. Those in cluster 4 are both income and asset poor. However, they have the best standard of housing and relatively good health, suggesting that these households may have only recently slipped into cluster 4 following an adverse shock such as the death of a pensioner or wage earner. Households in cluster 5 are chronically poor in terms of cash, livestock and housing, and suffer a high incidence of morbidity – most probably a result of poor nutrition, shelter and clothing.

Owing to the small sample size, Discriminant Analysis was applied only to pairs of groups: The first analysis distinguished between the "rich" (cluster 1) and "poor" (cluster 4 plus the five cases in cluster 5), while the second analysis examined the more subtle differences between the "asset rich"(cluster 2) and "income rich" (cluster 3). The following linear discriminant model was postulated to predict group membership in both instances:

D_i = f (Matric, Support, Transport, Female Head, Femininity Ratio, Pensioner Ratio, Dependency Ratio, Adult Equivalents)

Several of the possible causes of poverty listed in Table 2 were omitted from this model because they lacked variation or measured the same concept as one of the variables included in the model (for example, the variables English, Junior and Senior were highly correlated with Matric). Following the arguments presented in Section 2, the signs of the coefficients estimated for the discriminating variables in the first model ("rich" vs. "poor" households) were expected to be positive for the variables Matric, Support and Transport, and negative for the variables Female Head, Femininity Ratio and Dependency Ratio. Ordinarily, pensioners would earn less than other adults, and households with high a Pensioner Ratio would be predictably poor, *ceteris paribus*. However, at Sherwood where most adults are unskilled and unemployment rates are very high, pensioners are viewed as income generators (rather than as dependants) and a large Pensioner Ratio is more likely to indicate "rich" households. Family size (Adult Equivalents) was included in the model as a control variable for the ratios.

The expected signs of the coefficients estimated for the discriminating variables in the second model ("asset rich" vs. "income rich") are more difficult to rationalise. Households that had accumulated higher levels of liquid assets (livestock) were considered to have benefited from higher incomes in the past, whereas those with relatively high current incomes but low livestock wealth had not. The variables Matric and Support were expected to bear positively on livestock wealth, as these attributes would not have changed much over time. Conversely, Transport was expected to bear more positively on current income. Households with serviceable vehicles have better access to job markets, but current ownership does not imply past ownership and the vehicle may be a substitute for investment in cattle. The Pensioner Ratio was also expected to bear more positively on current earnings than on accumulated assets because observed pensions were paid by the state and not by the private sector. This suggests that pensioners were not high income earners before they retired. Households with Female Heads and with higher Femininity and Dependency Ratios are likely to have had higher incomes in the past (before losing adult male workers) and these variables were therefore expected to bear more negatively on current income than asset levels. Again, family size (Adult Equivalents) was included in the model as a control variable for the ratios.

Univariate F-tests were used to check for significant differences between group means computed for each of the postulated discriminating variables and only those variables with F-values greater than or equal to unity (boldface in Table 4) were retained for analysis.
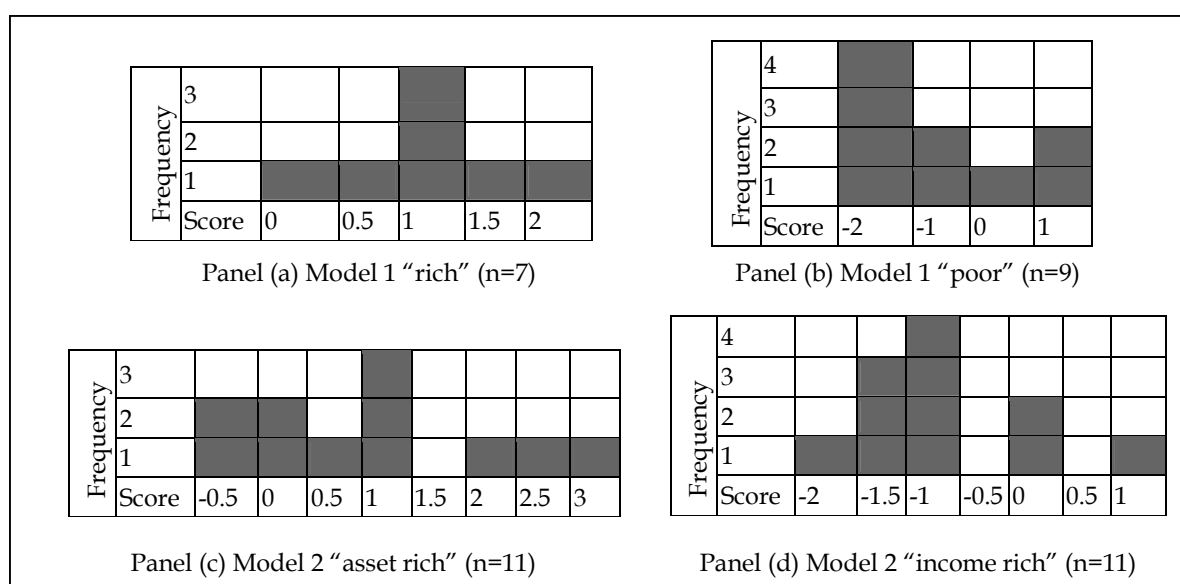
Table 4:   Group means for postulated discriminating variables

Discriminating variables	Model 1			Model 2		
	"Poor" (n=9)	"Rich" (n=7)	F-value	"Asset rich" (n=11)	"Income rich" (n=11)	F-value
Matric	0.049	0.036	0.066	**0.138**	**0.034**	**3.145***
Support	0.000	0.000	N/A	**0.091**	**0.000**	**1.000**
Transport	0.222	0.143	0.144	**0.000**	**0.091**	**1.000**
Female Head	**0.556**	**0.143**	**3.049***	0.364	0.364	0.000
Femininity Ratio	0.517	0.610	0.749	0.503	0.600	0.726
Pensioner Ratio	0.091	0.179	0.457	**0.028**	**0.083**	**1.639**
Dependency Ratio	**2.558**	**1.262**	**1.402**	2.456	1.185	3.696*
Adult Equivalents	**5.217**	**3.224**	**3.650***	4.919	4.058	1.081

Note: * Denotes statistical significance at the 10% level of probability.

4.   RESULTS

Table 5 presents the results of the discriminant function analyses. Model 1 accounted for 16 of the 38 cases and Model 2 for the remaining 22 cases. Both models are statistically significant and both have good predictive ability with rates of correct classification ranging from 78 per cent for the "rich" group up to 91 per cent for the "income rich" group. Box's M-test did not detect significant differences between group variance-covariance matrices for either model, and the distribution of predicted discriminant function scores is approximately normal in all of the groups except the "poor" group where the distribution is negatively skewed (Figure 1).

Panel (a) Model 1 "rich" (n=7)

Panel (b) Model 1 "poor" (n=9)

Panel (c) Model 2 "asset rich" (n=11)

Panel (d) Model 2 "income rich" (n=11)

Figure 1:   Distribution of predicted discriminant scores by group

The discriminating variables were fitted using a stepwise procedure (SPSS v11.5, 2002), rejecting variables that were not statistically significant at the ten per cent level of probability. Multicollinearity was not considered to be a problem as the lowest tolerance value for excluded variables was 0.81 in Model 1 and 0.54 in Model 2. Signs of the estimated coefficients are consistent with *a priori* expectations.

Two of the three discriminating variables analysed in Model 1 were retained. Their standardised coefficients are both significant at the five per cent level of probability, of similar magnitude, and carry negative signs (Table 5). When related to the group centroids (positive for "rich" and negative for "poor"), it can be concluded that sample households with the lowest income and wealth per adult equivalent tend to be female-headed and relatively large, and that these two variables are equally important determinants of the poorest households.

In Model 2, three of the six discriminating variables analysed were retained. The standardised coefficients estimated for Matric and Dependency ratio were positive, of similar magnitude and statistically significant at the one per cent level of probability. The third variable, Transport, has a smaller absolute coefficient and carries a negative sign. When related to the group centroids (positive for "asset rich" and negative for "income rich"), it can be concluded that sample households possessing more livestock (a liquid store of wealth) tend to have more educated adults whereas those with less livestock but higher current incomes tend to own serviceable vehicles and have fewer dependants per worker.

Table 5:   Estimated discriminant functions

Discriminating variable	Model 1 ("rich vs "poor")		Model 2 ("asset rich vs "income rich")	
	Standardised coefficients		Standardised coefficients	
Matric			1.048***	
Transport			-0.641*	
Female head	-0.901**			
Pensioner ratio				
Dependency ratio			0.917***	
Adult equivalents	-0.936**			
Group	**"rich" (n=9)**	**"poor" (n=7)**	**"asset rich" (n=11)**	**"income rich" (n=11)**
Centroid	0.95	-0.74	0.91	-0.91
Correct Classification (%)	77.8%	85.7%	81.8%	90.9%
Overall Correct Classification (%)	81.3%		86.4%	
Wilk's Lambda	0.553**		0.524***	

Note: ***, ** and * denote statistical significance at the 1%, 5% and 10% levels of probability respectively.

5.   Conclusions

This study attempts to identify the fundamental causes of poverty by explaining differences between groups of sample households with different poverty profiles. In the extreme case, where the objective was to distinguish sample households that had relatively high income <u>and</u> wealth from those with the least income <u>and</u> wealth, it was found that a distinction could be drawn using just two indicator variables; gender of the household head and family size. Larger, female-headed households have lower income and wealth per adult equivalent. In the second case, where the objective was to distinguish between sample households that had more wealth from those with less wealth but higher levels of current income, it was found that the "asset rich" had more human capital whereas the "income rich" owned vehicles and had fewer dependants per worker.

An obvious weakness of the study is that important causes of poverty relating to location, income shocks and institutional failures could not be investigated because the data were gathered at a single point in time from respondents living at the same location under the same institutional arrangements. Nevertheless, the results do shed some light on the dynamics of poverty and appropriate policy interventions. Poverty may be triggered by the loss of a male breadwinner. Household income falls immediately, especially if there are many dependants per remaining worker. Over time, this leads to asset de-accumulation if there are no, or few, other educated workers in the household. Some of these households become very dependent on social welfare grants for survival. In this rural sample, almost 30 per cent of households fall into this vulnerable category where current incomes are relatively high but wealth is depleted. Vulnerable households that do not qualify for social welfare (say, following the death of a pensioner) may well slip into chronic poverty. Almost 25 per cent of the sample households (mostly large, female-headed families) belong to this income <u>and</u> asset poor group.

Policy recommendations therefore point to education and vocational training – especially for women, better access to transport, jobs and banking facilities (to mobilise savings) in the long run, and improved and better targeting of social welfare grants for the chronically poor in the short run. These interventions are also expected to increase the demand for family planning and contraception (as the opportunity cost mothers' time spent raising children increases) which, in turn, ought to reduce family sizes and the premature loss of breadwinners through HIV/AIDS.

Acknowledgements

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