PREDICTORS OF POVERTY: A COMPARATIVE ANALYSIS OF LOW INCOME COMMUNITIES IN THE NORTHERN FREE STATE REGION, SOUTH AFRICA

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─ **Abstract** ─

Poverty is a global phenomenon and has proven difficult to resolve. Strategies to address it need to be focused on factors associated with poverty through local research as problems differ from region to region. Poverty, together with inequality and unemployment, is one of the three foremost developmental problems in South Africa. This paper presents an analysis of the predictors of poverty of low-income communities in the Northern Free State region, South Africa. Predictors, such as gender of head of household, type of dwelling, property ownership, housing subsidy, quality of service delivery, income and employment, were analysed to determine their impact on poverty in the study region with a specific focus on Zamdela, Kwakwatsi and Tumahole. A total of 2 678 households were included in the survey. The study used aggregate income of households to determine the status and level of poverty. A logistic regression was utilised to determine the impact of the various predictors of poverty. Of all these, the most significant for a household were found to be the gender of the head of the household and employment status. Strategies for poverty alleviation should be focused on local problems by means of local research. The implementation of appropriate policy and projects is also important for success.

Key Words: *households, logistic regression, Northern Free State, poverty*

JEL Classification: I32

1. INTRODUCTION

Alleviation of the global problem of poverty has proven to be difficult (Sekhampu, 2013:145). Strategies to do so have been on the forefront of efforts to improve the quality of life in developing countries (Cromwell et al., 2005:11). Globally, a total of 702 million people are still living below the poverty line of $2.00 per person per day (World Bank, 2015). The extent of the poverty crisis in South Africa was analysed by the International Fund for Agriculture Development (IFAD) (2011:5). It was found (at that time) that just 9.8% of the total population had never felt the impact of poverty. This situation exists, despite the most comprehensive social welfare programme in Africa since 1994 (Woolard & Klasen, 2007:866).

To provide proof of the importance of the eradication of poverty, both the Millennium Development Goals (MDG) (UN, 2003) and the new Sustainable Development Goals (SDG) (UN, 2015), launched in September 2015, focus on poverty reduction activities. Poverty, along with inequality and unemployment, has been identified as one of the three main problems which need to be addressed in South Africa, as listed in the National Development Plan (NDP) (National Planning Commission, 2011).

The World Bank (2001) defines poverty as a situation where an individual exercises limited or no control over commodities that are essential to achieve an acceptable standard of living. According to the Studies in Poverty and Inequality Institute (SPII) (2007:10), poverty could be regarded in either a narrow or a broad sense. In the narrow sense, poverty may be described as a lack of adequate income, while in the broader sense, it includes the aspects of housing, health, education and access to services and resources. Therefore, poverty studies should encompass a multi-dimensional approach (Alkire & Foster, 2009).

The question of why governments need to eliminate or alleviate poverty is addressed by Streeten (1998:2) who contends that prolonged and deep levels of deprivation lead to large scale socio-economic damage to a society. Streeten (1998:3) states the reasons to alleviate poverty are to enable a society to increase productivity and to create healthier environments. The research objectives of the study include: determining the poverty line, together with the extent of poverty; analysing the impact of the various predictors of poverty and listing a number of recommendations on how to alleviate poverty in the study region.

2. LITERATURE REVIEW

Many studies on the determinants or predictors of poverty as a multidimensional problem have been previously undertaken**.** The World Bank, in its Poverty Manual of 2005 (World Bank, 2005:132), listed the main determinants of poverty as: isolated rural settings with limited access to markets, lack of infrastructure and basic services, access to basic needs (clean water and sanitation, education, health, social facilities), household factors such as gender, age, asset base and income from work opportunities. The literature deals with a wide range of factors such as health, education, living standards, disempowerment, social exclusion, limited income and unemployment (Alkire, 2007:348). Sekhampu (2013:145) analysed several factors in an investigation of a low income township in South Africa. The study found that employment status, age of the head of the household and household size were significant predictors of poverty in the area. Factors that were not significant predictors of poverty in this study were: gender of head of household, marital status and level of education. In a study by Dunga and Sekatane (2014:215), also undertaken in an impoverished township in South Africa, it was found that the age of the head of the household, marital status, employment and the level of social-welfare grants received, significantly impact on the poverty status of a household.

Some of the main predictors of poverty included in this study:

Gender of head of household: According to Rogan (2016:987), the gender gap in income poverty has widened in post-apartheid South Africa, although overall poverty levels have declined. Female-headed households are increasingly worse off than male-headed households (Alkire et al., 2012; Geda et al., 2005).

Type of dwelling: According to Achia et al., (2010:42) the type of dwelling a family resides in, that is, a formal structure versus an informal one, contributes significantly to improved quality of life and poverty status. Iqbal et al., (2009:260) in a study carried out in Pakistan, also indicated that dwelling type has a significant positive impact on poverty status as well as on the ability of households to escape the poverty trap in the case of formal housing.

Ownership status (assets): According to Aliber (2001), the lack of accumulation of assets in the form of property, land and livestock contributes to poverty. In the South African context this aspect is particularly relevant as the apartheid policy enforced the loss of assets by the black African population, leading to massive

poverty (Sekhampu, 2013:146). Bogale et al., (2005) supported the notion that asset accumulation leads to poverty alleviation. A house or property functions as a shelter and as collateral for borrowing and could be used as a venue for income generation business operations (Mok et al., 2007:192).

Housing subsidy: In a study by Coley et al. (2013:1782), it was found that low-income households need to be assisted with housing through the provision of subsidised public housing. This view concurs with the findings of earlier research performed by Cross (2006) in South Africa, where it was reported that subsidised housing for the poor could alleviate poverty.

Quality of local government service delivery: Iqbal et al. (2009:261) reported that basic services in Pakistan, such as the provision of water, sewerage and electricity services, had a significant effect on poverty alleviation. In a study of developing countries, Wegelin and Borgman (1995:131) in support of other researchers, established that access to quality essential services greatly influences poverty alleviation. Gnade (2013:4) completed an analysis of the impact of basic infrastructure, in the form of essential services, of all South African municipalities. It was reported that basic infrastructure and essential services positively influence poverty and alleviate inequality.

Income levels: Increased levels of income, largely provided through employment opportunities, have a significant effect on the reduction of poverty (Mok et al., 2007:192). This finding concurs with that of Woolard and Klasen (2007:877) who discovered that households become poor if they lose their source of income, especially through job losses.

Employment: Findings by Dunga and Sekatane (2014:215), concerning Bophelong Township in South Africa, demonstrated that employment contributes to poverty alleviation in low income and high unemployment situations. This finding is supported by Islam (2004), ILO (2008), and Woolard and Klasen (2007:866) all of whom stated that employment is critical in that it is a source of livelihood and lifts impoverished people out of the poverty trap.

Household size: Larger sized households are positively related to higher levels of poverty and find it difficult to improve their status in this respect, due to the larger number of young children and the high cost of living regarding education, health and other social activities (Iqbal et al., 2009:264; Malik, 1996; Minot & Baulch, 2005). This finding is similar to that of Sekhampu (2013:150) mentioned above,

that larger households have a higher probability of being poor. This type of finding is also supported by Achia (2010:42) in Kenya.

3. METHODOLOGY

3.1. The study region.

The Northern Free State was selected as the study region due to its rural character with urban linkages, its proximity to the North-West University (NWU) Vaal campus as part of NWU's community involvement and the region's overall demonstration of national problems in development. The region is located in the northern part of the Free State Province, adjacent to and south of Gauteng Province and the Vaal River. Important towns in the region include Sasolburg, Kroonstad, Parys and Frankfort, with smaller secondary towns and townships throughout the region. Three individual townships have also been identified in the study region: Zamdela, part of Sasolburg, Kwakwatsi, part of Koppies and Tumahole which forms part of Parys. The main economic sectors in the region are agriculture, manufacturing and tourism. Table 1 summarises the main socio-economic statistics for South Africa and the study region for 2014. From the table it is evident that the study region is worse off if compared to the rest of South Africa in terms of the human development index (HDI) and per capita income. The region has a very high unemployment rate of close to 30%. However, the study area records a higher per capita GDP if compared to South Africa as a result of large industries in the region such as Sasol Industries (Meyer, 2013; Global Insight, 2015).

Table 1: Summary of the main socio-economic statistics for South Africa and the study region, 2014

Region	South Africa	Free State Province	Fezile Dabi District (also known as the Northern Free State)
Total population	53.8 million	2.8 million	0.504 million
Population growth 1996 to 2014 in %	1.3	0.1	0.4
HDI	0.63	0.60	0.60
Gini Coefficient	0.64	0.61	0.61
Number of people below the poverty line (% in brackets)	24.4 million (45.4)	1.3 million (46.9)	0.232 million (46.0)

Unemployment rate %	25.3	30.9	29.8
Annual average income per capita	R 48 323	R 40 955	R 43 729
GDP per capita at constant prices	R 55 944	R 56 869	R 89 670
Total trade (R1000)	- R 68.6 million	R 5.4 million	R 1.9 million

Source: Global Insight (2015).

3.2 Survey design

This study is based on a socio-economic household survey using questionnaires. A random sample of households was interviewed in the said Northern Free State region, including 12 low-income townships. Maps and aerial photos were compiled for all the townships included in the study, while sample stratification was designed on account of the geographical distribution of people in the area. A questionnaire was designed that included a number of sections, such as socio-economic descriptive information, as well as sections on poverty, employment and service delivery. Interviews were conducted with the head of the household by trained community workers in the region. Information obtained from respondents was kept confidential. A total of 2 678 households were interviewed by 30 trained fieldworkers.

3.3 Measurement of poverty

In the process of achieving the objective of analysing the predictors of poverty, a method was required for the measurement of income poverty. According to the World Bank (2001), a poor household receives an income of less than $2 per day per member of the household. Using the information on household size and household income, the household poverty status was calculated. The South African poverty measure for the year 2011 of R 450 per month (StatsSA, 2014) was adjusted for inflation for the year 2013 to a poverty line of R 530 per capita member of household per month. It was found that 1 477 (68.8 percent) of households in the sample were below this line while 669 (31.2 percent) of households were above it. In order to discover which variables form the predictors of income poverty in the low-income townships of the region, a logistic regression was utilised. This technique was selected due to the nature of the dependent variable, which is categorical.

3.4 Regression model

The said regression was performed to assess the impact of a number of factors on the likelihood that respondents would report their level of poverty. The dependent variable was the income poverty status of a household and was coded as 0 for income poverty below R 530 per month income per member of the household and 1 for income poverty above R 530 per month per member of household. The form of the logistic regression is listed as follows:

$$\text{Ln (INPOV)} = (p/1-p) = \emptyset_1 + \emptyset_2 GEN_i + \emptyset_3 DWETY_i + \emptyset_4 PROPOW_i + \emptyset_5 HOUSUB_i + \emptyset_6 HOUSIZ_i + \emptyset_7 EMP_i + \emptyset_8 SERQTY_i + \varepsilon_i \dots 1$$

The model contains seven independent variables: gender, type of dwelling, ownership status, housing subsidy, household size, employment and perception of quality of municipal services. The full model containing all predictors was statistically significant at $p < .001$, indicating a *"goodness of fit"* model. In other words, the model was able to distinguish between respondents' income poverty status. The model as a whole explained between 15.1 percent (Cox & Snell R Square) and 21.3 percent (Nagelkerke R Square) of the variance in income poverty status and correctly classified 72.6 percent of cases. As listed in Table 2, five of the seven independent variables made a statistically significant contribution to the model, that is: gender, dwelling type, property ownership, household size and employment. The strongest indicator of reporting income poverty was gender, recording an odds ratio of 3.36.

Table 2: List of the variables and their descriptions

Dependent variable	Variable description	Notes (coding)
Income poverty (INPOV)	Household income based poverty measure.	0=poor (R0 to R 530 per month per member of household) 1=non poor (more than R 530 per month per member of household)
Gender (GEN)	Gender of head of household.	Female=0, Male=1
Dwelling type (DWETY)	The type of dwelling the household resides in.	Formal=0 Shack=1
Property ownership (PROPOW)	The type of ownership status for head of household.	Owners with deed=0 Owners with no deed=1 Rented=2
Housing subsidy (HOUSUB)	Status of housing subsidy for household.	Yes=0 No=1

Household size (HOUSIZ)	Household size measured by the number of people in household,	Continuous variable
Employment (EMP)	The total number of employed people in the household.	Continuous variable
Service delivery quality (SERQTY)	The level of service delivery, regarding essential basic services, by the local government.	Good=0 Bad=1 Uncertain=2

4. RESULTS AND DISCUSSION

This section provides the results and discussion of the statistical analysis in terms of the descriptive analysis as well as the results and discussion of the logistic regression for the study area (Table 4).

4.1 Descriptive analysis

Table 3 furnishes a summary of the descriptive statistics of the low-income areas in the total study area and a comparison between Zamdela, Kwakwatsi and Tumahole Township areas. Some of the interesting observations stemming from this Table include:

- *Head of household:* More than 50% of the heads of households are female (54.9%) in low-income areas in the total study region. Of the three township areas, Tumahole has the highest female head of household ratio: 63%. This relatively high ratio could be due to the ongoing dysfunctionality of families as a result of migrant labour.
- *Type of dwelling:* The region is well provided for in terms of the provision of housing. More than 77% of households in low-income areas in the region reside in formal brick houses, while only 18.8% of households reside in informal housing units. Of the three townships being compared, Kwakwatsi is worst off in terms of housing provision with 28.9% residing in informal units.
- *Ownership status:* Most households, close to 89%, have ownership of the residential property in which they reside. In some cases the owners are still awaiting the final title deed, but that process is a formality and in progress.
- *Housing subsidy:* A housing subsidy is one of the grants for low-income households in South Africa. More than 42% of all low-income households in the study region have received housing subsidies and therefore own a small formal dwelling.

- *Perception of quality of local government service delivery:* Most low-income households in the region were dissatisfied with the level of service delivery regarding essential services such as water, sewer, electricity and roads. More than 65% of households are dissatisfied or uncertain regarding service delivery. The Kwakwatsi area was the most dissatisfied, with only 14.3% of households being content with service delivery.
- *Income levels:* Income levels are low in this region and most households are subsisting below the poverty line. In the total region investigated, almost 69% of households included in the survey were found to be below this line with a household income of less than R 530 per month per member of household. The Kwakwatsi area has the most people living below the poverty line at 71.8%. The results indicate the continuing extremely high levels of poverty especially in rural South Africa.
- *Employment:* Low-income areas record a positive relationship between high levels of poverty and high levels of unemployment. Overall levels of unemployment is high and Kwakwatsi was shown to be worst off, reporting the highest levels of unemployment. Rural unemployment in South Africa is high and this is also the case in the low-income areas of the study region.
- *Average household size:* The average household size in the region is 3.75 persons, which comprises relatively large households. The research indicated that large households are generally poorer than smaller households. As could be expected, Kwakwatsi reported the largest average households in the region, if other indicators are taken into account.

Table 3: Descriptive statistics from the study region

Variables	Sub-variables	Total region (n=2678)	Zamdela (urban area) (n=855)	Kwakwatsi (rural area) (n=142)	Tumahole (rural area) (n=360)
Gender of head of household	Male	45.1	49.7	45.6	37.0
	Female	54.9	50.2	54.4	63.0
Type of dwelling	Formal brick house	77.4	76.8	71.1	76.7
	Informal dwelling (shacks)	18.8	20.2	28.9	15.4
	Other	3.8	3.0	0.0	7.9
Ownership status	Ownership with title deed	51.9	61.1	35.8	35.2

Variables	Sub-variables	Total region (n=2678)	Zamdela (urban area) (n=855)	Kwakwatsi (rural area) (n=142)	Tumahole (rural area) (n=360)
	Ownership with no title deed	37.2	27.1	53.4	50.4
	Rental	6.9	7.6	9.5	9.2
	Other	4.0	4.1	1.4	5.2
Housing subsidy	Yes	42.2	40.9	28.9	42.6
	No	57.8	59.1	71.1	57.4
Perception on quality of municipal services	Yes	33.9	25.2	14.3	38.8
	No	50.3	64.0	68.7	47.6
	Uncertain	15.8	10.8	17.0	13.5
Poverty level (income based)	R0 to R 530 per month per member of household	68.8	56.4	71.8	69.4
	R 530 or more per month per member of household	31.2	43.6	28.2	30.6
Employment	(average employed people per household)	1.79	1.88	1.64	1.84
Average household size		3.75	3.54	3.89	3.88

Source: Meyer, Household survey, (2013).

4.2 Regression analysis

This section provides information regarding the results and discussions of the logistic regression. The regression indicates the predictors of being impoverished. The following results were recorded for the total study region:

- *Gender of head of household:* This is a significant predictor of the status of poverty of a household at **1% (p=0.001)** significance level. The coefficient of **1.212** indicates a positive relationship between a male-headed household and receiving income above the poverty line. Being part of a male-headed household means that the probability of being above the income poverty line is **3.36** times more likely than for female-headed households. The results of this survey are similar to the majority of findings in the literature. Research carried out by Rogan (2016:987), Alkire et al., (2012) and Vijaya et al., (2014) also established that male headed households are more likely to receive income above the poverty line if compared to female headed households.

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- *Dwelling type:* The type of dwelling where the household resides is a significant predictor of the status of poverty of a household at **1% (p=0.001)** significance level. The coefficient of **-0.584** indicates a negative relationship between a household living in an informal dwelling (shack) and being in receipt of income above the poverty line. For a household living in a formal dwelling, the probability of being above the income poverty line is **0.557** times more likely than for households living in informal dwellings. The literature indicates similar results with the findings of Achia et al. (2010:42), Iqbal et al. (2009:260) and Coley et al. (2013:1775).

- *Property ownership status:* Owning a property is not a significant predictor of the status of poverty of a household at more than **10% (p=0.251)** significance level. The coefficient of **0.246** indicates a positive relationship between owning a property and income above the poverty line. Although the research did not establish asset ownership as a significant predictor of poverty, the literature indicates this variable to be an important poverty alleviation factor. Many researchers, including Aliber (2001), Mok et al., (2007:192) and Sekhampu (2013:146) found that asset and property ownership has a positive impact on poverty alleviation.

- *Housing subsidy:* Receiving a housing subsidy, by qualifying due to low household income, is not a significant predictor of the status of poverty of a household at more than **10% (p=0.129)** significance level. The coefficient of **-0.173** indicates a negative relationship between receiving a housing subsidy and being above the income poverty line. The literature on this aspect is divided: while in some cases subsidised housing programmes have contributed to poverty alleviation (Coley et al., 2013:1782), it is important to note that effective implementation is required (Cross, 2006).

- *Household size:* Household size is a significant predictor of the status of poverty of a household at **1% (p=0.001)** significance level. The coefficient of **0.096** indicates a positive relationship between larger household sizes and receiving household income above the poverty line. Being part of a larger household means that the probability of being above the income poverty line is **1.100** times more likely than for smaller households. The findings contradict the general findings in the literature where larger

households are positively related to higher levels of poverty (Sekhampu, 2013:150; He et al., 2010:338; Achia, 2010:42). Widyani et al. (2009) argued that the relationship between poverty and household size could be positive or negative while in some cases, larger households might obtain income above the poverty line (Kamuzora & Gwalema, 1998; SALGA, 2010).

- *Employment:* Employment of the head of the household is a significant predictor of the status of poverty of a household at **1% (p=0.001)** significance level. The coefficient of **0.556** indicates a positive relationship between a household with an employed head of the household and income above the poverty line. Being part of a household where the head is employed means that the chance of being above the income poverty line is **1.745** times more likely than for households where the head is unemployed. The findings from the research are consistent with findings in the literature, where employment is critical for poverty alleviation, including those of Woolard and Klasen (2007:866), and ILO (2008).

- *Perceptions of quality of service delivery:* The perceptions of the head of the household regarding the quality of services delivered are not a significant predictor of the status of poverty of a household at more than **10% (p=0.242)** significance level. The coefficient of -**0.132** indicates a negative relationship between the perceptions, by the head of the household, of poor service delivery and income above the poverty line. Being part of a household with good service delivery means that the probability of being above the income poverty line is **1.141** times more likely than for households with poor service delivery. The findings from the research are consistent with the findings in the literature, which indicates that the delivery of quality basic essential services does have a positive impact on alleviation of poverty (Iqbal et al., 2009:261; Gnade, 2013:4).

Table 4: Logistic regression predicting likelihood of being in poverty: Total study region

Variable	β	S.E	Wald (t)	p-value	Exp (β)	Notes (coding)
Gender	1.212	0.105	134.010	0.001	3.362	Female=0 Male=1
Dwelling type						
Formal (reference)			20.323	0.000		Formal=0
Informal (shack)	-0.584	0.152	14.865	0.000	0.557	Shack=1
Property ownership						

Variable	β	S.E	Wald (t)	p-value	Exp (β)	Notes (coding)
Owner with title deed (reference)			11.482	0.009		Owners with deed=0
Owner with no title deed	-0.315	0.116	7.329	0.007	0.730	Owners with no deed=1
Rented no ownership	0.246	0.214	1.317	0.251	1.278	Rented=2
Housing subsidy	-0.173	0.114	2.300	0.129	0.841	Yes=0 No=1
Household size	0.096	0.029	10.593	0.001	1.100	Continuous variable
Employment	0.556	0.056	97.681	0.001	1.745	Continuous variable
Service delivery quality						
Good (reference)			4.363	0.113		Good=0
Bad	-0.132	0.113	1.369	0.242	1.141	Bad=1
Uncertain	-0.183	0.169	1.183	0.277	0.832	Uncertain=2
Constant	-2.541	0.184	190.668	0.000	0.079	

The regression results for the total study region were compared with the results of the three townships of Zamdela, Kwakwatsi and Tumahole. The results are similar, revealing just a few differences: that gender and employment as variables were not significant predictors of poverty in Kwakwatsi while the dwelling type and housing subsidy were not significant predictors of poverty in Zamdela. The rest of the variables were all consistent in the regressions as performed for the total area.

5. CONCLUSION AND RECOMMENDATIONS

The study investigated the predictors of poverty in various low income communities in the Northern Free State. The extent of the results and analysis of the depth of poverty within the study area indicates the urgent need for improved policy interventions. Poverty, combined with inequality and unemployment, is one of the three main problems in South Africa as also identified in the National Development Plan (NDP)(National Planning Commission, 2011). It is a phenomenon that breaks down a community and leads to major social-welfare problems (Bradshaw, 2006). It is largely caused by the extremely high levels of unemployment in the country and in the study region. The "war" on poverty must be an integrated and comprehensive process and requires well implemented strategies within communities (National Planning Commission, 2011). Public

policy should be concerned with alleviating people's poverty as well as with placing them in a life-satisfying situation and environment (Rojas, 2008:1078).

Gender equality still requires additional policy development. Rogan (2016:987) states that greater investment should be considered in health care provision, improved childcare assistance, support for business development as regards women and the delivery of basic services to provide for the basic needs of the marginalised communities. This type of policy direction will specifically assist in the matter of gender equality. Employment opportunities and job creation with income generation strategies will aid in the alleviation of poverty. Employment, after the factor identified, the gender of the head of the household, is the second most important predictor of alleviation of poverty. Job creation strategies should focus on labour intensive job opportunities and support for small business development (Mok et al., 2007:194). Education and training should also be intensified in order to reduce poverty, leading to employment and income (Mok et al., 2007:194). Property ownership and the type of dwelling in which a household resides are also linked to the delivery of essential services. Although not all of the variables included in the study were significant predictors of poverty, the literature indicates that quality formal housing and service provision could significantly contribute to service delivery. The contribution of the study is that previous results on poverty are confirmed and the results allow for strategy development in the study region.

Future research is needed to yield more results on poverty predictors in South Africa and to determine where poor communities have actually been lifted out of the poverty trap. The variables used in this study include some of the most important predictors of poverty, but other variables also have an impact on poverty. One such variable is education, since findings indicate that where higher levels of education are attained by the head of the household, these lead to a decrease in poverty levels (Iqbal et al., 2009:268; Achia, 2010:42). Moreover, locality, with regard to urban and rural areas (Achia, 2010:43) and age, are variables since in Pakistan, Iqbal et al. (2009:264) established that poverty levels reduce as the age of the head of the household increases (Achia, 2010:42).

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