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# Multidimensional Poverty Indicator and Its Determinants in Rural South Africa

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**Abstract:** Poverty is prevalent among South African households and it is multidimensional in nature. This study therefore constructed indicator of multidimensional poverty and analyzed its determinants in rural South Africa. Data were obtained from the South African Demographic and Health Survey (SADHS) for 2016. The Alkire-Foster (AF) was used to compute multidimensional poverty indicator (MPI) and Tobit regression method was used to analysis its determinants. The results revealed that majority of the rural dwellers in KwaZulu-Natal were poor (93%). Eastern Cape and Limpopo provinces had 92% and 90% poverty rates respectively, while Western Cape had 61%. In addition, the results also showed that an average rural dweller in KwaZulu-Natal and Limpopo provinces were deprived in 76% of the weighted indicators, while North West and Mpumalanga provinces were each deprived in 70% of the weighted indicators. The Tobit regression results indicated that as size of household, male household headship, age and some provincial variables significantly explained MPI. Conclusively, a good percentage of the South African rural population were living in poverty. It was recommended that government should prioritise alleviating rural poverty with focus on regional, age and maternal fertility.

**Keywords:** Rural Households; Multidimensional Poverty Indicator; Tobit Regression; South Africa

**JEL Classification:** P46

## 1. Introduction

Poverty is endemic in sub-Saharan Africa (SSA) where 433 million people lived on less than US$1.90 a day in 2018 (Schoch and Lakner, 2020). In the absence of serious intervention, it had been projected that by 2030, nearly 9 out of 10 extremely poor people will be in SSA (World Bank, 2019). It had been estimated that based on upper poverty line, poverty incidence in South Africa was 56% (Stats SA, 2017). Therefore, poverty reduction is at the heart of development policies and programs of South African democratic government since 1994. The government had intervened in reducing poverty through some marginal reforms targeting the poorest of the poor through universal basic education, access to medical services, social grants, low cost housing projects, among others (Hurlbut, 2018).

Measurement of poverty in South Africa had relied on the use of households' expenditures, from which poverty lines are computed. These lines assume unidimensional monetary measures in classifying poverty without providing a comprehensive picture of poverty from the multidimensional perspectives

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(Katumba, 2018). Due to some perceived weaknesses of the money-metric poverty measurement approaches, the measurement of poverty using multidimensional approach has recently gained international recognition and acceptance. This approach provides a comprehensive evaluation of the degree of deprivations that households suffer in a set of distinct welfare indicators (Alkire & Foster, 2011).

South African government has made significant progress in reducing poverty since the inauguration of democratic governance since 1994. However, between 2011 and 2015, the poverty level increased thereby threatening to erase already achieved welfare enhancement progresses (Hurlbut, 2018). Poverty is multifaceted; hence its definition extends beyond some composite monetary indicators (Chen et al., 2019; Saunders, 2011). Poverty can be chronic owing to its prolonged nature with nonmonetary indicators such as poor education, high morbidity rate, high death rate and anthropometric status of the household in a given population, poor access to basic infrastructures, poor household security and poor nutrition (Fransman & Yu, 2019).

Although South Africa is an upper middle-income country, its poverty rate is high (Lloyd-Sherlock *et al.*, 2012). Hurlbut (2018) submitted that poverty is influenced by race, education, employment status, gender and household size. Poverty is more pronounced among rural dwellers especially those residing in the informally organized traditional and homelands. Precisely, about 35.6% of South African households are residing in rural areas and depend essentially of farming as their major source of livelihoods. These black farmers are largely poor due to low incomes they are earning from farming (Pauw, 2007; World Bank, 2019). The prevalence of poverty in rural areas predisposes them to multiple disadvantages (Alkire et al., 2015). Ghalib et al. (2015) noted that poverty can predispose some households to poor access to basic financial services, which may also undermine their ability to receive proper medical services.

Multidimensional approach to poverty measurement is recently favoured because of its holistic consideration of different dimensions of households' welfare which are broadly categorized as population health, education and living standard (Victor et al., 2014). Inclusion of these indicators provides broad information regarding poverty measurement in order to provide adequate measures for its alleviation (Khan et al., 2015). Hence, it is vital to precisely identify the most deprived groups and implement suitable poverty-reduction strategies to improve their livelihood (Fransman and Yu, 2019). On that premise, this study seeks to analyze multidimensional poverty in rural South Africa. This study is important from the fact that although this approach is relevant to some targets in the Sustainable Development Goals (SDGs), there exists a paucity of information on multidimensional poverty index of rural dwellers in South Africa. This study will not only add to the discussions on multidimensional poverty in South Africa, but will guide policy framework to implement marginal programmes and reforms for poverty reduction among the poor in rural South Africa. The study was guided by two research questions. The first is what are the indicators of multidimensional poverty in rural South Africa? The second is what are the factors influencing multidimensional poverty in rural South Africa?

## 2. Materials and Methods

### 2.1. The Data

This study used the data for the 2016 South Africa's Demographic and Health Survey (DHS). The sampling methods of the data had bee exhaustively presented by National Department of Health (NDoH) et al., (2018). The survey probed into different forms of welfare indicators for the country as a whole covering rural and urban areas. The data were collected with stratified two-stage sample design using probability proportional to size. At the first stage, primary sampling units (PSUs) were selected, while dwelling units (DUs) were systematically sampled at the second stage using the 2011 Census enumeration areas. In the course of data collection, 15,292 households were selected. The response rate was 83% given that 11,083 of the 13,288 occupied households successfully completed the survey. However, in non-urban areas, 5745 dwellings were selected of which 4891 were occupied. The response rate was 92.6% as 4527 households completed the survey (National Department of Health (NDoH) et al., 2018).

### 2.2. Multidimensional Poverty Index

This study adopts the Alkire-Foster (AF) method for constructing indicators of multidimensional poverty. The general framework used in AF for measuring multidimensional poverty include selection of welfare dimensions and the indicators, determination of dimensional cut-offs and weights, and determination of poverty cut-off (Alkire and Foster, 2011). The choice of the welfare dimensions is influenced by people's perceived necessities, global recognition and data availability. Each selected dimension is linked to indicator(s) based on principles of accuracy and parsimony. This implies selection of many indicators as possible without complicating the data analysis for policy purposes and transparency. Table 1 contains the dimensions, indicators; deprivation cut-offs and assigned weights for the determination of multidimensional poverty in this study.

The Alkire-Foster method employs three measures in determining multidimensional which are poverty headcount (H), intensity (I) and multidimensional poverty index (MPI) which is a product of H and I (Mushongera et al., 2017).

**Table 1. The Dimensions, Indicators, Deprivation Cut-Offs and Assigned Weights**

| Dimension | Indicator | Deprivation cut-off | Weight |
|---|---|---|---|
| Standard of living | **1.** Source of drinking water | If no piped water in dwelling or on stand | 1/18 |
| | **2.** Type of toilet facility | If not a flush toilet | 1/18 |
| | **3.** Asset ownership | | |
| | (a) Has electricity | | 1/126 |
| | (b) Has radio | | 1/126 |
| | (c) Has television | | 1/126 |
| | (d) Has refrigerator | | 1/126 |
| | (e) Has bicycle | | 1/126 |

| | | | | |
|---|---|---|---|---|
| | | (f) Has motorcycle/scooter | | 1/126 |
| | | (g) Has car/truck | | 1/126 |
| | **4.** | Type of cooking fuel | If the household is using paraffin/wood/coal/dung/ other /none | 1/18 |
| | **5.** | Type of fuel used for heating | If the household is using paraffin/wood/coal/dung /other/none | 1/18 |
| | **6.** | Type of dwelling | If an informal shack/traditional dwelling/caravan / tent/other | 1/18 |
| Education | **1.** | Education attainment | If any household member did not complete secondary school | 1/3 |
| Economic activity | **1.** | Wealth index combined | if household is rated poor | 1/3 |

Computation of MPI begins with scoring of each of the indicators so that zero is assigned when not deprived and 1 when deprived. The weighted scores of these indicators is computed as:

$c_i = w_1 I_1 + w_2 I_2 + \ldots + w_d I_d$

where $I_i$ =1 if the person is deprived in indicator $i$ and $I_i$ = 0 otherwise, and $w_i$ is the weight

attached to indicator $i$ with $\sum_{i=1}^{d} wi = 1$. A poverty cut-off ($k$) is to be defined in order identify those who are multidimensionally poor. Poverty is defined as a case where c$i \geq k$. Following Alkire and Foster (2011), in this study $k$ is set at 1/3. Multidimensional headcount ratio (H) is computed as:

$H = \frac{q}{n}$

$q$ is the number of households who are poor and $n$ is the total number of households.

The intensity of poverty is the average deprivation score of the multi-dimensionally poor people and can be expressed as:

$I = (\sum_{i=1}^{n} ci(k))/q$

$c_i(k)$ is the households' censored deprivation score and $q$ had been previously defined. The MPI is the product of $H$ and $I$.

### 2.3. Tobit Regression Model

Tobit regression was used to analyse the determinants of MPI. This is because of the censored nature of the indicator with $0 \leq PMI \leq 1$.

$MPI = \alpha + \beta \sum Xi + ei$

Where α and β are the estimated parameters. Xi are the explanatory variables which are household size, residence in Eastern Cape (yes = 1, 0 = otherwise), residence in Northern Cape (yes = 1, 0 = otherwise), residence in Free State (yes = 1, 0 = otherwise), residence in Kwazulu-Natal (yes = 1, 0 = otherwise), residence in Gauteng (yes = 1, 0 = otherwise), residence in Mpumalanga (yes = 1, 0 = otherwise), residence in Limpopo (yes = 1, 0 = otherwise), gender (male =1, 0 = otherwise), Livestock husbandry (yes 1, 0 = otherwise) and age of household heads (years). ei is the stochastic error term.

## 3. Results and Discussion

### Descriptive statistics of selected variables

Table 2 shows that the largest number of sampled households in rural South Africa in the dataset came from Limpopo province with 1131 (25%). KwaZulu-Natal and Mpumalanga provinces followed with 747 (16.5%) and 716 (15.8%) respectively. The age of the heads of the households ranged from 15 to 95 years. Those in the 40 < 50 years age bracket constitute 19.46% while 50 < 60 years accounts for 18.67%. Female headed households were 49.6%. The number of household members ranged from 1 to 20 with those with between 1 to 5 persons accounting for 77.38%. The number of household members without children 5 years and under was 63.38% and this was followed by households that had 2 children and below with 24.54%. Among the sampled households, 64.3% owned livestock, herds or farm animals.

**Table 2. Descriptive statistics of the respondents (total sample = 4527)**

| Variables | | Frequency | % |
|---|---|---|---|
| Province | Western cape | 38 | 0.83 |
| | Eastern cape | 696 | 15.40 |
| | Northern cape | 255 | 5.60 |
| | Free State | 144 | 3.20 |
| | KwaZulu- Natal | 747 | 16.50 |
| | North west | 685 | 15.13 |
| | Gauteng | 115 | 2.54 |
| | Mpumalanga | 716 | 15.80 |
| | Limpopo | 1131 | 25.00 |
| Age of head of household | | | |
| | < 30 | 520 | 11.49 |
| | 30 < 40 | 788 | 17.40 |
| | 40 < 50 | 881 | 19.46 |
| | 50 < 60 | 845 | 18.67 |
| | 60 < 70 | 747 | 16.50 |
| | 70 < 80 | 457 | 10.10 |
| | 80 < 90 | 221 | 4.88 |
| | ≥ 90 | 39 | 0.86 |
| | Don't know | 29 | 0.64 |
| Sex of head of household | | | |
| | Male | 2247 | 49.6 |
| | Female | 2280 | 50.4 |
| Number of household member | | | |
| | 1 to 5 | 3503 | 77.38 |
| | 6 to 10 | 923 | 20.40 |
| | 11 to 15 | 90 | 1.99 |
| | 16 to 20 | 11 | 0.23 |
| Number of children 5 and under (de jure) | | | |
| | 0 | 2869 | 63.38 |
| | 1 and 2 | 1111 | 24.54 |
| | 3 < 5 | 538 | 11.88 |
| | 5 < 7 | 8 | 0.18 |
| | ≥ 7 | 1 | 0.02 |
| Own livestock, herds or farm animal | | | |
| | No | 2909 | 64.3 |
| | Yes | 1618 | 35.7 |

## 4. Construction of Multidimensional Poverty Index

Table 3 shows that the highest multidimensional head count ratio was 93% for KwaZulu-Natal province. Eastern Cape province had 92% and Limpopo province had 90%. The lowest multidimensional headcount was for Western Cape province with 61%. The intensity of the poverty showed that an average rural dweller in Eastern Cape province was deprived in at least 81% of the weighted indicators. An average rural dweller in KwaZulu-Natal and Limpopo provinces was deprived in 76% of the weighted indicators, while North West and Mpumalanga provinces were each deprived in 70% of the weighted indicators. The average rural dweller in Western Cape province had 40% deprivation in the weighted indicators. The MPI represents the share of the population that is multidimensionally poor adjusted by the intensity of the deprivation suffered (Santos and Alkire, 2011). The MPI is also called the Adjusted Headcount Ratio (Alkire and Foster, 2011a).

**Table 3. Multidimensional Poverty in the Rural Areas of South African Provinces**

| Province | Household sampled | Poor household | H | I | MPI |
|---|---|---|---|---|---|
| Western Cape | 38 | 23 | 0.61 | 0.40 | 0.24 |
| Eastern Cape | 696 | 637 | 0.92 | 0.81 | 0.74 |
| Northern Cape | 255 | 217 | 0.85 | 0.66 | 0.56 |
| Free State | 144 | 122 | 0.85 | 0.63 | 0.53 |
| KwaZulu-Natal | 747 | 696 | 0.93 | 0.76 | 0.70 |
| North West | 685 | 594 | 0.87 | 0.70 | 0.61 |
| Gauteng | 115 | 99 | 0.86 | 0.63 | 0.54 |
| Mpumalanga | 716 | 608 | 0.85 | 0.70 | 0.60 |
| Limpopo | 1131 | 1019 | 0.90 | 0.76 | 0.69 |

H = head count ratio, I = intensity of poverty and MPI = multidimensional poverty index

Table 3 further shows the adjusted headcount ratio denoted as MPI. These results showed that 74% of rural dwellers in Eastern Cape province are poor multidimensionally, which was followed by KwaZulu-Natal and Limpopo provinces with 70% and 69%, respectively. In Western Cape province, 24% of were poor multidimensionally. Western Cape province had the least MPI (0.24). The findings from this study align with the report of Fransman and Yu (2019) on multidimensional poverty in South Africa. The authors identified Eastern Cape, KwaZulu-Natal and Limpopo as the provinces with highest MPI poor and Western Cape as the province with the lowest MPI poor.

## 5. Multidimensional Poverty Index Decomposition

With regard to poverty, it is important to accurately identify the most deprived areas and effectively target these areas by implementing appropriate poverty-reduction strategies (Fransman & Yu, 2019). The contributions of each indicator to the provincial MPI are presented in Table 4. The indicator, education attainment made the highest contribution to the MPI across the nine provinces in rural South Africa. This was followed by wealth index, type of toilet facility and type of fuel used for heating.

**Table 4. Contribution (%) of the Indicators to the MPI**

| Dimension | Indicator | WC | EC | NC | FS | KZN | NW | GT | ML | LP |
|---|---|---|---|---|---|---|---|---|---|---|
| Standard of living | **1.** Source of drinking water | 0.6 | 3.9 | 0.7 | 0.2 | 2.0 | 0.9 | 0.4 | 1.5 | 2.6 |
| | **2.** Type of toilet facility | 0.0 | 6.5 | 5.6 | 6.5 | 6.7 | 6.9 | 7.1 | 7.0 | 7.2 |
| | **3.** Asset ownership | | | | | | | | | |
| | (a) Has electricity | 0.0 | 0.3 | 0.2 | 0.2 | 0.3 | 0.2 | 0.3 | 0.1 | 0.0 |
| | (b) Has radio | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 | 0.6 | 0.5 | 0.5 |
| | (c) Has television | 0.2 | 0.5 | 0.4 | 0.5 | 0.5 | 0.5 | 0.4 | 0.3 | 0.3 |
| | (d) Has refrigerator | 0.2 | 0.6 | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.3 | 0.3 |
| | (e) Has bicycle | 1.8 | 1.0 | 1.1 | 1.2 | 1.0 | 1.0 | 1.2 | 1.1 | 1.1 |
| | (f) Has motorcycle/ scooter | 2.0 | 1.0 | 1.2 | 1.2 | 1.0 | 1.1 | 1.3 | 1.1 | 1.1 |
| | (g) Has car/truck | 1.7 | 0.9 | 1.0 | 1.1 | 1.0 | 1.0 | 1.1 | 1.0 | 0.9 |
| | **4.** Type of cooking fuel | 0.0 | 2.6 | 1.9 | 1.5 | 2.4 | 1.7 | 0.4 | 2.8 | 4.5 |
| | **5.** Type of fuel used for heating | 0.0 | 4.8 | 6.2 | 3.5 | 5.9 | 5.9 | 5.1 | 7.1 | 7.1 |
| | **6.** Type of dwelling | 1.2 | 0.1 | 0.6 | 0.8 | 0.9 | 1.8 | 3.0 | 0.5 | 0.2 |
| Education | Education attainment | 84.4 | 38.5 | 46.1 | 48.9 | 40.0 | 43.4 | 44.7 | 43.7 | 38.0 |
| Economic activity | Wealth index combined | 7.3 | 38.8 | 34.0 | 33.6 | 37.4 | 34.7 | 33.9 | 33.1 | 36.1 |

*(Note- WC = Western Cape, EC = Eastern Cape, NC = Northern Cape, FS = Free State, KZN = KwaZulu-Natal, NW = North West, GT = Gauteng, ML = Mpumalanga and LP = Limpopo)*

In Western Cape province, education attainment contributed 84.4% to the MPI and was followed by wealth index with 7.3%. Type of toilet facility, type of cooking fuel, type of fuel used for heating and access to electricity did not contribute to MPI in Western Cape province. In Eastern Cape province, education attainment and wealth index contributed 38.5% and 38.8%, respectively to the MPI. These were followed by type of toilet facility (6.5%) and type of fuel used for heating (4.8%). Sources of drinking water had the highest contribution of 3.9% in Eastern Cape province, followed by 2.6% and 2% in Limpopo and KwaZulu-Natal provinces. Type of toilet facility contributed 7.2% in Limpopo province, 7.1% in Gauteng province and zero percent in Western Cape province. The highest contribution of type of cooking fuel was found in Limpopo province (4.5%) followed by Mpumalanga province (2.8%). In addition, the highest contribution of type of fuel used for heating were found in Limpopo and Mpumalanga provinces. The contribution of type of dwelling was more pronounced in Gauteng province (3%) followed by North West Province (1.8 %) and Western Cape Province (1.2%).

The percentages of the households deprived in each indicator across the nine provinces of rural South Africa are presented in Table 5. Considering the multidimensionally poor in rural Western Cape province, 60.5% of them were deprived in education attainment as well as in ownership of motorcycle/scooter; 50% of them do not own a car/truck while only 18.4% of them do not own radio. The rural dwellers in Western Cape province had access to electricity, flush toilet and uses electricity, solar energy or paraffin as fuel for cooking and heating. More than half (52.2%) of the multidimensionally poor in Eastern Cape province did not have access to piped water for drinking, 86.6 % did not have access to flush toilet; 64.2% did not heat their house with electricity or solar energy and 85.6% did not complete secondary education.

In KwaZulu-Natal province, 84.5% of the MPI poor did not complete their secondary education, 86.1% did not own car, motorcycle or bicycle, 85.3 % did not have access to flush toilet, and 25.7 % did not access their drinking water from a piped water. The MPI poor in Limpopo province showed 79.8% deprivation in education attainment, more than 80% deprivation in ownership of car, motorcycle or bicycle, 89.5 % did not have access to flush toilet and 32.5% did not access their drinking water from piped water. In North West province, 79.4% of the multidimensionally poor did not complete secondary school, more than 75.5% did not own car, motorcycle or bicycle while 75.3% did not use flush toilet and 65% did not heat their house with electricity or solar energy.

**Table 5. Percentage of the Households Deprived in each of the Indicators in Rural South Africa**

| Dimension | Indicator | WC | EC | NC | FS | KZN | NW | GT | ML | LP |
|---|---|---|---|---|---|---|---|---|---|---|
| Standard of living | **1.** Source of drinking water | 2.6 | 52.2 | 6.7 | 2.1 | 25.7 | 9.5 | 4.3 | 16.2 | 32.5 |
| | **2.** Type of toilet facility | 0.0 | 86.6 | 56.9 | 61.8 | 85.3 | 75.3 | 68.7 | 75.6 | 89.5 |
| | **3.** Asset ownership | | | | | | | | | |
| | (a) Has electricity | 0.0 | 26.1 | 11.0 | 11.8 | 22.4 | 13.9 | 21.7 | 9.5 | 2.5 |
| | (b) Has radio | 18.4 | 52.7 | 45.5 | 30.6 | 41.6 | 40.3 | 40.0 | 34.1 | 46.8 |
| | (c) Has television | 5.3 | 47.8 | 28.6 | 34.0 | 41.2 | 34.6 | 27.0 | 22.2 | 27.6 |
| | (d) Has refrigerator | 5.3 | 51.6 | 26.7 | 30.6 | 43.6 | 34.6 | 33.9 | 19.8 | 21.8 |
| | (e) Has bicycle | 55.3 | 89.7 | 78.0 | 79.9 | 90.4 | 80.0 | 80.0 | 80.0 | 92.4 |
| | (f) Has motorcycle/ scooter | 60.5 | 91.1 | 84.7 | 82.6 | 92.8 | 86.3 | 85.2 | 84.6 | 99.3 |
| | (g) Has car/truck | 50.0 | 84.8 | 69.4 | 72.9 | 86.1 | 75.5 | 73.0 | 73.2 | 81.5 |
| | **4.** Type of cooking fuel | 0.0 | 35.1 | 19.2 | 13.9 | 30.5 | 18.7 | 4.3 | 29.9 | 55.3 |
| | **5.** Type of fuel used for heating | 0.0 | 64.2 | 63.1 | 33.3 | 74.8 | 65.1 | 49.6 | 76.0 | 87.7 |
| | **6.** Type of dwelling | 5.3 | 1.9 | 6.3 | 7.6 | 11.1 | 19.3 | 28.7 | 5.4 | 2.4 |
| Education | Education attainment | 60.5 | 85.6 | 77.6 | 77.8 | 84.5 | 79.4 | 72.2 | 78.1 | 79.8 |
| Economic activity | Wealth index combined | 5.3 | 86.2 | 57.3 | 53.5 | 79.0 | 63.4 | 54.8 | 59.1 | 76.8 |

*WC = Western Cape, EC = Eastern Cape, NC = Northern Cape, FS = Free State, KZN = KwaZulu-Natal, NW = North West, GT = Gauteng, ML = Mpumalanga and LP = Limpopo*

**Determinants of Multidimensional Poverty Using Tobit Regression**

**Table 6. Tobit Regression Results of the Determinants of MPI**

| MPI | Coef. | Std. Err. | t-statistics | p>\|t\| |
|---|---|---|---|---|
| Household Size | 0.0076996*** | 0.0008159 | 9.44 | 0.000 |
| Region | | | | |
| Eastern Cape | 0.0831167*** | 0.0227955 | 3.65 | 0.000 |
| Northern Cape | 0.0249882 | 0.0236811 | 1.05 | 0.292 |
| Free State | 0.0569730** | 0.0227083 | 2.30 | 0.022 |
| KwaZulu-Natal | 0.1055477*** | 0.0227083 | 4.65 | 0.000 |
| North West | 0.0593409*** | 0.0226791 | 2.65 | 0.009 |
| Gauteng | 0.0392334 | 0.0254295 | 1.54 | 0.123 |
| Mpumalanga | 0.0540401** | 0.0226860 | 2.38 | 0.017 |
| Limpopo | 0.0523105** | 0.0224920 | 2.33 | 0.020 |
| Gender | 0.0237825*** | 0.0041623 | 5.71 | 0.000 |
| Livestock | -0.0030269 | 0.0046625 | -0.65 | 0.516 |
| Age | -0.0004259*** | 0.0001226 | -3.48 | 0.001 |
| Cons | 0.1097299*** | 0.0227802 | 4.82 | 0.000 |
| Sigma | 0.1354823 | 0.001442 | | |

*Note - *** implies statistically significant at 1%, ** implies statistically significant at 5%.*

The results of Tobit regression model are presented in Table 6. The t-test statistics showed that at 5 % level, household size, province, gender and age were statistically significant (Table 6). The regression coefficient indicated that as size of household increases MPI will increase. Among the provinces, the t test statistics showed that compared to Western Cape (Wang and Griswold, 2017) there was no difference in the MPI of Northern Cape and Gauteng provinces. However, Western Cape was significantly different from Eastern Cape, Free State, KwaZulu-Natal, North West, Mpumalanga and Limpopo provinces. The tendency of having high MPI poor is highest for KwaZulu-Natal followed by Eastern Cape and North West provinces. Compared to male-headed household, households headed by female are likely to be poorer. As the age of the household head increases, the chances of the household being poor reduces. The likelihood ratio chi-square of 284.74 with degree of freedom of 12 and a p-value of 0.0001 obtained from the Tobit regression model is an indication that the model fits significantly better than an empty model.

## 7. Conclusion

Analysis of multidimensional poverty in rural South Africa presents a robust approach for designing some marginal reforms for addressing multiple welfare deprivations. This study had highlighted the basic welfare attributes deprived by rural residents in rural South Africa. The findings have shown spatial differences in multidimensional poverty in rural South Africa. Therefore, there is the need for marginal reforms targeting poverty alleviation in rural South Africa with keen focus on most deprived provinces like KwaZulu-Natal and Mpumalanga. There is also the need for understanding the dynamics of maternal fertility and its influence on multidimensional poverty in rural South Africa. Adequate programmes to regulate household size to the number that match available resources should be designed. This could be in the form of intensified child birth control that focuses on availability of clinical interventions and proper media programmes in rural South Africa.

Finally, multidimensional poverty affects younger household heads in rural South Africa. This calls for interventions that are targeted at rural youths or those youths who may be assuming the role of house heads due to the demise of their parents.

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