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The Influence of Educational Level on Sources of Income and Household Food Security in Alice, Eastern Cape, South Africa

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ABSTRACT Poverty and hunger eradication are the two crucial targets of the Millennium Development Goals (MDGs), especially for rural people to achieve household food security. The study sought to investigate the influence of level of education on income sources and its effect on rural household food security in Alice, Eastern Cape, South Africa. The population comprised 12,000 people and a sample size of 441 participants was drawn. Cluster sampling was used to select respondents where the population was divided into mutually exclusive groups and systematic random sampling was then employed within each cluster and the Household Hunger Scale was constructed and used to determine how different households sustain their families with income disposition and educational attainment. The findings revealed that level of education plays a vital role in enhancing household income source and food security. The paper recommended effective measures for the government and policymakers, which they can employ in designing policies and strategies to improve household income source through improved quality of rural education to reduce poverty and food insecurity.

INTRODUCTION

Africa still remains overwhelmed by food insecurity after fifteen years into the Millennium Development Goals (MDGs), because the challenges of food insecurity have still not been conquered (FAO 2014). "Food insecurity and poor nutrition have been found to be prevalent and prominent amongst the rural poor" (Tounkar and Omotor 2010). These terms, food security and insecurity can be used to describe whether or not a household can access sufficient quality and quantity of food (Aidoo et al. 2013). The attainment of household food security is widely recognized as a crucial milestone in improving the living standards of the rural poor (Abdu-Raheem and Worth 2011). Currently, South Africa has the second largest economy in Africa and can boast of sufficient food supply at the national level, but the same cannot be said at the household level (Shisana et al. 2014).

A recent statistics revealed that 45.6 percent of South Africans are food secure, 28.3 percent are at risk of hunger, while twenty-six percent are food insecure (Shisana et al. 2014). Therefore, food insecurity poses a serious threat to development in South Africa and has become the focus of many provincial development programs and initiatives (Battersby 2011). This means that the food security situation in South Africa needs serious and urgent attention amidst excessively high unemployment, high inequality and depressed economic growth (Hendriks 2013). Building on the initiatives of food security that exist already, the South African government reprioritized food security in line with its Millennium Development Goals (MDGs) within the framework of National Development Plan of South Africa (State of Nation Address 2010). Clearly, food insecurity in South Africa is not viewed as failure to produce abundant food nationally but a failure to provide adequate purchasing power at the household level (Manyamba et al. 2012).

The high rate of food insecurity is caused by many factors such as the uncertainty of climate, the poor agricultural production, inadequate infrastructure and poor governance (Mwaniki 2006; Rosegrant 2005). Food insecurity is further aggravated by high incidences of rural poverty, which translates at the household level into low purchasing power, lack of access to food by vulnerable groups, rampant malnutrition and poor access to health facilities (World Bank 2009).

Moreover, households that are food insecure experience weak livelihood base and risky coping strategies. It is clear that these households spend up to seventy-two percent of their income in purchasing food (WHO 2013). Lack of education is singled out as one of the major challenges faced by developing countries in achiev-

ing food security (UNESCO 2005) and to a large degree, the high level of income inequality and food insecurity in South Africa have their roots in differential access to wage earning opportunity, which in turn are influenced by lack of education, among other factors (Louw et al. 2001).

A recent report by Statistics South Africa (Stats SA 2014) states that the relationship between level of education and poverty appears strong, and the lower the level of education attained, the more likely adults were to be poor and experience more intense levels of income poverty. Conversely, income as pertaining to household food security is very pertinent, as households with low income resources will find it difficult to access safe and sufficient foods for a healthy living (Beauc et al. 2009). However, the major challenge relating to household food security is identified as food accessibility because access to food is determined by demand and purchasing power, which are hampered by lack of education (Bonti-Ankomah 2001).

The high rate of food insecurity in the Eastern Cape could be attributed to low skills levels in the province, with 10.5 percent of those older than 20 years having never received any education (Statistics South Africa 2012). As revealed by Westaway (2012), poor education levels are the leading cause of the widespread unemployment in Eastern Cape Province, which then contribute to food insecurity since unemployed individuals lack the purchasing power to afford sufficient, safe and nutritious food. It is against this background that the paper sought to investigate whether level of education attained would improve the income sources of the rural households in Alice and on food security.

Objectives

The aim of this paper is to determine whether level of education attained would improve the income sources of the rural households and its effect on food security of rural households in Alice, Eastern Cape a predominantly rural and historically disadvantaged area in South Africa. The other objectives of this paper involve investigating whether the level of education improves income source, determines income whether income source promotes food security, and also to investigate whether level of education attained improves food security among low-income households in Alice.

Hypotheses

The several hypotheses were formulated in this paper, which indicates that the level of education is not related to income source, and that income source is not related to food security and level of education is not related to food security. These hypotheses are presented here, in this form.

H01: Level of education is not related to income source.

H02: Income is not related to food security.

H03: Level of education is not related to food security.

Literature Review

Concept of Food Security

Generally, a household is considered food insecure if it has limited physical and economic access to secure considerable quantities of nutritionally adequate and safe food in socially acceptable ways in order to sustain an active and healthy living (Osei et al. 2010). Food security as described by Food and Agricultural Organization can only be achieved when all members of a household consume nutritionally adequate food to meet their individual dietary needs on a continual basis (FAO 1996). "Food security is also defined as a situation when all people, at all times have physical, social and economic access to sufficient, safe and nutritious food, which meets their dietary needs and food preferences for an active and healthy life" (FAO 2008).

The famous World Food Summit of 1996 identified three dimensions of food security to include food availability, accessibility and utilization (FAO 1996). Food stability was later added to these dimensions as the fourth food security dimension (FAO 2008). Food availability refers to the availability of sufficient quantities of food, which is of appropriate quality, supplied through domestic production or imports, including food aid (FAO 1996). Food accessibility refers to the capability of individuals and households to obtain food and address the issues of purchasing power and consumption behavior (FAO 1996). Food utilization refers to the biological availability of nutrients for use by the human body (FAO 2006).

Labadarios et al. (2009) posited that food insecurity takes place at four different levels—

national level, regional level, community level and household level. However, South Africa is perceived to be food secure at the national level but that does not largely exist at the household level (Ladzani 2009). Food security at the community level is seen as a situation whereby the members of the community can obtain enough, safe, culturally acceptable and nutritionally adequate diet through sustainable food system that maximizes self-reliance in the community as well as social justice (Labadarios et al. 2009). While food security at the household level takes place when there is availability and accessibility of food to households (Labadarious et al. 2009).

On the other hand, Nieuwenhuis et al. (2007) described education as an essential social process, which has the potential to shape the future of a society. Education is further described by Tilak (2002) as the process that produces a labor force that is more skilled, more adaptable to the needs of a changing economy, and more likely to develop the creative ideas, techniques, and products, which are critical to the processes of economic expansion and social adaptation to change. Collins Dictionary (2014) defined income source as a venture that provides regular supply of money such as employment, investment, trading, grants and pension.

Empirical Literature

Various studies conducted in a bid to measure food security in different countries have showed a close relationship between food security educational level and income source. For example, the study conducted in Tanzania showed that lower levels of educational attainment are directly linked with high food insecurity (Knueppel et al. 2009). A similar study conducted in the City of Johannesburg also revealed that a strong relationship exists between employment, income and food security (Rudolph et al. 2012). The study's conclusion is that members of the households who have full-time employment tend to be more food secured than those with part-time jobs.

Brown and Park (2002) contended that it is evident that low level of education leads to income poverty and insufficient resources, which contributes to the lack of purchasing power of some rural households in accessing safe, sufficient and nutritious food for active and healthy living. Weber et al. (2007), using data collected from the US panel study of income dynamics associated higher education of the households with the probability of a household to afford safe, sufficient, and foods filled with nutritional balance to enjoy active and healthy living.

Sen (1999) described level of education as highly imperative in promoting agency. "Agency' implies an individual's ability and capacity to strive and realize goals he or she values. But in the context of this study, it is the ability of rural households to escape from poverty and hunger with their own means. Also, Alkire (2005) posited that an individual with higher level of education possesses the better chance to find a decent job that will afford him or her good salary or wage to afford adequate, safe and nutritious foods thereby reducing the threat of food insecurity. The State of Food Insecurity Report (FAO 2005) highlighted the strong relationship between food insecurity and illiteracy or lack of education. The report stated that the data collected from rural areas in 22 low-income countries showed how a high level of undernourishment used as a proxy of food insecurity is correlated with a low level of education.

Sen (1997) argued that the human capital approach views education as relevant because it increases personal earnings, productivity and economic growth both at the national and community levels. Okurut et al. (2002), while analyzing poverty in some households in rural Uganda, discovered that the higher the educational level of the household heads the wealthier the households. This could result in households having the purchasing power to achieve food security. The study conducted by Smith (2007) in determining what contributes to household income found that human capital and demographic factors were the main determinants of income, that well-educated middle-aged and self-employed individuals had relatively comfortable incomes, which allowed them to acquire safe, dietary and nutritious foods, making their households food-secure.

Najafi (2003) argued that education is an important factor, which is thought to influence household food security status. It is viewed as an essential social process that has the potential to transform the future of the society. Study conducted by Verner (2006) on the low income households living in rural areas, discovered that low level of education was among the main caus-

es of poverty in rural households leading to hunger and food insecurity and this constrains income, since individuals with low educational attainment cannot secure well-paid jobs, which make them susceptible to food insecurity. Mukudi (2003) suggests that education plays a crucial role in accessing public information, particularly in the area of health, nutrition, hygiene and acquiring knowledge on how to avoid and face illnesses. It is also suggested that improvements in the level of educational attainment among household members is seen as an important means of reducing poverty and inequality in the society, especially in the rural areas and achieving food security (Aslam et al. 2008).

Drewowski (2010) posited that households with limited resources to purchase enough good food often try to stretch their food budgets by purchasing cheap, energy-dense foods that are filling in order to stave off hunger. Larson et al. (2006) argued that food deprivation and overeating is evident among low income households, those who eat less or skip meals to stretch food budgets may overeat when food is available resulting in chronic ups and downs of food intake that can contribute to weight gain (Andreyev et al. 2008). According to Zenk et al. (2006), households with low income have fewer physical activity resources than higher income households including fewer parks, green spaces, bike paths and recreational facilities making it difficult to lead physically active lifestyles.

Mohammed and Omotesho (2004) suggested that the effective management of available resources through farming household provides as much income as possible from its production and consequently improves its economic access to food required by its members. Rush and Rusk (2009) agreed with the study conducted about people who suffer food insecurity across different countries and health systems, have consistently found that it is associated with limited household resources, low disposable income and low socio-economic status. In addition, Lallukka et al. (2007) maintained that achieving food security follows a socio-economic gradient through level of education, income and other socio-economic determinants, and that education and income assume common ranking in modern society.

Aliber (2009) argued that a decline on the part of government in not committing adequate resources for the improvement of rural education, which paves way for the improvement in agricultural production and nutritional education will make the rural households susceptible to food insecurity. Bortha (2010) observed that despite the large resource allocation towards education, and funds committed in halving hunger, poverty and food insecurity in the rural areas, the outcomes still have not improved. It then raises questions concerning the lack of association between resource allocation and policy implementation.

MATERIAL AND METHODS

A descriptive research design was adopted in this paper. The population of this study comprised individuals from different households in Alice, Nkonkobe District Municipality, Eastern Cape, which comprises 3,705 households with approximately 12,000 people (ASPIRE 2011). Cluster sampling was used, where households were divided into mutually exclusive clusters, and random sampling was employed within the clusters. The sampling frame was an aerial map depicting each household, divided into grids (clusters). In order to achieve a ninety-five percent confidence level, a sample of 374 households was needed and a usable sample of 441 was drawn. A structured questionnaire was used to gather relevant data from the respondents, and this questionnaire was developed from the combination of Household Hunger Scale, which is used to assign households along a scale of severity of food access from no hunger to severe household hunger (Ballard et al. 2010). Before use, the questionnaire was distributed to experts for validity. To test for reliability, the paper used the internal consistency technique by employing Cronbach Coefficient Alpha test for testing the research tool.

Data Collection Method

Trained fieldworkers collected the data using a structured questionnaire as the satisfactory instrument to fulfill the study purpose, which permitted the collection of a large amount of data. The fieldworkers interviewed respondents and administered the questionnaire following a structured pattern to control response bias and increase the reliability of the data. The questionnaire administration and interviews were conducted in Alice.

Data Capturing and Analysis

Data was coded and captured, and both descriptive and inferential statistical analyses were used for this paper. Descriptive statistics were used on the demographic information. The data was imported into SPSS in order for statistical analysis to take place. When the data was imported into SPSS, and chi-square tests were conducted to discover if there was an association between level of education and sources of income as well as between level of education and food security. Cramer's V was used to test the magnitude of the association where p-values were significant.

RESULTS

In this section, the key findings of this paper such as the demographic information of the sample are presented. Subsequently the main findings and results relating to the hypothesis of this paper are also presented.

Demographic Profile of the Sample

As presented in Table 1, a large proportion of the respondents who participated in this research comprised individuals who speak the Xhosa language, which is 89.3 percent of the overall respondents. This is followed by respondents who speak Afrikaans as their indigenous language with a percentage of 7.1, while the remainder of the respondents who were neither Xhosa nor Afrikaans speaking individuals comprised of 3.6 percent of the overall respondents.

Table 1: Biographical information in percentages

	n	*%*	*Cum %*
Language			
Xhosa	393	89.32	89.32
Afrikaans	31	7.05	96.36
Other	16	3.64	100.00
Total	440	100.00	
Age			
<18	6	1.41	1.41
18-29	66	15.49	16.90
30-39	73	17.14	34.04
40-49	107	25.12	59.15
50-59	82	19.25	78.40
>60	92	21.60	100.00
Total	426	100.00	
Gender			
Male	141	34.22	34.22
Female	271	65.78	100.00
Total	412	100.00	

The age bracket of the greater proportion of the respondents who participated in this research ranged between 40 to 49 years of age with a percentage of 25.1 percent. This was followed by respondents whose ages were greater than 60 years. The age bracket of the respondents whom were between 50 to 59 years of age was 19.3 percent, while the respondents within the ages of 30 to 39 years were 17.1 percent. Also, the respondents in this research whose ages ranged between 18 to 29 years of age comprised of 15.5 percent. The respondents with the least age were those whose age bracket was less than 18 years comprised of 1.4 percent of the respondents. It was discovered in this research that there were more female respondents than their male counterparts with the female comprising of 65.8 percent while the male respondents comprised of 34.2 percent. This is in tandem with the demographic profile of the Eastern Cape, where there are more women than men (StatsSA 2012).

The result in Table 2 illustrates that a substantial percentage of the respondents did not complete their secondary school education, which comprised thirty-seven percent of the overall respondents. This is followed by respondents who had primary school education with a percentage of twenty-seven percent. It is discovered that eighteen percent of the respondents did not have matriculation certificate while fourteen percent of the respondents only, had degrees or diploma. The remaining four percent of the respondents possess postgraduate degree.

Table 2: Level of education

Level of education	*n*	*%*
Primary	119	27
Secondary	165	37
Certificate	77	18
Degree/Diploma	62	14
Post graduate	18	4
Total	440	100

The result in Table 3 depicts the income per month of people who participated in the survey, and the result shows that sixty-two percent were receiving less than R1,500 monthly. It was discovered that twenty-two percent of the respondents received an amount between R1,501 and R4,528, while eight percent of the respondents were found to be earning an income between

R4,529 and R12,644. Income earners between R12,645 and R30,327, which consist of two percent of the respondents, were outnumbered by those receiving between R30,328 and R52,593, which comprised four percent of the respondents. Just 0.3 percent of the sample was receiving an income of between R52,594 and R71,992. Another mere 1.6 percent of the respondents were found to be receiving above R71,992.

Table 3: Income per month

Income per month	*n*	*%*
<R1500.00	272	62
R1501.00-R4528.00	96	22
R4529.00-R12644.00	34	8
R12645.00-R30327.00	11	2
R30328.00-R52593.00	20	4
R52594.00-R71992.00	1	0
>71992.00	7	2
Total	440	100

The result from Table 4 illustrates that a large percentage of thirty-eight percent of the respondents relied on social grants as their main source of income while thirty-three percent of the respondents relied on social grants as their major source of income, which the researcher thinks that makes them vulnerable to food insecurity. It was also discovered that eleven percent of the respondents depend on pension as their main source of their income, a meager one percent of the respondents relied on investments as their source of income while five percent relied on remittances. The remainder of the respondents relied on other sources apart from the ones mentioned here as their source of income. The researcher thinks that these sources of income of the respondents are not buoyant enough to ensure food security due to their level of education attained.

Table 4: Income source

Income source	*n*	*%*
Wage	166	38
Grants	145	33
Pension	48	11
Investments	3	1
Remittances	23	5
Other	56	12
Total	440	100

The result in Table 5 indicates that there is a large practical relationship between the level of education and income source of the households (χ^2 (4) = 138.32, *P*< .001, V= 0.13). Since *P- value* is less than 0.05, the null hypothesis is rejected. Therefore, the level of education is related to income source. This is supported by Verner (2006) who argued and identified that a low level of education among the main causes of poverty in rural households leading to hunger and food insecurity and this constrains income, since individuals with low educational attainment cannot secure well-paid jobs, which make them susceptible to food insecurity. Okurut et al. (2002) lent credence to this, when they opined that the higher the educational level of the household heads the wealthier the households. This could result in households having the purchasing power to achieve food security.

The result in Table 6 indicates that there is a large practical relationship between income source and household food security (χ^2 (4)

Table 5: Chi-square test of independence: Relationship between level of education and income source

Income source		*Level of education*					
		Primary	*Secondary*	*Certificate*	*Degree*	*Post graduate*	*Total*
Wage	Freq	22	62	31	38	13	166
	%	19	37.6	39.7	61.3	68.4	37.7
Grant	Freq	62	72	6	5	0	145
	%	53.4	43.6	7.7	8.1	0	33
Pension	Freq	21	13	6	4	4	48
	%	18.1	7.9	7.7	6.5	21.1	10.9
	%	0	1.2	1.3	0	0	0.7
Remittance	Freq	4	4	8	7	0	23
	%	3.4	2.4	10.3	11.3	0	5.2
Others	Freq	7	12	26	8	2	55
	%	6	7.3	33.3	12.9	10.5	12.5
Total	Freq	116	165	78	62	19	440
	%	100	100	100	100	100	100

Table 6: Chi-square test of independence: Relationship between income source and food security

Income source		*Food security*			
		Secure	*Moderate*	*Insecure*	*Total*
Wage	Freq	134	23	12	169
	%	30.4%	5.2%	2.7%	38.3%
Grant	Freq	77	36	32	145
	%	17.5%	8.2%	7.3%	32.9%
Pension	Freq	34	9	2	45
	%	7.7%	2.0%	0.5%	10.2%
Investment	Freq	3	0	0	3
	%	0.7%	0.0%	0.0%	0.7%
Remittances	Freq	19	2	2	23
	%	4.3%	0.5%	0.5%	5.2%
Others	Freq	49	3	4	56
	%	11.1%	0.7%	0.9%	12.7%
Total	Freq	316	73	52	441
	%	71.7%	16.6%	11.8%	100.0%

=43.688a, P< .001, V= 0.35). Since P- value is less than 0.05, the null hypothesis is rejected. This means that income source is related to household food security. The researcher thinks that that any household with sufficient and abundant income source has the ability, capacity and above all the purchasing power to afford safe and nutritious food and at the same time establish food gardens and have unlimited food choices, which would subsequently lead to food security. This is buttressed by Weber et al. (2007) who associated higher education of the households with higher income and with the probability of a household to afford safe, sufficient, and foods filled with nutritional balance to enjoy active and healthy living.

The results in Table 6 indicate that there is a large practical relationship between level of education and household food security (χ^2 (4) =, P< .00184.010, V=2.30). Since *P- value* is less than 0.05, the null hypothesis is rejected in favor of the alternate hypothesis. This implies that the level of education is related to household food security. This result is supported by Bonal (2007) who posited that education is an important means of fighting poverty and household food insecurity. This assertion is buttressed by Schiller (2008) who argued that a higher level of education enables a broader scope of employment possibilities and opportunities of earning higher income to be able to afford a safe and nutritious food. This is also strengthened by Weber et al. (2007) who also reported that higher education level of the households is associated with lower probability of a household being unable to afford safe and nutritious food. Musemwa et al. (2013) suggested that educating rural households using informal methods could also help ensure alternatives to promote food security.

DISCUSSION

This paper focused on the influence of level of education on income and its effect on food security. The main aim of this study is to inves-

Table 7: Chi-square test of independence: Relationship between level of education and Food security

Level of education		*Food security*			
		Secure	*Moderate*	*Insecure*	*Total*
Primary	Freq	57	28	29	114
	%	13.0%	6.4%	6.6%	26.0%
Secondary	Freq	104	39	23	166
	%	23.7%	8.9%	5.3%	37.9%
Certificate	Freq	75	2	0	77
	%	17.1%	0.5%	0.0%	17.6%
Degree	Freq	58	3	1	62
	%	13.2%	0.7%	0.2%	14.2%
Postgraduate	Freq	19	0	0	19
	%	4.3%	0.0%	0.0%	4.3%

tigate whether the level of education attained would improve the income sources of the rural households and its effects on food security among the rural households in Alice, Eastern Cape a predominantly rural and historically disadvantaged area in South Africa.

The objectives of this study have been achieved considering the findings of the research hypotheses. The first result hypothesis indicates that there is a large practical relationship between the level of education and income source of the households (χ^2 (4) = 138.32, *P*< .001, V= 0.13) forcing the null hypothesis to be rejected. This means that the first objective of this paper was achieved. The second objective of this study was achieved as regards to the result hypothesis, which showed that that there is a large practical relationship between income source and household food security (χ^2 (4) =43.688a, P< .001, V= 0.35), which made the researcher reject the null hypothesis. The last objective of this paper was also achieved because the hypothesis result showed that there is a large practical relationship between level of education and household food security (χ^2(4) =, P< .00184.010, V=2.30). This Compelled the researcher to reject the null hypothesis in favor of the alternate hypothesis.

The outcome of this paper is supported by Knueppel et al. (2009) who argued that a high level education is directly linked with high food security. In the same vein, Rudolph et al. (2012) revealed that there is a strong relationship that exists between employment, income and food security. Labadarios et al. (2009) revealed that the level of education is related to food access through its effects on employment. This link between education and food insecurity is buttressed by research conducted in Hamburg, Eastern Cape by Ndhleve et al. (2012), who found that households with inadequate access to food were less educated and earned low incomes. This points to the fact that the level of education determines the level of household, which in the long run can be linked to food security.

CONCLUSION

This paper explored the relationship between the level of education on income sources of rural households and its effects on the household food security in Alice, the Eastern Cape South Africa. A sample of 441 was drawn and a structured questionnaire was used to collect relevant data from the respondents. The paper found that the level of education plays a crucial role in raising the income status of rural households and also in achieving food security. Based on the findings discussed previously, all the null hypotheses were rejected and can be concluded that there is a large practical relationship between the level of education and the sources of income of the household as well as level of education and food security. Therefore, the research objectives were achieved.

RECOMMENDATIONS

As a recommendation, the rural household food security needs improvement through means of sustainable measures and successful policy implementation. Benefits and social grants may not be a sustainable household income since grants is nothing but a short-term solution to food insecurity therefore alternative measures, such as government investment in rural education. It recommends that educating rural households using informal methods could also help ensure alternatives to promote food security, and also is of paramount importance and should be included and prioritized. The government should implement the effective management of available resources through farming, and households get as much income as possible from its production, and consequently improve its economic access to food required by its members. The government should make education affordable for rural households.

LIMITATIONS

The desire for social desirability may have caused some respondents to be dishonest with their responses in an attempt to impress the researcher with their answers. The respondents may have had valuable information to share, but the use of structured questionnaires limited their responses. Non-response by some of the respondents was another limitation encountered. Some of the household members were not at home when the field workers visited, and this resulted in delays in completing the research within record time.

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