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Associations between Poverty and Socio-economic Variables in a Typical Tswana Rural Village: New Insights

ABSTRACT

This paper reports on and analyzes primary survey data obtained from a survey of household heads on the rural village of Nshakazhogwe, a typical rural village in northeast Botswana. It examines the associations between the incidence of poverty of household heads in this village and the values of several socio-economic variables. The socio-economic variables considered are the age of the household head, the level of their educational attainment, their gender, the number of sources from which they obtain their income, whether or not they have some wage employment, whether they receive income transfers privately or from the government, whether they conduct a home business and whether or not they obtain income from sales of livestock, crops or natural resources. Some associations are found to be statistically insignificant but not all. The data enables a life cycle of the likely incidence of poverty of household heads to be derived. Some of our results differ from those suggested by the relevant literature. For example, the gender of the household head is not associated significantly with the incidence of poverty, neither is involvement or otherwise in wage employment, and a positive (but statistically insignificant) association is found to exist between the level of educational attainment and the incidence of poverty. Reasons for these and the other observed relationships are outlined. Further data gathering and analysis would be desirable to substantiate the hypotheses that emerge from this paper.

Associations between Poverty and Socio-economic Variables in a Typical Tswana Rural Village: New Insights

1. Introduction

The incidence of poverty in rural Botswana is a major concern and latest reports suggest it is on the rise while it is declining for urban areas (Central Statistics Office Botswana 2004; Tumelo 2004). There is limited information about factors associated with the incidence of rural poverty in Tswana villages, and in this article we aim to identify significant socio-economic variables that are associated with the occurrence of poverty in a typical Tswana village. Available empirical data for these variables from our case study are mostly (but not entirely) qualitative. Because qualitative data are categorical observations, they have no numerical (quantitative) meaning because no arithmetic calculations, such as the mean, are permissible (Selvanathan et al. 2000).

The socio-economic variables related to the incidence of poverty in the selected village in Botswana, Nshakazhagwe, are the following attributes associated with the household heads in this village: (1) their age, (2) level of education, (3) gender, (4) the number of sources of income of the household head, (5) whether the household head is engaged in wage employment, (6) whether the household head receives private or government income transfers, (7) whether or not heads are involved in conducting a home business, and (8) whether or not they obtain income from sales of livestock, crops or natural resources.

The results are based on a survey conducted in Nshakazhogwe village of all households in 2005 by the first listed author. The article begins with an outline of the survey procedure adopted and a discussion of methods used to organize the data. These are followed by cross-tabulations of the various socio-economic variables of the heads of household and the incidence of poverty. In addition, Pearson Chi-square tests are conducted to determine the statistical difference of the socio-economic variables of heads of household and the occurrence of poverty in the village. It should be noted that the analysis is cross sectional and considers the influence of each of the

selected socio-economic variables independently. The analyses of associations are, therefore, of a partial nature.

2. Survey Procedure and Method of Analysis used for the Case Study

2.1 Description and Choice of Case Study

Nshakazhogwe village in the northeast region of Botswana was chosen from a selected cluster of 8 villages in the region with a population range of 1000 to 2000. Nshakazhogwe's population of 1700 falls in this range (Central Statistics Office Botswana 2001). The national average age of the household head in rural areas is 49.1 years (Central Statistics Office Botswana 2004) and in Nshakazhogwe the average age of the household head of 56 years. Although this statistic is somewhat higher than the national average, it is close. In Nshakazhogwe, the proportion of heads of household with primary education or less is 80 percent which is comparable to 83 percent of the heads of household in rural areas having primary education or less (Central Statistics Office Botswana 2004). These characteristics suggest that this village is typical of a rural Tswana village.

Most Tswana villages are located next to rivers which are commonly used by poor households to water livestock. Nshakazhogwe is next to Shashe River and its economy relies on the river system for both human and livestock watering. Crop production and natural resource harvesting form part of the traditional village livelihood systems in the rural areas of Botswana (BIDPA 2001; Watson and Dlamini 1999). Nshakazhogwe was purposively chosen as a case study because it had a population that was large enough for statistical validity of the results.

2.2 Timing of Study, Sample Selection and Data Collection

The case study survey was undertaken from September to November 2005. This period is favourable for study interviews in rural Tswana villages because it is just after harvest time and before the annual seasonal rainfall. Therefore, most heads of households were available for interviews. Personal interviews were conducted as the most appropriate method of data collection because household lists were inadequate. Therefore, mail questionnaires in the area were not practical. One typical cluster as a case study was used because the geographical area of interest covered, more than

150km by 90km area, is wide and the limited funds and time for this research allowed this choice only.

A village map, also used by the Central Statistics Office of Botswana, which divides the village into six enumeration areas was used to guide household interviews for this study. The household was the sampling unit. The head of household was the main person interviewed. All households in one enumeration area were contacted before commencing interviews in the next enumeration area. A total of 330 households were contacted and interviewed out of 366 eligible households in the village. It was found that 34 houses were vacant and their owners could not be interviewed, and 1 questionnaire had missing information. There were 29 institutional housing units at a secondary school and 10 institutional housing units at the local primary school that were not contacted and interviewed. Households in institutional houses were not included as is the norm in most household interviews in developing countries (Deaton 1997).

2.3 Limitations of the Interview Method

The interview method is very costly. As a result, the budget considerations enabled the selection of only one village which might raise questions about its representativeness. However, given that all the Tswana villages have similar language, population sizes ranging between 1200 and 1900, similar infrastructure background, the same resource base and climate, the selection of one village can be considered adequately representative. Except, for villages in western Botswana, all the characteristics of the selected village are similar to all the rural villages of Botswana making it a typical Tswana rural village.

2.4 Data Collection and Reliability

The study used four research assistants, with previous experience in 2004 Agricultural Census project of the Central Statistics Office. They were between 21 to 25 years of age. Two were females and two were males. Two research assistants came from the area and this reduced the language barrier problems. The inclusion of locals in the research team increased the participation rate, and the reliability and validity of information received. The first listed author was the principal researcher and translated the questionnaire into Setswana, the national language, which was used for

asking questions in the field. Enumerators translated and recorded answers in English. The principal researcher trained and supervised the enumerators and was present in the village throughout the survey period and also carried out household interviews. In addition, the principal researcher accompanied each enumerator at the beginning of the survey to ensure that questions were correctly asked and understood. Any queries and clarifications were answered as they arose in the field.

2.5 Research Permit, Ethical Standards and Non-response

A research permit was secured from the Ministry of Finance and Development Planning, Botswana which facilitated research team introductions in the study village. Interviewers assured respondents of the anonymity (confidentiality) of their answers and interviewers also asked for the consent of the respondent to the interview, which had to be confirmed by a signature of the respondent on the consent form provided by the enumerator. Prior to the full scale study, a 3 day pilot study was carried out in Makaleng village in the North East administrative district. Feedback from the pilot study helped to improve questionnaire design and indicated that the subject of the questionnaire was attractive to respondents. The problem of non-response was small because of an attractive and easy to understand questionnaire, the timing of the study before the rainy season, the use of experienced enumerators, paying visits to respondents 7 days of the week, including weekends and the role of various relevant gatekeepers.

2.6 Coding, Data Entry and Storage

A coding sheet was developed according to each section of the questionnaire providing both a code for the answer and a label and coding was completed in the field. Where the answer was not stated, a Code 9 or 99 was assigned.

2.7 Interpreting the Implications of the Data Obtained and Analysis

The interpretation of the households interview results in Nshakazhogwe village are considered to be a random cluster sample of a larger population; namely all households in rural Botswana. This interpretation enables theories of statistical inference to apply because one is using the whole village as a sample of all villages in rural Botswana. Data entry and storage were done in the field immediately after

coding, using a Census and Survey Processing System (CSPro) software package and an SPSS software was applied for analysis.

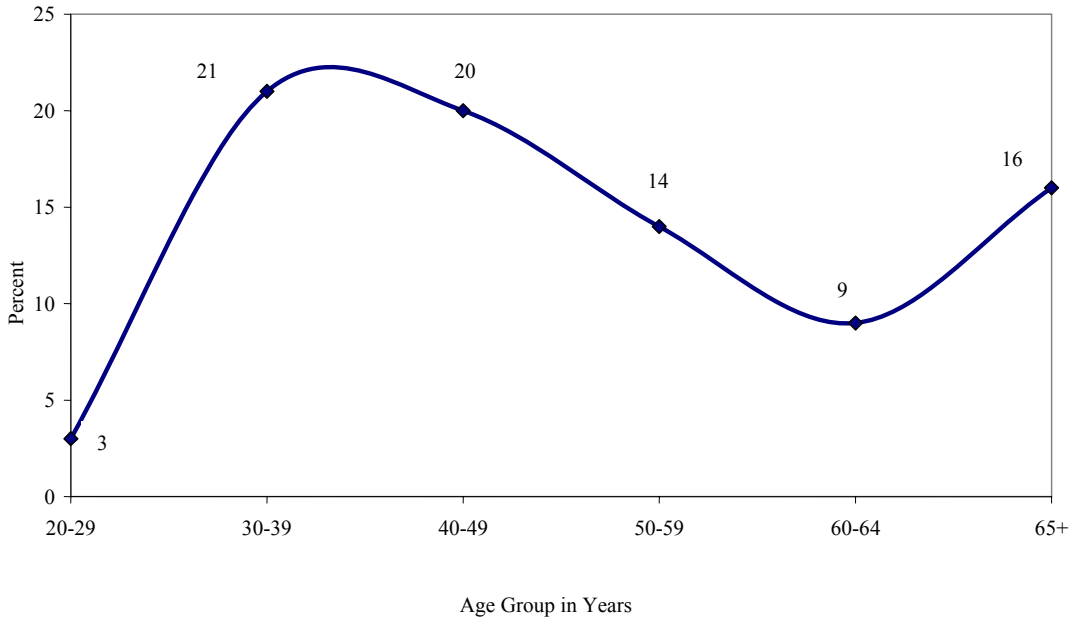
A review of the economic theory and poverty literature suggests that in rural Botswana, the most relevant objective methods to determine the extent of rural poverty are the cost of basic needs (CBN) method, which is also used by the Botswana Central Statistics Office (CSO) to determine the national poverty rate. In this study, a CBN method for determining the poverty rate was applied using all individuals in the study, where equivalence scale method was used. The results of this survey will be summarised by cross tabulating these. A chi-square goodness of fit was chosen to test the significance of an association between the incidence of poverty attributes and socio-economic variables of household heads in rural areas. This test is relevant because the case study sample size of 330 is large and results are reliable because all the expected frequencies were more than five. Given the hypothesis of this paper, a random variable associated with a cross tabulation of n households assuming a selected attribute of household head, in an r by k contingency table has a chi-square distribution with (r-1)(k-1) degrees of freedom. The null hypothesis of no association is rejected for large absolute discrepancies between observed and expected numbers (Newbold 1995).

3. Life-cycle of Poverty: Incidence of Poverty and Age of Household Head

The relationship between the age group of a household head and the incidence of poverty is displayed in Figure 1. Figure 1 shows that the incidence of relative poverty in Nshakazhogwe village rises sharply from less than 3 per cent for those in the age group 20-29 years to 21 per cent for age group 30-39 years and then declines slightly to 20 per cent for those aged 40-49 years. A high incidence of poverty in the latter age groups could be because there are very limited opportunities for employment in the rural villages of Botswana. Even when there are employment opportunities, they are likely to be in traditional agriculture which is not covered by Botswana's minimum wage legislation and usually pays below minimum wages (Ministry of Finance and Development Planning 2002). Household heads in the age group 30-49 years of age usually have a higher number of dependants than those in other groups because they are raising their children. Therefore, requirements of these groups for support of

growing children might explain the high rates of the incidence poverty as they are also faced with poor agricultural prospects and few employment opportunities.

Figure 1 Relative Incidence of Household Poverty by Age Group of Household Head in Nshakazhogwe Village 2004



A further factor that contributes to the high incidence of poverty amongst household heads aged 30-49 years is that they are not normally in receipt of private remittances or state income transfers. Their offspring are mainly too young to migrate and send remittances. Although this also applies to those aged 20-29, they are very likely to have fewer dependants and may obtain work more easily because of their superior physical strength.

As illustrated in Figure 1 the incidence of poverty falls in Nshakazhogwe to 14 per cent for age group 50-59 years and further to 9 percent for 60-64 years age group. This observed decline of the incidence of poverty in Nshakazhogwe as the age of household heads increases, coincides with an increase in the age of their offspring. Most of the children of household heads in this group have completed their school education and many have migrated to non-rural areas where they find jobs. Households that have sent some of their members as out-migrants are more likely to benefit from remittances in the form of income transfers which are likely to increase the income of household heads who remain in rural areas. This reduces those

incidences of poverty. Thus, a reduction in their dependency ratio and a rise in the level of private remittances received by these household heads aged 50-60 years help to explain their comparatively low incidence of poverty compared to other age groups. In addition, many will have had a chance to save and accumulate productive assets and establish social contacts that could add to their income. Furthermore, they are likely to have accumulated a significant amount of knowledge and experience which would be favourable to their economic prospects.

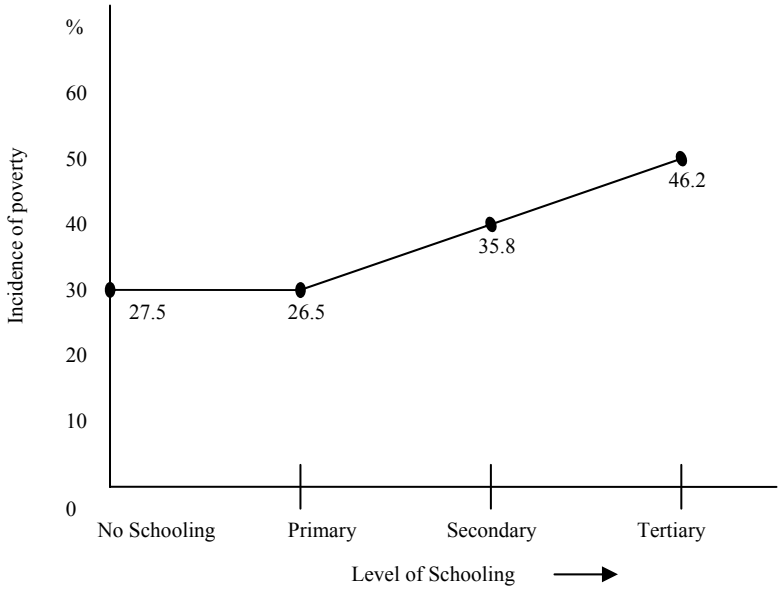
Figure 1 further shows that the relative incidence of poverty rises to 16 per cent for age group 65 years and above. An increase in the incidence of poverty as the household head is aged 65 years and above could indicate that sources of income decline sharply in that age group because the flow of income stops when individuals retire from active employment or they cannot work easily. In addition, in this age group, farming activities become limited because individuals are no longer able to do hard work. Also in this age group widowhood increases. In this village case study, about 70 per cent of heads of household were in widowhood which has negative implications for incoming income as most of these individuals were female. This implies that their husbands, who were likely breadwinners, had died. Although the incidence of poverty among the heads of household in 65 years and above age group is higher than for age groups 50-59 years and 60-65 years, it is much lower than for age groups 30-39 years and 40-49 years. A lower incidence of poverty among the age group of 65 years and above could be a result of the impact of the old age pension scheme in Botswana and the role of private transfers which might not be available for heads of household in younger age groups. But it is likely that private transfers for this age group would have tapered off compared to the 50-64 year old group. This is because their offspring are likely to have increasing need to take care of their own children and are less able to make transfers to parents.

4. Incidence of Poverty and the Educational Status of Household Heads

Rather surprisingly the incidence of poverty in this rural village tends to rise with the level of education of the household head. The relationship is graphed in Figure 2 which is based on Table 1. There is hardly any difference between the incidence of poverty experienced by household heads with no schooling (27.5%) and that experienced by household heads with only primary level schooling. The incidence

rises substantially to 35.*% for those household heads who have completed secondary school education and to 46.2% for those completing tertiary education. Therefore, in this village, a positive relationship appears to exist between the incidence of poverty of household heads and their level of educational attainment. Usually, economists predict the reverse relationship. See for example, Bardhan and Udry (1999) and Schultz (1988).

Figure 2: Relative Incidence of Household Poverty by Educational Status of Household Heads in Nshakazhogwe, 2005



The reasons for this perverse relationship may be several. First, there are few employment or occupational positions in rural villages, such as Nshakazhogwe, that call for other than basic education. For those who remain in the village there may be a low or negative return on education beyond the primary school level. On the other hand, those who migrate from the village to non-rural areas may obtain a positive return on increased education and have a lower risk of being in poverty. It may also be that those how have more education and remain in the village are less enterprising or able than those who leave. Some sorting may occur. Furthermore, there are also other factors influencing the incidence of poverty apart from the level of educational attainment of the household head. For example, most of those with tertiary education in the village are retired and this may increase their susceptibility to poverty. While

the impacts of these other factors require further investigation (compare Stern, 1991) we cannot dismiss the hypotheses that obtaining education beyond primary level is not very effective in reducing the incidence of poverty amongst those who do not migrate from the village or if they migrate, return to it.

Table 1 provides a detailed cross tabulation of the incidence of poverty in the village in relation to the educational attainment of household heads. The Chi-share test reveals that the differences in incidence of poverty of those with no schooling or primary schooling compared to that for household heads with secondary or tertiary education is not statistically significant ($\alpha > 0.10$) . See Table 1.

Table 1: Cross-tabulation of the Poverty Status of Household Heads and their Educational Status, Nshakazhogwe, 2005

Education Status of Household Head		Household Head Poverty Status		Total
		Not Poor	Poor	
No School	Count	50	19	69
	% within Education Status of Household Head	72.5%	27.5%	100.0%
	% within Poverty Status of Head	21.4%	19.8%	20.9%
Primary	Count	143	52	195
	% within Education Status of Household Head	73.3%	26.7%	100.0%
	% within Poverty Status of Head	61.1%	54.2%	59.1%
Secondary	Count	34	19	53
	% within Education Status of Household Head	64.2%	35.8%	100.0%
	% within Poverty Status of Head	14.5%	19.8%	16.1%
Tertiary	Count	7	6	13
	% within Education Status of Household Head	53.8%	46.2%	100.0%
	% within Poverty Status of Head	3.0%	6.3%	3.9%
Total	Count	234	96	330
	% within Education Status of Household Head	70.9%	29.1%	100.0%
	% within Poverty Status of Head	100.0%	100.0%	100.0%
Chi-Square Tests				
	Value	df		Asymp. Sig. (2-sided)
Pearson Chi-Square	3.645(a)	3		.302
N of Valid Cases	330			

a 1 cells (12.5%) have expected count less than 5. The minimum expected count is 3.78.

5. Gender of Household Head and Poverty

Table 2 is a cross tabulation of the incidence of poverty and the gender of the heads of household. The results show that 31.3 per cent of all male heads of household were poor whereas 28 per cent of all female heads of household were poor. The results of a Pearson Chi-square statistical test show that gender is not significantly associated with the incidence of poverty in Nshakazhogwe village (Table 2). In particular, the incidence of poverty is slightly higher in male headed households than in female headed households. This could be because income transfers play a major role in

household income, and female headed households are more likely to receive income transfers than male heads of household.

Table 2: Cross tabulation of Household Poverty Status and Gender of Household head

Gender		Household Head Poverty Status		Total
		Not Poor	Poor	
Male	Count	77	35	112
	% within Gender	68.8%	31.3%	100.0%
	% within Household Head Poverty Status	32.9%	36.5%	33.9%
Female	Count	157	61	218
	% within Gender	72.0%	28.0%	100.0%
	% within Household Head Poverty Status	67.1%	63.5%	66.1%
Total	Count	234	96	330
	% within Gender	70.9%	29.1%	100.0%
	% within Household Head Poverty Status	100.0%	100.0%	100.0%
Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	.383(b)	1	.536	
N of Valid Cases	330			

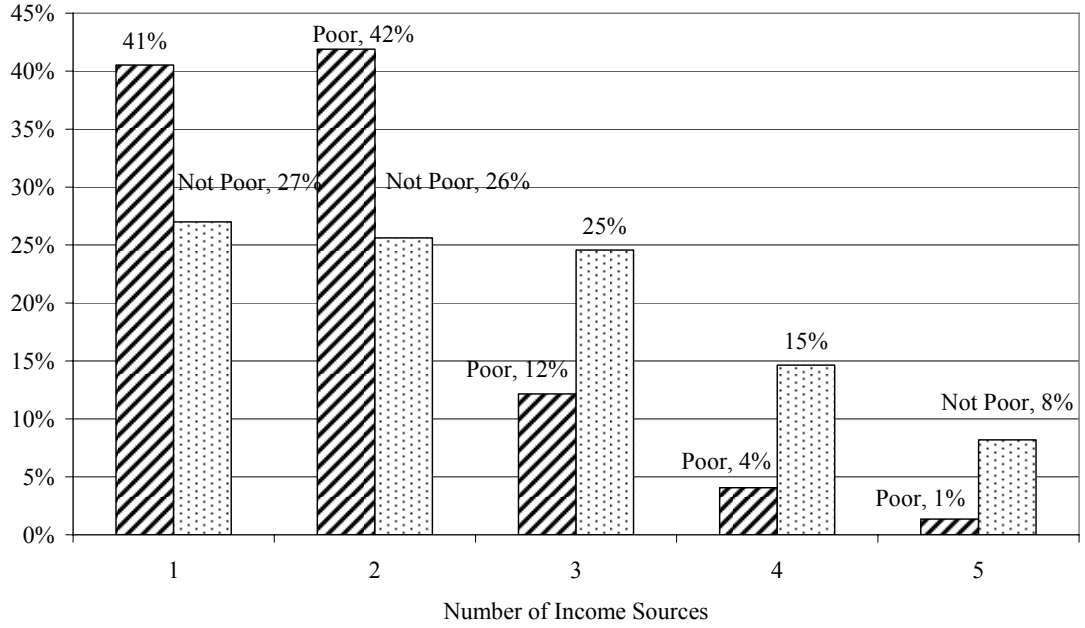
a Computed only for a 2x2 table
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 32.58.

6. Association of Number of Sources of Income of Household Head with the Occurrence of Poverty

Figure 3 shows the distribution of the incidence of poverty among heads of household by the number of income sources that they depend on for their livelihood. Poor heads of household tend to rely more on one source of income (41 per cent) than is the case with the not poor heads of household in this case study village (27 per cent). This characteristic of the rural poor in Botswana is not consistent with empirical observations that poor agrarian households often diversify their activities with the hope that bad fortune in one activity will be compensated by good fortune in another – a livelihood strategy that is a form of self-insurance (Dasgupta 1993). Even though 42 per cent of poor households depend on two sources of income, very few of the poor

household (17 per cent) compared to the not poor households (48 per cent) depend on more than two sources of income.

Figure.2 The Distribution of Poor and Not Poor Households by Poverty Status by Number of Sources of Income



The following Table 3 shows the percentage of the household heads that are poor for each of the number of sources of income. It shows that poor household heads constitute 28 per cent and 42 per cent of households that use one source and two sources of income respectively. Overall, the proportion of households that use one source or two sources of income is 70 percent. This observation supports our earlier observation that income sources for the poor households in Botswana are not widely diversified. Poor heads of household that have 3 or more sources of income constitute 30 per cent of all households.

Table 3 Number of Sources of Income by Percentage of the Poor

No of Income Sources	Total Number of Households	% of Poor Households	Cumulative %
1	92	28	28
2	138	42	70
3	63	19	89
4	33	10	99
5	4	1	100
	330	100	

7. Wage Employment and Poverty

Table 4 is a cross tabulation of the incidence of poverty and the employment status of the heads of household. The results in Table 4 show that 29 per cent of household heads that were not employed were poor and 29.2 per cent of household heads that were employed were also poor. In addition, 44 per cent of heads of household that are not poor compared to 43.8 per cent of heads are poor were not employed. The results of a Person Chi-square statistical test are not significant (Table 4) and show that the there is no association between the incidence of poverty in Nshakazhogwe and the employment status of the head of household. The role of transfers from members of some households as out migrants employed elsewhere and government welfare programmes might play a major role in explaining this result.

Table 4: Cross Tabulation of Household Poverty Status and Employment Status of Household Head

Employment Status of Household Head		Household Head Poverty Status		Total
		Not Poor	Poor	
Not employed	Count	103	42	145
	% within Employment	71.0%	29.0%	100.0%
	% within Household Head Poverty Status	44.0%	43.8%	43.9%
Employed	Count	131	54	185
	% within Employment	70.8%	29.2%	100.0%
	% within Household Head Poverty Status	56.0%	56.3%	56.1%
Total	Count	234	96	330
	% within Employment	70.9%	29.1%	100.0%
	% within Household Head Poverty Status	100.0%	100.0%	100.0%
Chi - square				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	.002(b)	1	.965	
N of Valid Cases	330			

a Computed only for a 2x2 table
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 42.18.

8. Income Transfers and Poverty

Income transfers are an important source of income in rural Botswana (BIDPA 2001). Table 5 displays the results of a cross tabulation of the incidence of poverty and the whether the heads of household receive private transfers. Overall, 53.9 per cent of all households in Nshakazhogwe received private transfers. In particular, these results

show that 53.4 per cent of heads of household that are not poor compared to 55.2 per cent of poor households receive private transfers. These results also indicate that the proportion of heads of household that did not receive private transfers who are poor is 28.3 per cent compared to 29.8 per cent poor heads of household among those that received private transfers. The results of a Pearson Chi-square test are not statistically significant (α>0.10) See Table 5. Therefore there is no association between the relative frequency of private transfers and the incidence of poverty. Given the importance of transfers, this suggests that the incidence of poverty would be much higher if these transfers were not made.

Table 5: Cross Tabulation of Household Poverty Status and the Frequency of Private Transfers to Household Heads in Nshakazhogwe

Private Transfers		Household Head Poverty Status		Total
		Not Poor	Poor	
Did not receive	Count	109	43	152
	% within Private Transfers	71.7%	28.3%	100.0%
	% within Household Head Poverty Status	46.6%	44.8%	46.1%
Received	Count	125	53	178
	% within Private Transfers	70.2%	29.8%	100.0%
	% within Household Head Poverty Status	53.4%	55.2%	53.9%
Total	Count	234	96	330
	% within Private Transfers	70.9%	29.1%	100.0%
	% within Household Head Poverty Status	100.0%	100.0%	100.0%
Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	.088(b)	1	.767	
N of Valid Cases	330			

a Computed only for a 2x2 table
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 44.22.

Table 6 displays the results of a cross tabulation of the incidence of poverty and whether the heads of household receive government transfers. The total proportion of households that receive government transfers in Nshakazhogwe is 45.5 per cent. Specifically, these results show that 47.4 per cent of heads of household that are not poor compared to 40.6 per cent of heads of household that are poor received

government transfers. Almost 41 per cent of poor heads of household received government transfers whereas, around 59 percent of heads of poor household did not. The results of the Pearson Chi-square tests are not statistically significant (Table 6). Whilst the differences in Table 6 are not statistically significant, the poor less frequently received government transfers in this village than the non-poor. This suggests some problems in the target efficiency of the welfare safety net. Therefore, further investigations are required to improve the targeting of government safety nets to ensure that more of those who receive them are poor rather than the not poor. However, just what proportion of those receiving government transfers would be poor or not poor in their absence is not known

Table 6: Cross Tabulation of Household Poverty Status and Government Transfers Received

Govt Transfers		Household Head Poverty Status		Total
		Not Poor	Poor	
Did not receive	Count	123	57	180
	% within Govt Transfers	68.3%	31.7%	100.0%
	% within Household Head Poverty Status	52.6%	59.4%	54.5%
Received	Count	111	39	150
	% within Govt Transfers	74.0%	26.0%	100.0%
	% within Household Head Poverty Status	47.4%	40.6%	45.5%
Total	Count	234	96	330
	% within Govt Transfers	70.9%	29.1%	100.0%
	% within Household Head Poverty Status	100.0%	100.0%	100.0%
Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	1.274(b)	1	.259	
N of Valid Cases	330			

a Computed only for a 2x2 table
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 43.64.

9. Home Businesses and Poverty Incidence

The results of a cross tabulation of the incidence of poverty and whether the heads of household operated a home business are shown in Table 7. These results show that 16.7 per cent of poor heads of household compared to 13.7 per cent of non-poor heads of household operated a home business. The results also indicate that 33.3 per cent of

those heads of household who operated a home business were poor whereas only 28.4 per cent of heads of household who do not operate a home business were poor. The Pearson Chi-square tests are not statistically significant (α>0.10) as shown in Table 7. In this instance, even though the difference between the poor and non poor is not statistically significant, in this village a slightly higher proportion of those operating home business are likely to be poor compared with those that do not. A plausible explanation for this observation is that the poor are likely to have no skills that they can offer to find better paying job opportunities, and therefore are likely to venture into traditional beer home brewing for sale in their homes or operate mini-convenience grocery shops in their homes.

Table 7: Cross tabulation of the Incidence of Household Poverty and whether or not Heads of Households Heads Operate a Home Business

Home business		Household Head Poverty Status		Total
		Not Poor	Poor	
No	Count	202	80	282
	% without Home businesses	71.6%	28.4%	100.0%
	% within Household Head Poverty Status	86.3%	83.3%	85.5%
Yes	Count	32	16	48
	% within Home business	66.7%	33.3%	100.0%
	% within Household Head Poverty Status	13.7%	16.7%	14.5%
Total	Count	234	96	330
	% of all	70.9%	29.1%	100.0%
	% within Household Head Poverty Status	100.0%	100.0%	100.0%
Chi-Square Tests				
	Value	df		Asymp. Sig. (2-sided)
Pearson Chi-Square	.490(b)	1		.484
N of Valid Cases	330			

a Computed only for a 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.96.

10. Agricultural Pursuits (Livestock, Crops and Natural Resources) and Poverty Incidence

In this section, we analyze the association between three dominant traditional agricultural pursuits as sources of livelihood in rural Botswana and the incidence of poverty in Nshakazhogwe. Table 8 displays the results of a cross tabulation of the incidence of poverty and the dependence of heads of household on livestock sales, and the Pearson chi-square test results. These results show that 26.4 per cent of all households in Nshakazhogwe benefited from livestock sales. Of those who had livestock sales, 31.3% were poor. Only 24.2% of those who did not have livestock sales were poor.

Table 8: Cross tabulation of Incidence of Poverty of Household Heads whether or not they had Livestock Sales

Livestock Sales		Household Head Poverty Status		Total
		Not Poor	Poor	
No	Count	177	66	243
	% those without Livestock Sales	72.8%	27.2%	100.0%
	% within Household Head Poverty Status	75.6%	68.8%	73.6%
Yes	Count	57	30	87
	% those with Livestock Sales	65.5%	34.5%	100.0%
	% within Household Head Poverty Status	24.4%	31.3%	26.4%
Total	Count	234	96	330
	% of all	70.9%	29.1%	100.0%
	% within Household Head Poverty Status	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.665(b)	1	.197
N of Valid Cases	330		

a Computed only for a 2x2 table
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 25.31.

A Pearson chi-square test revealed that the differences in these results are not statistically significant ($\alpha>0.10$). Therefore, there was not a statistically significant difference between the percentage of the poor having livestock sales and those without such sales. However, the data do not reveal information about the amount of

income received from livestock sales by individual households. Therefore, more information is required for further comparison of benefits of different households who sell livestock. Thus, it is suggested that future research should seek the actual number of livestock sales and value of livestock sales by individual owners in rural areas. Such data will be useful to measure the extent of income from communal land.

Table 9 provides a cross-tabulation of whether or not household heads had crop sales and the incidence of poverty. The results show that 8.8 per cent of all heads of household in this village had crops sales. The relative proportion of poor heads of household that benefited from crop sales is 10.5 per cent compared to 8.1 per cent of non-poor heads of households. Of all the heads of households that benefited from crop sales, 34.5 per cent were poor. A Pearson Chi-square test shows that these results are not statistically significant (Table 9). Although the difference of the relative proportion of heads of household that benefited from crop sales is not statistically significant, those who sold crops were more frequently poor. Crop production in Botswana results in low returns because of recurring droughts which are associated with a high risk crop failure. In addition, the opportunity cost of migration to modern sector jobs by young able bodied people results in the loss of net income from labour based agricultural production such as crop production. Further research is recommended to consider the per capita benefits from crop sales by income status of a household in rural areas of Botswana.

Table 9: Cross tabulation of Incidence of Poverty and Heads of Household Benefits from Crop Sales

Crop Sales		Household Head Poverty Status		Total
		Not Poor	Poor	
No	Count	215	85	300
	% those without Crop Sales	71.7%	28.3%	100.0%
	% within Household Head Poverty Status	91.9%	89.5%	91.2%
Yes	Count	19	10	29
	% those with Crop Sales	65.5%	34.5%	100.0%
	% within Household Head Poverty Status	8.1%	10.5%	8.8%
Total	Count	234	95	329
	% of All	71.1%	28.9%	100.0%
	% within Household Head Poverty Status	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.487(b)	1	.485
N of Valid Cases	329		

a Computed only for a 2x2 table
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.37.

Table 10 depicts a cross tabulation of the incidence of poverty and whether heads of household benefit from the sale of harvested natural resources. Table 10 shows that 8.2 per cent of all heads of household, in this village case study benefit from the sale of harvested natural resources. The relative proportion of poor heads of household that benefit from the sale of harvested natural resources is 7.3 per cent while it is 8.5 per cent of non-poor heads of household. However, the poor heads of household are 25.9 per cent of all heads of households that benefit from the sale of natural resources. A Pearson Chi-square test results show the differences between poor and non-poor households are not statistically significant ($\alpha>0.10$). However, in practice, the relative involvement of the non-poor in harvesting natural resources is slightly higher than for the poor. Even though, this study did not measure the extent to which each household harvested the natural resources, observations during the case study suggest that the per

capita harvesting of natural resources is higher for not poor households than is the case for poor households. This happens because high income households that harvest natural resources use hired labour to harvest natural resource such as grass cutting for thatch, firewood harvesting and river sand harvesting for sale using movable capital such as tractors and trucks to transport these resources from the communal areas to the market place. Conversely, the poor households used natural resources for subsistence and relied on wheelbarrows for their transport. Therefore, further research might be conducted to determine the extent of natural resource harvesting in relation to the level of income of households. Such research would provide relevant information about natural resource harvesting, environmental problems and the incidence of poverty.

Table 10: Cross tabulation of Household Head Poverty and the Dependence of Heads of Household on Harvested Natural Resources Sales

Sale of Harvested Natural Resource		Household Head Poverty Status		Total
		Not Poor	Poor	
No	Count	214	89	303
	% those without Natural Resource Harvest	70.6%	29.4%	100.0%
	% within Household Head Poverty Status	91.5%	92.7%	91.8%
Yes	Count	20	7	27
	% those with Natural Resource Harvest	74.1%	25.9%	100.0%
	% within Household Head Poverty Status	8.5%	7.3%	8.2%
Total	Count	234	96	330
	% of all	70.9%	29.1%	100.0%
	% within Household Head Poverty Status	100.0%	100.0%	100.0%
Chi-Square Tests				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	.143(b)	1	.706	
N of Valid Cases	330			

a Computed only for a 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.85.

11. Concluding Comments

Although the results of this analysis should be interpreted cautiously, they reveal that for the typical rural village selected for the case study, the incidence of poverty tends to be highest at two stages in the life-cycle of village household heads. It is highest for the age group 30-49 years of age and has another (but lower) peak for those who are 65 years of age or older. Reasons were suggested for the pattern observed but more study is desirable to identify fully the reasons for the high level of poverty amongst village household heads in the 30-49 age group. An 'unusual' association was found between the level of education of household heads and the incidence of their poverty. Contrary to that commonly predicted, the incidence of poverty of household heads tended to rise with their level of education, although the association was not statistically significant. Several factors seem to explain this result. First, there are few opportunities for utilizing other than basic education in rural villagers. While economic gains are likely in non-rural areas from greater education, opportunities for this gain are limited for educated persons who remain in their rural village. Second, the results are to some extent influenced by the age structure of household heads. Further study of the reasons for this possible 'perverse' relationship and for the lack of statistical significance of education as a factor affecting the incidence of poverty is desirable.

There was not a statistically significant difference in the incidence of poverty of female heads of households compared to male heads of households. In fact, the incidence was slightly lower for female head of households than for male heads of households. This contrasts with findings from other countries – usually the evidence of poverty is found to be higher in female headed households than male headed ones. One of the reasons may be that female heads in Tswana rural villages benefit to a greater extent and more frequently from remittances than male heads.

It was also observed that the evidence of poverty in this rural village tends to fall as the number of sources of income of the family head increase. Conversely, the fewer the sources of income, the more likely is the family had to be in poverty. Reasons for this were suggested but further investigation would be worthwhile.

In this rural village, whether or not the household head had wage employment did not significantly affect the incidence of poverty. The reason for this seems to be that a large number of household heads depend on other sources of income such as income transfers, that is private remittance, and government welfare payments. It was found, however, that a substantial number of the poor failed to obtain private remittances or government transfers. The reasons for this need investigation and the magnitudes of the transfers would help to further extend the analyses. Although the analysis indicates that there is no statistically significant relationship between the receipt of income transfers and the incidence of poverty of household heads, this does not mean that these transfers did not reduce the incidence of poverty. This is because the incidence of poverty in this study is measured after the transfers are made. There is little doubt that transfers of income kept the incidence of poverty in this village lower than it would otherwise be in the absence of the transfers. The impact of the transfers on the incidence of poverty in rural villages should be studied further.

Whether or not the household head has a small home business, sold livestock, sold crops or sold natural resources was not significantly associated with the incidence of poverty of household head in the village. However, only a small proportion of the villagers engaged in these rural pursuits.

By considering individual socio-economic variables one at a time, it has been possible to establish associations between some of these and the incidence of poverty of household heads in a typical Tswana rural village. In other cases, no statistically significant relationships were found to exist. However, the occurrence of poverty is often associated with several variables and so relationships involving multiple variables should be considered in further analysis. Nevertheless, this study has managed to highlight relationships that are worthy of further consideration and which in some cases, are at variance with existing findings in the literature. Some of these differences may be due to the particular structure of Botswana's rural community in relation to the general nature of society in Botswana.

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