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COMBATING CHRONIC POVERTY IN UGANDA:

TOWARDS A NEW STRATEGY

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Abstract

Using a panel of 3,572 households in the Northern Uganda Social Action Fund (NUSAF) region interviewed in 2004 and in 2008, the paper provides new evidence on chronic poverty in Uganda. While progress in reducing poverty rates has been impressive from 64.6 percent to 52.2 percent, the levels remain high with a significant number of persistently poor households. Four in every ten households are chronically poor of which 44.9 percent are living in extreme chronic poverty. About 37.8 percent of the households are living in transient poverty of which 67.4 percent escaped poverty during the panel period. The substantial movements out of poverty can perhaps be explained largely by the relative return of peace in the region that enabled households to engage in agricultural activities. While at the aggregate level chronic poverty is significantly more prevalent than transient poverty, a mixed picture is observed at disaggregated level. The picture at aggregate level mirrors itself in the sub-regions of West Nile and Karamoja; but the reverse is observed in Lango sub-region. Chronic poverty is as equally prevalent as transient poverty in Acholi and Teso sub-regions. Overall, chronic poverty is disproportionately high among the Karamajongs. This calls for different kinds of anti-poverty interventions and public support.

The paper further demonstrates that the characteristics and determinants of chronic and transient poverty are not always the same. The chronically poor households suffer from multidimensional deprivation including low incomes, low human capital development, inadequate access to infrastructure (especially input markets, trunk roads etc), and inability to access non-agricultural employment. On the other hand, the findings have demonstrated that ensuring peace in this part of the country is necessary for sustainable poverty reduction.

The key policy messages: first, the on-going anti-poverty interventions such the Peace, Recovery and Development Plan (PRDP) and NUSAF II, among others, need to be refocused and targeted to ensure that the dynamic nature of poverty in this part of the country is taken into account. This will go a long way in improving the effectiveness of these interventions. Second, agriculture, whose productivity is low, remains the main source of income and employment to the households especially the chronically poor households. With the return of peace in the region, addressing the low agricultural productivity is likely to play a key role in the fight against chronic poverty. On the other hand, creation of

employment outside the agricultural sector should be supported. There should be a deliberate strategy for investment in the poorest through asset accumulation – e.g. livestock re-stocking programme. The paper makes a case that chronic poverty should be recognized as a distinct dimension of poverty in government's strategy against poverty if Uganda is to achieve MDG 1 by 2015.

Keywords: chronic poverty, poverty dynamics, panel data, Uganda, Northern Uganda

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1.0 INTRODUCTION

Over the past two decades Uganda has seen remarkable economic growth attributed largely to prudent macroeconomic management. On average, real Gross Domestic Product (GDP) was registered at 7.9 percent per annum during 2001/02-2008/09. However, the steady growth was interrupted by the onset of the global financial crisis in the second half of 2008. The global financial crisis second round effects impacted on Uganda's domestic economy as growth slowed down from 9 percent in 2007/08 to 7 percent in 2008/09, in real terms (Bank of Uganda, 2009). The main transmission channels through which the global financial crisis might have impacted the economy include: exports especially of the traditional exports such as coffee, remittances and foreign direct investment (Ssewanyana and Bategeka, 2010; Ssewanyana *et al*. 2009). While the services sector continues to drive the growth process, its share in terms of employment remains low. The agricultural sector where the majority of the poor derive their livelihood recorded minimal growth (of 2.2 percent per annum in real terms, over the period 2001/02-2008/09) well below the population growth rate (of 3.2 percent per annum). In other words, the high growth rates in the services sector seem not to have generated enough jobs to address the unemployment problem in the country. Growth continues to take place in those sectors of the economy where the majority of the poor and, in particular, the chronically poor have limited participation.

There is no doubt that the sustained growth led to significant reduction in income poverty. Poverty reduced from 56 percent in 1992/93 to 34 percent in 1999/00 before rising to 37.8 percent in 2002/03 thereafter declined to 31.1 percent in 2005/06. However, the high population growth and poor performance of agriculture have greatly slowed down poverty reduction in absolute terms. The number of persons living below the official poverty line stood at 9.8 million in 1992/93 and 8.4 million in 2005/06. The incidence of income poverty has a spatial dimension. The disproportionate contribution of rural areas to national poverty has remained above 90 percent and the contribution of Northern Uganda has been increasing over time from 26.1 in 1992/93, 29.6 percent in 2002/03 to 38.5 percent in 2005/06 (Ssewanyana and Okidi, 2007). The Northern region remains poor and made less progress in poverty reduction.

Despite the aforementioned progress in poverty reduction and impressive growth, challenges do remain in achieving sustainable poverty reduction and inclusive growth in

Uganda. Worth noting, poverty reduction in Uganda has been marked with increasing inequality (Ssewanyana and Okidi, 2007). The high inequality mitigates the positive impact of growth on poverty reduction (Ssewanyana, 2008). The persistent inequality partly explains the slowdown in poverty reduction in Uganda since the turn of the century. The relatively slower economic progress in the north has also contributed to an increase in inequality. Regional imbalances between the north and the rest of the country have persisted and seem to be widening. In other words, there is growing importance of between-region inequality in explaining overall levels of inequality in Uganda. Overall, not all Ugandans seem to have participated in the growth process and the benefits of growth have not been equitably shared. The recently launched five-year National Development Plan (NDP) 2010/11-2014/15 highlights the need to ensure that all regions of the country benefit from growth equitably (Republic of Uganda, 2010).

While these poverty measures based on periodic cross-sectional household surveys have been used widely by policymakers in understanding the extent of poverty and subsequently informing the design of anti-poverty interventions in Uganda, these measures have masked significant differences in progress in poverty reduction. Despite the impressive growth at macro level and poverty reduction during the 1990s, chronic poverty emerged as a major policy concern. Using the Uganda National Panel (UNPS) data of 1992/93 to 1999/00, about 20 percent of households with more than 7 million persons were estimated to live in chronic poverty (CPRC, 2005). In other words, a significant proportion of households were left in chronic poverty despite the progress at macro level. The disproportionate contribution of Northern Uganda to national chronic poverty remains high at about one-third. The time to fight chronic poverty is now if Uganda is to attain Millennium Development Goal (MDG) 1: to halve absolute poverty by 2015. Indeed, CPRC (2008) classifies Uganda as a partially chronically deprived country[1] (Anderson, 2007).

The UNPS data covering 1,309 households has been extensively used to provide insights into poverty dynamics in Uganda (see for example, Deininger and Okidi, 2003; Okidi and McKay, 2003; Lawson *et al.*, 2004; CPRC, 2005; Ssewanyana and Bategeka, 2007; Ssewanyana, 2009). These studies have enriched the understanding of poverty dynamics in Uganda. From a policy perspective, however, this panel data seem to be outdated given the various

[1] Partially chronically deprived country as chronically deprived in child mortality, fertility and under-nourishment but not in GPD per capita (Anderson, 2007 p.7).

government poverty reduction strategies and interventions implemented since the turn of the century. On a positive note, the Uganda Bureau of Statistics (UBoS) embarked on a seven-year Uganda National Panel Programme with the first wave that started in September 2009 and expected to end in August 2010. This demonstrates government's increasing demand for understanding the extent and nature of poverty. The various studies on poverty dynamics in Uganda have demonstrated the need for government to refocus its anti-poverty targeting interventions. The poor are not a homogenous group in Uganda – calling for a sharper policy focus if Uganda is to meet the first MDG. It is important to monitor whether people move in or out of poverty; and the possible policy options.

This paper provides new evidence on poverty dynamics and, in particular, chronic poverty in Uganda by focusing on Northern Uganda Social Action Fund (NUSAF) region[2] using the first ever comprehensive Northern Uganda Survey (NUS) panel data from 2004 and 2008. The year 2004 marked the climax of the conflict in the region, whereas 2008 marked return of relative peace in the region. This paper is timely in providing evidence on poverty dynamics for a region recovering from a two decade war conflict. Northern Uganda is the least developed and poorest region in Uganda; and is said to be dragging Uganda's achievement on the MDGs. The region is characterised with high poverty rates and low level human capital development (Ssewanyana *et al*., 2006). Using the UNPS data, Lawson *et al.* (2004) found this region to be a home to nearly one-third of the chronically poor households well above its population share of about one seventh at that time. There are government targeted interventions to the lagging areas as highlighted in the PEAP and various interventions by humanitarian bodies. Yet, these targeted interventions on top of the universal interventions such as Universal Primary Education (UPE) have yielded mixed results in Northern Uganda. Such poverty interventions programs include NUSAF among others. The NUSAF programme benefitted the non-poor communities more than the poor ones. With the Peace, Recovery and Development Plan (PRDP) and NUSAF II, the question for policy is whether such efforts are adequate in addressing chronic poverty among the population.

[2] NUSAF region at the time included the sub-regions of West Nile, Acholi, Lango, Teso and Karamoja. The geographical coverage was extended during 2007/08.

This context makes it interesting to analyse the dynamics of poverty and determinants of chronic poverty and the social groups that might have been most affected. The paper explores the drivers of chronic poverty and how they corroborate with those identified using the UNPS data by various researchers; and whether the determinants of chronic poverty differ significantly from those of transient poverty. What do these changes, if any, mean in terms of informing policy? The findings of this paper are highly informative in terms of informing the chronic poverty agenda in Uganda at national level.

The remainder of the paper is organised as follows. Section 2 presents the methods and describes the panel data used in this paper and its limitations in providing the latest evidence on the status of chronic poverty in Uganda. Section 3, presents and discusses the results. This section first describes the poverty trajectories by selected characteristics, and then presents in-depth analysis via econometric analysis. Conclusions and implications for policy are presented in section 4.

2.0 METHODS AND DATA

This paper focuses on monetary poverty computed using household consumption expenditure[3] per adult equivalent as the welfare measure to be consistent with the previous poverty researches on Uganda (for details see, Ssewanyana and Okidi, 2007). The household is poor if its consumption expenditure per adult equivalent is below the official poverty line as derived by Appleton (2001) using the cost of basic needs approach. This paper expresses the two variables in 2005/06 prices.

There is growing literature on measuring chronic poverty: the components approach of Jalan and Ravallion (1998) and spells approach Bane and Ellwood (1986). The spells approach focuses on the length of time that the household/individual has had consumption expenditure/income below the poverty line. Under this approach, a household/individual is said to be chronically poor if per adult consumption expenditure is below the poverty line in all observed time points; and transiently poor if a household/individual has been poor only temporarily. In contrast, the components approach is largely based on the concept of permanent (average) consumption or income; and it does not distinguish between chronic and transient poor households/individuals. On the other hand, the recent literature on poverty measurements calls for the dimensional nature of poverty (Hulme and McKay 2007; Barrientos *et al.* 2005). This paper follows the spells approach based on a two-period household panel data and focuses on income poverty. A household that is poor in both periods is considered to be chronically poor, while a household that is poor in only one of the period is classified as vulnerable or transient poor. While some have argued that chronic poverty can be intergenerational (Moore 2005), this aspect is outside the scope of this paper.

The paper employs two approaches: profile of poverty dynamics by selected characteristics; and in-depth analysis via econometric analysis. On the latter, different approaches have been employed to distinguish the determinants of chronic poverty from transient poverty. Studies such as Lawson *et al.* (2004) and Benin and Mugarura (2006) used a sequential approach in Uganda; and Multinomial Logit model (Blauch and McClouch, 1998 in Pakistan; Quisumbing, 2007 in Bangladesh). Blauch and McClouch (1998) employed the Ordered Logit

[3] . Household consumption expenditure includes all items consumed from different sources but excludes consumption of one off expenses e.g expenditures on funeral, ceremony etc.

model to examine the relative influence of selected characteristics on the probability of being in a given poverty state. Another estimation issues raised in literature is that of selection of explanatory variables. Some have included the initial characteristics (), change in the variables (Neilson *et al.,* 2008) or a combination (see for example, Lawson *et al.,* 2004). However, use of change in variables raises endogeneity problem and (Glewwe, 2005) points out that use of initial characteristics mitigates this problem.

The paper, first, employs an Ordered Logit model to empirically examine the relative impact of the initial conditions in 2004 on the likelihood of being in a given poverty state, and in particular in chronic poverty; and thereafter employs the Multinomial Logit model to examine whether the determinants of chronic poverty are significantly different from those of transient poverty. Some modifications of Lawson *et al.* (2004) are introduced to better understand poverty dynamics in the NUSAF region. Separate regressions for the sub-regions are estimated in addition to that of the entire region to provide more insights into the determinants at a disaggregated level. Unlike the descriptive analysis, the process that underlies poverty mobility during the panel period is divided into three mutually exclusive alternatives: chronic poor, transient poor (a combination of those households that moved out and slipped into poverty) and non-poor. The Multinomial Logit model equation is as expressed in Eq. (1) and determines the probability of a household *i* experiences one of the *j* outcomes (of being chronic poor, transient poor or non-poor). Y_i is the outcome experienced by household i, β_k are set of coefficients to be estimated and x_i includes initial conditions in 2004 including household level characteristics, head of household characteristics as well as community characteristics. β_0 has been set to zero (defined as a base category – never poor) in order to identify the model. All the β_k are estimated in relation to this bench mark.

(1) $P(Y_i = j) = \frac{e^{\beta'_j x_i}}{1+\sum_{k=1}^{J} e^{\beta'_j x_i}}$ for j=1, 2, ...J and $P(Y_i = 0) = \frac{1}{1+\sum_{k=1}^{J} e^{\beta'_j x_i}}$

On the data source, the paper makes use of the first ever comprehensive panel survey data on NUSAF region conducted by UBoS in two rounds: the first in 2004 and then in 2008. The 2004 round survey was regionally representative with a sample of 4,721 households drawn from the five sub-regions of NUSAF[4]. The second round of 2008 was able to track 3,572

[4] NUSAF sub-regions include: West Nile, Acholi, Lango, Teso and Karamoja. The survey estimates were representative at district level.

households. Sample attrition between survey rounds was 25 percent[5], well above the attrition rate of 6 percent for the national-wide UNPS. At sub-regional level, attrition was highest in West Nile and least in Teso sub-region. The problems of attrition and measurements in panel data and their impact on poverty estimates have been emphasised in literature. However, the paper by Ssewanyana and Kasirye (2010) show that attrition in NUS panel was random. On the other hand, the effect of the measurement errors is mitigated by using the initial conditions in 2004.

The analysis is limited to households that were covered in both survey rounds. Other estimation and data issues considered include sample weights[6], heteroskedasticity, clustering (possible non-independence of observations from the same sampling unit) and multicollinearity. The appropriate univariate and econometric results (means and standard errors) are reported, which are adjusted for sample weights and robust heteroskedasticity and clustering.

The survey collected information at individual, household and community levels on a wide range of characteristics including: household roster, education, health, economic activities, housing conditions, household consumption expenditure, and community infrastructure. Similar survey instruments were used with minor adjustment to capture the impact on NUSAF community projects. Efforts were made by UBoS to revisit the households during the same month as in 2004. For further details on the respective survey round, see NUSAF Impact Evaluation Report (UBoS, 2009).

Description of variables

The model variables include household and community level variables in 2004: a) the characteristics of the household head including age as proxy for life cycle effects, gender and marital status; (b) variables indicating different levels of household dependency including household size and demographic composition by sex and age; human capital variables (household head's years of schooling, share of other adult[7] members with a given educational attainment level, share of literate adults); household wealth indicated by the value of assets owned including livestock/poultry and farm equipment all expressed in 2004

[5] See Ssewanyana and Younger (2009) for the detailed explanations for this high sample attrition.
[6] . UBoS re-weighted the sample weights of 2004.
[7] . The paper defines an adult as a person aged 15 to 59 years.

prices[8], and size of land; livelihood variable indicated by the proportion of adult members in a given economic sector; household shocks proxied by incidence of death of household member(s) – permanent loss; and proportion of adult members reporting ill-health in the past 30 days prior to the interview (transitory event). The paper uses consumption expenditure per adult equivalent as derived in Ssewanyana *et al.* (2006) and Ssewanyana and Younger (2009) – all expressed in 2005/06 prices. Community variables include: community infrastructure (roads, markets, police station, and social services); incidence of cattle rustling in the community; and presence of NGO assisting IDP/abductees within 5km. The rural/urban dummies and sub-regional dummies are included to control for location conditions. The unit of analysis is the household unless stated otherwise.

[8] . The composition of livestock (goats, cattle, oxen, sheep and pig) and poultry; farm equipments includes hoe, plough.

3.0 RESULTS

This section presents the results based on the methods discussed above. First, the paper presents and discusses the profile of poverty dynamics by selected characteristics. The discussion is limited to notable differences. Second, the econometric results are presented and discussed.

3.1 Poverty dynamics profiling

The region recorded a significant increase of 6.1 percent in the per adult equivalent consumption expenditure during the panel period leading to a significant reduction in poverty. Going by Ravallion and Chen (2003) approach, the pattern of consumption growth between 2004 and 2008 was pro-poor. The growth in consumption was faster in lower percentile groups relative to the better off groups (Figure 1). The only exception is the sub-region of West Nile.

The percentage of persons living below the poverty line fell significantly from 67.5 to 57.5 percent between 2004 and 2008 respectively (Table 1) translating into a reduction in the number of poor persons from 5.3 million to 4.6 million respectively. However, poverty in this region remains well above the national poverty headcount of 31 percent in 2006. Nonetheless, these poverty rates provide evidence of the decline in the proportion of poor persons during the four years. The decline was largely driven by the return of peace in the region. At sub-regional level, all sub-regions experienced significant poverty reduction. The only exceptions are the sub-regions of West Nile and Karamoja. Further Table 1 shows that inequality of income as measured by the Gini coefficient declined from 0.386 in 2004 to 0.360 in 2008 for the entire region, though the decline was not statistically significant. Similar observations are noted at sub-regional level. The only exceptions are the sub-regions of Karamoja and Teso, where distribution of income significantly improved at 10 percent level of significance. The results further reveal significant poverty mobility, which the paper delves into to discuss the underlying determinants during the panel period. The analysis hereinafter focuses at household level unless stated otherwise.

Table 1: Poverty headcount and Gini Coefficient

Location	Headcount, %		Gini coefficient	
	2004	**2008**	**2004**	**2008**
All NUSAF	67.5	57.4	0.386	0.360
NUSAF excluding Teso sub-region	68.4	59.1	0.388	0.366
Place of residence:				
Rural	70.7	61.1	0.329	0.316
Urban	40.1	25.7	***0.497***	***0.432***
Sub-region:				
West Nile	65.6	59.6	0.359	0.339
Acholi	***69.2***	***59.6***	0.453	0.361
Lango	65.5	51.2	0.339	0.376
Teso	65.1	52.9	***0.379***	***0.342***
Karamoja	82.4	77	***0.410***	***0.365***

Source: Author's calculations based on NUS 2004 and 2008.
Notes: i. Shows the proportion of persons living below the poverty line.
ii. Estimates in shade indicate significant change at 5% and those in bold and italics indicate significant change at 10%.

Table 2 shows that of the 64.6 percent poor households in 2004, 37.9 percent were not poor in 2008, while 34.1 percent of the non-poor in 2004 fell into poverty and accounted for 23.1 percent of all the poor in 2008. Nearly 40.2 percent of the households (with 3.57 million persons[9]) remained poor in both periods whereas 36.6 percent were transiently poor (with 2.76 million persons). Overall, about 76.8 percent of the households in the region had household consumption expenditure per adult equivalent below the poverty line at some point during the four-year period. Despite the observed significant reduction in poverty, poverty in this region remains a big development challenge. Notably, the proportion of households living in chronic poverty is significantly higher than that in transient poverty. The new evidence, therefore, suggests that chronic poverty is more prevalent than transient poverty in this part of the country. This finding is contrary to the findings of Lawson *et al*. (2004) – the transitory poor households were two-fold those in chronic poverty for entire Uganda. However, disaggregated analysis reveals mixed results. Chronic poverty is significantly more prevalent than transient poverty in rural areas and in the sub-regions of West Nile and Karamoja; transient poverty is significantly more prevalent than chronic

[9] . This estimate of 3.57 million persons living in chronic poverty between 2004 and 2008 is well above the 2.3 million persons between 1992/93 to 1999/00.

poverty in urban areas and in Lango sub-region; and there are no significant differences for the sub-regions of Teso and Acholi, Table 3. These results show significant sub-regional differences. The findings suggest that government anti-poverty interventions cannot be applied uniformly within the NUSAF region, supporting the need to have a better understanding of poverty dynamics among policymakers. These findings seem to suggest that to some extent the nature of poverty in this part of the country has changed based on the panel data of UNPS and NUS.

Table 2: Poverty transition matrix, 2004-2008

	2008		
2004	Poor	Non-poor	Row %
Regular poverty			
Poor	62.1	37.9	64.6
Non-poor	34.1	65.9	35.4
Col (%)	52.2	47.8	100.0
Extreme poverty			
Poor	41.4	58.6	43.6
Non-poor	21.9	78.1	56.4
Col (%)	30.4	69.6	1.364

Source: Author's calculations based on NUS panel 2004 and 2008.
Note: i) Transiently poor households 36.6% ((37.9*64.6+34.1*35.4)/100); chronically poor households 40.2% (62.1*64.6)/100;
ii) Transiently poor households 37.8% ((58.6*43.6+21.9*56.4)/100); chronically poor households 18.1% (41.4*43.6)/100;
iii) **Regular poverty** based on the absolute poverty line whereas **extreme poverty** based on the food poverty line.

Chronic poverty can be severe depending on how far the household is below the poverty line. Using the food poverty line, the share of households in transient poverty does not change much, however, the share of the chronically poor declines to 18 percent (with 1.64 million persons) (Table 2). Thus, nearly 44.9 percent of the chronically poor households lived below the food poverty line during the panel period. On the other hand, the findings reveal that the income of the chronically poor increased during the panel period (see also Figure 2(a)) but not significant enough to push the households above the poverty line. However, in Karamoja sub-region about 41 percent of the households were in severe chronic poverty.

Table 3: Poverty trajectory by sub-region

	Chronic poverty	Moved out poverty	Slipped into poverty	Never poor	Total % row	Total #HH, '000
All NUSAF region	40.2	24.5	12.0	23.3	100.0	1,364.8
NUSAF excl. Teso region	41.8	24.0	12.2	21.9	100.0	1,031.7
Place of residence:						
Rural	43.4	25.1	12.4	19.2	100.0	1,189.8
Urban	18.4	20.2	9.7	51.7	100.0	174.9
Sub-region:						
West Nile	42.3	22.0	12.1	23.6	27.3	373.1
Acholi	39.4	26.8	13.6	20.3	17.6	240.1
Lango	33.8	27.7	12.3	26.2	21.9	298.5
Teso	35.0	25.9	11.5	27.6	24.4	333.1
Karamoja	65.1	15.8	9.5	9.5	8.8	120.0
Contribution to poverty:					**Pop. share**	
West Nile	28.8	24.5	27.5	27.6	27.3	
Acholi	17.2	19.2	19.8	15.3	17.6	
Lango	18.4	24.7	22.4	24.6	21.9	
Teso	21.3	25.8	23.3	28.9	24.4	
Karamoja	14.2	5.7	7.0	3.6	8.8	

Source: Author's calculations based on NUS panel 2004 and 2008.

Table 3 further shows that there are clear spatial differences. In contrast to findings from the earlier study by Lawson *et al*. (2004), more households were more likely to have moved out than fallen into poverty between 2004 and 2008. This finding holds for all sub-regions. Worth noting is the finding that the sub-regions of West Nile and Karamoja contribution to overall chronic poverty was higher that their population share in the NUSAF region. Nearly 28.8 percent of chronically poor households were residents in West Nile compared to its population share of 27.3 percent; Karamoja was 14.2 percent nearly double its population share of 8.8 percent. Explanation for the higher incidence of chronic poverty in West Nile merit further research, which is beyond the scope of this paper.

Consistent with previous poverty dynamics studies on Uganda, the chronically poor households are characterised by larger household size, higher dependency ratio, and lower levels of human capital, among others, Appendix 1. However, there are notable changes in these characteristics during the four-year panel period worth mentioning. Taking the entire NUSAF region, the household size significantly increased from 5.5 in 2004 to 5.8 persons in

2008, with households slipping into poverty registering the highest significant increase from 4.6 to 6.0 persons over the same period. The increase was largely driven by significant increase in the number of children below six years of age: from 2.4 children to 3.3 children. It is worth noting that households that moved out of poverty were more likely to report significant reduction in household members contrary to their counterparts in other poverty states Appendix 1.

Nearly half of the households registered increases in household size, largely driven by increases in number of children. This is not surprising given the high fertility rates in the region. Total fertility rate was estimated at more than 7 children per woman in 2006 and contraceptive use remains well below the national average (UBoS and Macro International, 2007).

The NUSAF region has the lowest education attainments compared to the rest of the country. And this has been exacerbated by the more than the two decades conflict. For instance, Ssewanyana *et al.* (2006) found that rebel activity was by far the most important reason for school closures in this region. On average, households in chronic poverty are headed by individuals with 3.6 years of schooling well below the NUSAF region average of 4.7 years.

Further analysis of the educational status of other adult members reveals that nearly one fifth in chronically poor households has no formal education compared to 7.5 percent in non-poor households, and 15 percent for the entire region. The tendency for children starting school late as cited in Ssewanyana *et al.* (2007) remains a challenge in the region.

The gross enrolment rate at primary level increased by about 4 percentage points from 121.8 percent in 2004 to 125.4 percent in 2008. The increase is observed by poverty trajectory with the exception of households that escaped from poverty. On the other hand, the net enrolment rate (NER) remained constant at 78 percent during the panel period well below that at national level of 85 percent in 2005. As expected, NER stood at about 74 percent for households in chronic poverty lower than the NUSAF region average.

Notably, the enrolment gap between the chronically poor and non-poor households has narrowed considerably. Indeed the low education levels call for significant investment in human capital in the post-conflict.

The incidence of reporting ill-health at household level, on average, increased significantly from 65.8 percent in 2004 to 69.9 percent in 2008. This increase was largely driven by households that escaped from poverty, which increased from 66.4 percent to 74.1 percent respectively. There are no significant increases for households in other poverty states. And there are no notable significant differences between households in chronic poverty and entire region.

Turning to employment status of household members, Appendix 1 reveals that the proportion of adult members reporting agriculture as the main economic sector increased significantly from 60 percent in 2004 to 69 percent in 2008. This share does not differ significantly from that reported by Lawson *et al.* (2004) of 65.5 percent in 1999. It is also evident from the data that nearly 66.3 percent of the households derive their livelihood only from agriculture.

The limited livelihood opportunities are not surprising for a region that has been under conflict for more than two decades. The importance of agriculture as the main source of livelihood both in terms of employment and source of income cannot be overemphasised. This is also true for the non-poor households. More than half of the non-poor households rely on agriculture as the main economic activity and about sixty percent reported agriculture as the main source of income. The chronically and transiently poor households registered a significant increase in adult members who reported agriculture as the main activity. Overall these findings suggest a significant importance of agriculture in the NUSAF region. Bidwell et al. (2008) assert that agriculture would lead to recovery of the local economy. This demonstrates that improving the lives of the people in this region cannot be divorced from improving the productivity of agricultural sector.

With the exception of non-poor households, the share of adult earners in total adult population increased significantly over the panel period. The share in chronically poor households matches that of other households in other poverty states. In other words, the adults in chronically poor households are equally as active as their counterparts in other poverty states. Individual adults in chronically poor households are not 'lazy', they take the same initiative as individuals in other poverty states to look for work yet they remain poor. It is also clear that the share of female earners is higher than that of their male counterparts. Notably the ratio of children to adult earners is higher among the chronically poor households. On the other hand, the ratio significantly increased for those households

that slipped into poverty. The reverse is observed for households that moved out of poverty, Appendix 1.

The proportion of households with adult members employed in the construction and manufacturing declined significantly from 6 to 3 percent in 2004 and 2008 respectively. Significant reductions were also observed for households in chronic poverty and non-poor households. Partly due to return of relative peace in the region, there was a significant reduction in the share of non-working adults. The survey questionnaire elicited information from households on their main source of income during the past 12 months prior to the survey.

Broadly speaking, while the share of households relying on agriculture increased during the panel period, the increase was not significant. Notable significant reductions are only observed for remittances/transfers as the main source of income. It is evident that the chronically poor households have a higher dependency on agriculture as the main source of income relative to the other households. Eight out of ten chronically poor households reported agriculture as the main source of income. As expected, non-poor households were more likely to record non-agricultural source relative to their counterparts.

Relating changes in household consumption expenditure with changes in adult earners, the results in Table 4 reveal that 35.9 percent of the households in the region experienced reduction in incomes. Increases in number of adult earners did not translate into increased incomes to households – this suggests low returns to labour. Among the households that reported a reduction in income, those that slipped into poverty contributed the most. A greater proportion of chronically poor households registered increases in incomes though these increases were not high enough to push these households out of poverty.

Table 4: Changes in household consumption expenditure by poverty trajectory

Change in income/earners	Chronic poverty	Moved out poverty	Slipped into poverty	Never poor	Total % row	Total #HH, '000
% experienced reduction in consumption expenditure with:						
- No change in adult earners	39.1	6.2	27.4	27.3	43.1	211.6
- Increase in adult earners	41.3	4.4	35.5	18.8	30.7	150.5
- Reduction in adult earners	44.6	14.9	13.1	27.3	26.2	128.4
Column %	41.2	8.0	26.2	24.7	100.0	490.6
% experienced increase in consumption expenditure with:						
- No change in adult earners	37.0	36.6	3.1	23.3	46.9	410.1
- Increase in adult earners	35.9	21.3	5.1	18.8	38.0	332.4
- Reduction in adult earners	11.5	14.0	0.6	6.0	15.1	131.6
Column %	84.4	71.9	8.8	48.1	100.0	874.2
%with reduction in income	36.9	11.7	78.1	38.0	35.9	1,364.8

Source: Author's calculations based on NUS 2004 and 2008.
Notes: An earner is a person that reported being engaged in any economic activity during the past 7 days prior to the survey.

Asset ownership is increasingly being used as an indicator of welfare – it comes with direct benefits to households but as well as a store of wealth which households can draw upon in times of crisis (Antonopoulous and Floro 2005). In other words, it provides insights into the capacity of the people to manage their vulnerability to poverty. Here the focus is on physical assets. While the incidence of ownership of assets varies considerably across poverty trajectory, it is evident that more households reported ownership in 2008 compared to 2004 (Appendix 3). The assets most frequently owned were hoes, followed by building. It is evident that fewer than 10 percent of households reported owning donkey, boat/canoe, vehicle, motorcycle, or television among others in 2008. Here the focus is to examine the trends in ownership of livestock/poultry, bicycle and selected ICTs.

Broadly speaking, 18.8 percent had no livestock/poultry and only 5.5 percent had no farm equipment. The chronically poor households accounted for 36.3 percent and 37.8 percent respectively. Livestock ownership was dominated by goats (58.2 percent) followed by cattle (26.4 percent) in 2008. A bicycle is a means of transport in most rural areas in Uganda. In the NUSAF region, on average, the proportion of households owning a bicycle increased from 42.8 percent in 2004 to 48.5 percent in 2008. The corresponding figures for households in chronic poverty were 36 percent and 39.5 percent respectively. Ownership of

a radio set remains low – stood at 30 percent for chronically poor households well below the regional average of 42.6 percent in 2008. Similar results are noted for ownership of mobile phone. Less than one percent of households in persistent poverty owned a mobile phone compared to 19.3 percent for the entire region. The low household income could probably explain the low ownership of ICT in form of mobile phones and radios. Overall, the findings seem to suggest low asset ownership especially among the chronically poor. Those households that moved out of poverty registered the largest increase in ownership of bicycle, poultry, cattle and mobile phones. The role of assets in this case merits further research.

Land tenure is largely customary in this part of the country (MoFPED, 2009) although Adoko and Levine (2004) assert that land is no longer communal instead it is owned and managed by individual families. Regardless of this, land tenure impacts on investment uncertainties. Nearly 19.1 percent of the households were landless of which 39.5 percent were chronically poor households in 2004. At median, the chronically poor households held 4.2 acres (0.79 acres per capita) compared to the NUSAF region overall average of 6.0 acres (1.63 acres per capita).

Households' access to community infrastructure by their respective poverty trajectory is presented in Appendix 4. Poor access to infrastructure impacts on welfare of the population indirectly through high transaction costs and directly through inability to benefit from public services. It is evident that households' access to most of the selected infrastructure significantly improved during the panel period. The only exceptions are access to primary school, secondary school and feeder roads. Notably, access is relatively lower for the chronically poor households compared to their counterparts in other poverty states. While the share of household with access to safe drinking water increased significantly over the four-year period, physical access within 1 km significantly reduced. This is probably due to the resettlement of persons formerly in internally displaced persons' camps to areas which areas initially abandoned. The presence of the army in communities significantly reduced whereas the opposite is observed for police. There are no marked significant differences between the chronically poor households and the entire NUSAF region, on average. Instead, the chronically poor households seem to be catching up with the entire region.

Previous studies (CPRC 2005) noted that the chronically poor are more likely to have more elderly persons, orphans, widows, women and persons living with disabilities. Table 5 presents changes in the share of these vulnerable groups over the four-year period. Broadly speaking, the share of these vulnerable groups increased significantly. The share of children with at least one parent dead increased for the entire region, and for households in chronic poverty and those that slipped into poverty. Similarly, the share of persons living with disabilities increased significantly for the entire region, driven by a significant increase in non-poor households. The share of widows increased significantly for households living in chronic poverty and those that moved out of poverty.

The share of elderly persons increased significantly from 5.5 percent in 2004 to 7.3 percent in 2008 for the entire region, with significant increases also observed for those households that escaped from poverty. At individual level, the number of orphans with at least one parent dead increased by 26.3 percent driven largely by households that slipped into poverty. The disabled persons increased 9.9 percent and elderly persons by 21.2 percent over the four-year period. But more notable, these vulnerable groups are more likely to be chronically poor.

Table 5: Share of households with selected vulnerable groups by poverty trajectory, %

Vulnerable group	Chronic poverty	Moved out of poverty	Slipped into poverty	Never poor	All
Children below 18 years:					
- With at least one parent dead, 2004	***15.1***	16.0	10.9	12.9	14.3
- With at least one parent dead, 2008	***18.2***	19.6	18.8	15.3	17.9
- With both parents dead, 2004	3.3	3.7	2.1	3.7	3.4
- With both parents dead, 2008	4.3	4.7	3.3	4.2	4.3
Female adult members, 2004	49.8	52.9	56.9	53.9	52.4
Female adult members, 2008	50.3	54.0	55.0	55.4	53.0
Persons living with disabilities, 2004	7.1	7.9	7.7	***7.8***	7.5
Persons living with disabilities, 2008	7.3	9.6	8.6	***10.7***	8.8
Widows, 2004	4.1	5.7	8.6	8.2	6.0
Widows, 2008	5.4	9.1	9.1	9.4	7.7
Divorcees, 2004	***1.6***	2.8	3.8	4.6	2.9
Divorcees, 2008	***2.5***	4.0	2.3	4.3	3.3
Elderly persons, 2004	4.0	6.5	5.6	6.8	5.5
Elderly persons, 2008	5.0	9.3	7.2	8.9	7.3

Source: Author's calculations based on NUS 2004 and 2008.
Notes: Shaded estimated indicate significant at 5% and estimates in italics indicate significant change at 10%.

Table 6 shows that the proportion of households reporting death of a household member in the past 12 months prior to the interview reduced from 10.6 percent in 2004 to 6.1 percent in 2008. Child deaths reduced by more than two-fold over the panel period. The return of peace in the region and resettlement of formerly IDP population largely explains this significantly reduction in child mortality. It is noticeable that the chronically poor households had a higher share relative to other poverty trajectory. The distribution of death of either household head or spouse does differ from the overall picture. Deaths among the chronically poor households accounted for 38.4 percent of all deaths in 2008 compared to 34.4 percent in 2004. On the other hand, the proportion of children in total death significantly reduced from 55.1 percent in 2004 to 40.4 percent in 2008. Most importantly, members in chronically poor households are more likely to die as children than adults. This corroborates with CPRC (2008) and Ssewanyana (2008) that chronically poor persons die prematurely from easily preventable diseases. On the cause of death, malaria/fever accounted for 28 percent in total deaths, HIV/AIDS accounted for 7.8 percent and insecurity accounted for 5.5 percent of the total deaths in 2004. Malaria was cited as the most common killer disease among children (Ssewanyana *et al.* 2006). This shows that a large proportion of the people in NUSAF region still die from preventable diseases.

Table 6: Incidence of death by poverty trajectory

Relation to the head	Chronic poverty	Moved out poverty	Slipped into poverty	Never poor	Total % row	Total #deaths
2008						
Head	40.1	46.8	2.6	10.5	6.2	5,598
Spouse	28.4	39.7	13.2	18.7	10.6	9,514
Children	40.2	33.4	6.1	20.3	40.4	36,261
Others	38.2	36.1	7.4	18.4	37.7	33,844
Not stated	43.5	32.8	21.1	2.6	5.1	4,620
Total # column, %	38.4	35.9	7.9	17.9	100.0	89,837
2004						
Head	33.8	17.8	26.2	22.2	5.6	8,651
Spouse	27.2	14.6	16.6	41.6	4.8	7,402
Children	36.6	29.1	7.9	26.3	55.1	85,107
Others	31.7	32.3	7.2	28.8	33.7	52,105
Total # column, %	34.4	28.6	9.5	27.4	100.0	154,502
						Total #HH
2004	35.2	26.9	9.8	28.1		144,502
2008	40.2	35.3	7.2	17.3		83,087

Source: Author's calculations based on NUS Panel data 2004 and 2008.

Table 7 shows the most serious shock as ranked by the households. It is evident that the proportion of households reporting agriculture and death/ill-health shocks increased over the panel period and the reverse is noted for those reporting rebel activities. While the distribution varies within each poverty state, agriculture seems to dominate other shocks. A higher proportion of the chronically poor households experienced agriculture shocks than the regional average.

Table 7: Most serious shocks by poverty trajectory, %

Type of shock	Chronic poverty			Moved out of poverty			Slipped into poverty			Never poor			All	
	2004	2008		2004	2008		2004	2008		2004	2008		2004	2008
No shocks	4.1	8.0		5.2	7.9		8.9	9.7		8.8	18.2		6.1	10.6
Agriculture	41.2	64.2		39.5	51.9		37.6	58.3		37.1	49.8		39.4	57.1
Death/illness	9.6	12.8		10.5	23.3		10.8	13.3		13.1	17.7		10.8	16.6
Rebels	41.6	7.1		40.1	9.0		39.3	11.9		35.7	7.1		39.6	8.1
Theft	0.9	1.5		2.1	2.3		1.0	1.4		2.3	2.6		1.5	2.0
Other	2.6	5.7		2.5	5.2		2.5	4.9		3.0	3.5		2.7	5.0
Not stated	0.0	0.7		0.0	0.4		0.0	0.5		0.0	1.0		0.0	0.7
Total	100.0	100.0		100.0	100.0		100.0	100.0		100.0	100.0		100.0	100.0

Source: Author's calculations based on NUS 2004 and 2008.

The survey rounds captured qualitative information on food security and welfare indicators. Relating this to poverty trajectory, some interesting findings do emerge. Appendix 2 reveals that one fifth of the households had a single meal during the past seven days prior to the interview of which 52.1 percent were households in chronic poverty. It is noticeable that there was a significant increase in percentage of households that slipped into poverty surviving on a single meal on daily basis. Appendix 2 further reveals low consumption of protein rich foods in the region, with only 15.9 percent, 37.3 percent and 48.2 percent of the households reporting consumption of milk, meat and fish respectively during the last seven days prior to the survey in 2008.

While no significant changes are observed at aggregate level during the panel period, there are significant increases/decreases among households that escaped/slipped into poverty.

Borrowing salt during the last 30 days prior to the survey was also a common phenomenon, though the practice has significantly reduced. The practice was more prevalent among the chronically poor and those that slipped into poverty. Considering, basic needs including clothing and shoes, significant improvements are noted for the entire region and for different poverty states. The only exceptions are those households that slipped into poverty. The proportion of chronically poor households with members having at least a pair of shoes increased significantly from 3.9 percent in 2004 to 10.5 percent in 2008. However, these figures are well below the regional averages. Overall, these findings confirm that the chronically poor households are also disproportionately deprived of food and other basic needs.

The above descriptive analysis reveals that the characteristics vary across poverty trajectory but also that some of these characteristics have significantly changed over time within each poverty state. It is evident that incidence of chronic poverty is significantly higher than transient poverty for the NUSAF region as a whole. However, it is also evident that regional estimates can obscure enormous sub-regional differences. The paper complements the above descriptive analysis with an explicitly multivariate investigation in the subsequent section. Households that slipped into and those that moved out of poverty are combined to form the transiently poor/vulnerable households. The estimations are done for the entire region and separate for each sub-region.

3.2 Econometric results

This section presents the econometric results for three poverty trajectories: chronic, transient and non-poor. The Ordered Logit model results[10] show the relative impact of the initial conditions on the probability of being in a given poverty state. It is evident that household head's years of schooling, share of other adults with secondary education or higher, proportion of literate adults, households headed by a married female, share of adult female, share of elderly persons, share of adults reporting ill-health and sought treatment, incidence of death of a household member, value of livestock/poultry, value of farm equipment, share of adults in trade, construction and other sectors, living in urban areas and in the sub-regions of Lango and Teso all significantly reduce the probability of a household being in chronic poverty. On the other hand, share of other adults with some

[10]. The Ordered Logit model results are not presented here but available upon request.

primary education, household size and share of children, distance to input market, distance to trunk road, and living in Karamoja sub-region, all significantly increase the likelihood of a household being in chronic poverty. Yet, the marginal effects of these same variables are significant and have the opposite sign on the likelihood of a household being in transient poverty or non-poor.

As argued by McCulloch and Baulch (1998), the Ordered Logit estimates are only as useful as in understanding the relative influence of different characteristics on poverty state. It falls short in identifying the characteristics that are more prevalent among each poverty state. Hence the use of the Multinomial Logit model and the results are presented in Table 8. Marginal effects are presented showing the impact of one unit change in the independent variable on the probability of being in one of the three poverty states. They show characteristics that are more prevalent among chronically poor households than transiently poor households. Model estimates are presented for the entire NUSAF region in Table 8 and those at sub-regional levels are not presented but available upon request. Overall, there are some consistent results at both levels and inconsistencies are highlighted in the text where they appear.

Household demographics: Larger household size has a significant and positive effect on the likelihood that a household is chronically poor, while smaller household size significantly increases on the likelihood that a household is non-poor. While household size does not significantly affect transiently poor at NUSAF region level, it significantly increases the likelihood of being transiently poor in the sub-regions of Lango and Acholi, and the opposite significant sign is noted for Karamoja sub-region. The finding for Karamoja could be picking up the livelihood strategies in this sub-region - with larger households being beneficial for reducing a household vulnerability to poverty. In addition, the age and sex composition of household characteristics exerts further influence on the likelihood of being in any poverty state. The negative and significant impact of share of adult females and elderly persons on the likelihood of a household being in chronic poverty can be explained by the direct contribution of their labour input to household production and income relative to their male counterparts. The same variables are significant for transient poverty but of opposite sign. Notably, the marginal effect is higher for chronic than transient poverty. In contrast, the share of children significantly increases a household likelihood to be chronically poor.

Probably this finding reflects the fact that these children are a burden for households. Yet, the share of adult females increases the likelihood of a household being transiently poor.

Other socio-demographic characteristics do matter for the chronically poor households. Relative to male headed households, households with female heads who are married are significantly less likely to be in chronic poverty – a result that is contrary to findings in development economics literature that argues that female headed households are likely to be chronically poor than their male counterparts (CPRC 2005). This is true at sub-regional level except for Lango. In Lango sub-region, probability of being chronically poor significantly reduces for those households with female heads relative to their male headed counterparts. This is a significant finding contrary to that in CPRC (2005). Regardless of poverty state, the age of the household head does not significantly influence the probability of being in any state. This finding corroborates with that of Lawson *et al.* (2004). In contrast, estimates at sub-regional level suggest that households with older household heads are more likely to remain in poverty and significantly less vulnerable to poverty in Karamoja.

Table 8: Multinominal Logit model estimates

Variable	Chronic poor				Transient poor				Non-poor		
	dy/dx		Se		dy/dx		Se		dy/dx		Se
Log(Age of household head)	0.019		0.048		-0.042		0.045		0.023		0.037
Head's years of schooling	-0.028	***	0.005		0.009	*	0.005		0.019	***	0.003
Marital status by gender (ref: male headed households):											
- Single female headed	-0.048		0.039		0.068		0.043		-0.020		0.030
- Married female headed	-0.097	**	0.043		0.019		0.044		0.079	**	0.040
Share of other adult members (ref: no education)											
- With some primary education	0.127	**	0.059		-0.064		0.058		-0.063		0.046
- With primary education	0.000		0.115		-0.017		0.104		0.017		0.071
-With some secondary educ.	-0.037		0.134		-0.072		0.121		0.109		0.084
- With secondary educ. Plus	-0.566	**	0.257		0.121		0.207		0.445	***	0.116
Share of literate adults	-0.104	**	0.046		0.098	**	0.050		0.006		0.037
Household size	0.036	***	0.007		0.007		0.008		-0.043	***	0.008
Demographic composition- share (ref adult males 15-59 yrs):											
- Members <6 yrs	0.248	**	0.099		-0.151		0.095		-0.098		0.073
- Members 6-9yrs	0.209	*	0.118		0.046		0.122		-0.255		0.095
- Members 10-14yrs	0.216	*	0.126		-0.193	*	0.117		-0.023		0.091
- Adult females 15-59 yrs	-0.393	***	0.104		0.315	***	0.101		0.078		0.068
- Elderly persons 60+	-0.261	***	0.099		0.183	*	0.102		0.078		0.073
Share of adults with ill-health	-0.052		0.036		-0.006		0.034		0.058	**	0.026
Death of member dummy	-0.045		0.040		0.001		0.042		0.044		0.031
Log(Land size, acres)	-0.013		0.018		0.006		0.017		0.007		0.013
Log(value of livestock & poultry)	-0.002		0.003		-0.004		0.003		0.006	***	0.002
Log(value of farm equipment)	-0.015	***	0.005		0.012	**	0.005		0.004		0.004
Livelihood of adults (ref. non-working adult members):											
- Share in agriculture	0.027		0.046		-0.033		0.043		0.006		0.034
- Share in construction	-0.114	*	0.067		-0.007		0.068		0.121	**	0.059
- Share in trade	-0.230	*	0.130		0.105		0.122		0.124	*	0.068
- Share in other sectors	-0.131		0.112		-0.089		0.104		0.220	***	0.057
Log(distance to input market)	0.016		0.010		0.000		0.009		-0.016	**	0.006
Log(distance to feeder roads)	-0.004		0.008		0.019	***	0.006		-0.016	**	0.007
Log(distance to police station)	0.003		0.009		0.009		0.007		-0.012	*	0.007
Log(distance to primary school)	0.007		0.008		0.006		0.007		-0.012	*	0.007
Log(distance to health centre)	0.002		0.008		-0.005		0.006		0.004		0.006
Log(distance to trunk)	0.011	**	0.006		-0.004		0.005		-0.007		0.005
Cattle rustling dummy	0.063		0.040		-0.051		0.033		-0.013		0.033
Presence of NGO within 5km	0.055		0.049		-0.067	*	0.037		0.012		0.030
Urban dummy	-0.190	***	0.044		-0.011		0.045		0.201	***	0.041
Sub-region dummies (ref: West Nile):											
- Acholi	-0.054		0.043		0.099	**	0.041		-0.036		0.030
- Lango	-0.101	***	0.036		0.070	**	0.035		0.031		0.030
- Teso	-0.089	***	0.031		0.061	**	0.029		0.028		0.025
- Karamoja	0.142	***	0.054		-0.015		0.050		-0.126	***	0.023

Source: Author's calculations based on NUS 2004 and 2008.
Notes: *** p<0.01, ** p<0.05, * p<0.1. Coefficients and standard errors adjusted for sampling weights and robust to heteroskedasticity.

Education: Presence of a better educated household head significantly reduces the likelihood of a household that is chronically poor; and increases the likelihood of being transiently poor. It is notable that the marginal effects of the household head's education are greater for chronic poverty than for transient poverty. Increasing education of the head by one year decreases the likelihood of being chronically poor than increases the probability of being transiently poor. This finding highlights the strong role of education in raising welfare of households in the long-term. The results are mixed for education of other adult members after controlling for the years of education of the household head. For example, increasing the share of other adult members with some primary education increases the probability of chronic poverty whereas increasing the share of members with secondary or higher education reduces the likelihood of being chronically poor. By contrast, education of other adult members does not significantly influence the probability of being transiently poor beyond education of the household head. Share of other adult members with primary or some secondary education does not show any significant association with either chronic or transient poverty. Among the chronically poor households education of the household head as well as educational attainment of other adult members matters.

Given the low education attained in the region, it was necessary to check whether or not literacy has an additional impact. Evidently, increasing the share of literate members is likely to significantly reduce the likelihood of a household being chronically poor; and more likely to increase the probability of transient poverty. The likelihood of chronic poverty is more strongly related to adult literacy relative to higher education attainment of the household head. This finding suggests that adult literacy programme given the low education levels would go a long way in addressing chronic poverty in the region. The findings of education are consistent with that of Bird (2009) that education helps to prevent declines into chronic poverty.

Shocks: There is no doubt that mortality yields increases household vulnerability especially if the deceased was a productive adult household member (Yamano and Jayne, 2004). The results on the incidence of death dummy are surprisingly contrary to the expectations. There is no statistical evidence that households experiencing a death in the past 12 months prior to the survey in 2004 were more likely to be chronically or transiently poor. Put

differently, loss of a household member does not exacerbate poverty holding all other factors constant. The position in the family might be playing a part here. For example, the chronically poor households were more likely to report a child than adult death. At sub-regional level, households in the sub-regions of Lango and West Nile with a death incidence in 2004 are significantly more likely to be transiently poor.

Other shocks to households do matter. Households reporting ill-health of members that sought medical attention are significantly more likely to be never poor and significantly less likely to be chronically poor. In contrast, the likelihood of being chronically poor decreases for households in Teso and West Nile sub-regions. The opposite is observed in Acholi for the chronically poor households. Incidence of cattle rustling in the communities significantly increased the likelihood that a household remains chronically poor during the four years. There is no statistical significance with transient poverty. In contrast, in Acholi sub-region cattle rustling significantly increases a household likelihood of being in chronic poverty but significantly reduced the probability of being in transient poverty. In Lango sub-region cattle rustling significantly reduces the probability of a household being chronically or transiently poor; whereas it significantly increases a household likelihood to be non-poor in Teso sub-region.

Livelihoods: The livelihood strategies influence which poverty state a given households is in, a finding consistent with that of Lawson *et al.* (2004). It is evident that livelihood is crucial for combating chronic poverty but not transient poverty after controlling for all other factors. Relative to not working, a household with a higher proportion of adult members in the sectors of construction and manufacturing, and trade is less likely to be in chronic poverty, but significantly more likely to be non-poor. At aggregate level, there is no statistical evidence on the transiently poor. In Lango sub-region, increasing share of adults engaged in trade or other sectors significantly reduces the probability of a household being in chronic poverty but significantly increases the likelihood of being vulnerable to poverty. Noteworthy is the absence of statistical significance on the proportion of adult members in agriculture despite the high concentration of households in this sector. This corroborates with the findings in Lawson *et al.* (2004). This seems to suggest that job opportunities created outside agriculture might address the chronic poverty issues in the region.

Physical assets: The impact of household wealth yields mixed results. While value of livestock/poultry assets held in 2004 significantly increases the probability of a household being non-poor, no significant association is observed for either chronic or transient poverty. However, the higher value of livestock assets significantly reduces chronic poverty in Teso sub-region. Although, the higher value of farm equipment reduces the likelihood that a household is chronically poor but increases the likelihood that a household is transiently poor. Land size reduces the probability of a household being chronically poor though the effect is not statistically significant. The households in Lango sub-region with larger land size are less likely to be transiently poor, whereas those in Teso sub-region are significantly more likely to be transiently poor. The finding for households in Teso sub-region is consistent with the evidence by Haddad and Ahmed (2003) in Egypt. Possibly increasing land size might expose the households to higher income shocks.

Community infrastructure: The infrastructure gaps have been identified among the key constraints to improving agricultural productivity and in turn sustainable growth in Uganda. Compared to the rest of the country, the Northern region has the least developed infrastructure. The marginal effect of infrastructure differs by type and poverty state. The results confirm that bringing infrastructure especially input markets and trunk roads closer to the communities will reduce the likelihood that a household is chronically poor. This can perhaps be explained by the fact that bringing such infrastructure close to households might reduce on the transaction costs and bring better jobs opportunities to people. There is no statistical evidence to support that these same infrastructure reduce transient poverty. This is not surprising given the long-term nature of infrastructure investments. In the sub-region of West Nile improving access to feeder roads significantly reduces a household's likelihood to be in chronic poverty but significantly increases transient poverty. Distance to health centre is not a statistically significant determinant of either chronic or transient poverty.

The presence of NGO in the NUSAF region has grown over time. Presence of NGO assisting IDPs/Abductees in communities within 5km reduces the likelihood of a household being in chronic or transient poverty. However, the impact is only significantly negative for transient poverty. In terms of geographical location, the omitted sub-region is West Nile. It is evident that households in Karamoja sub-region are significantly more likely to be chronically poor and significantly less likely to be non-poor. On the other hand, households in Lango and

Teso are less likely to be in chronic poverty but significantly vulnerable to poverty. It also the likelihood to remain in chronic poverty is significantly higher for households residing in rural areas than in rural areas.

Despite methodological differences as alluded to earlier, the factors distinguishing chronic from transient poverty are largely in line with the previous studies on Uganda. All these studies identify location of household, household size and composition, and characteristics of the household head as key determinants. More importantly, this paper's findings confirm that the determinants of chronic and transient poverty are quite different and that there are variations observed at sub-regional level. This calls for targeted policy interventions and different public support to address each poverty state.

4.0 CONCLUSIONS AND IMPLICATIONS FOR POLICY

Even with the absence of more recent panel data at national level, the findings based on a two-period 3,572 panel households in the NUSAF region interviewed in 2004 and again in 2008 do provide new evidence of chronic poverty in Uganda. During this period, households in this region experienced strong growth in consumption and in turn poverty reduction although the vast majority remain persistently poor. Four in every ten households are living in chronic poverty and of these about 45 percent in severe chronic poverty. Going by the estimates based on UNPS of 1992/99, there seem to be an increasing trend in the number of persons living in chronic poverty in this part of the country. On the other hand, during 2004 to 2008 period, households registered more exits from poverty than entries into poverty this contrasts the findings of Lawson *et al.* (2004) based on the 1992-1999 panel data. This partly explains the observed significant poverty reduction among panel households.

The region's poverty is described more as chronic than transient. However, the aggregated picture masks significant differences at sub-regional level. The picture at the aggregate level mirrors itself in the sub-regions of West Nile and Karamoja. The reverse is observed in Lango sub-region and chronic poverty is as equally prevalent as transient poverty in Acholi and Teso sub-regions. The econometric results have also demonstrated that households living in Karamoja sub-region are more likely to be chronically poor and less likely to be non-poor. Sub-regions with higher incidence of chronic poverty need more growth enhancing policies as opposed to income smoothing policies that address transient poverty. Thus government anti-poverty interventions should address these dynamic features of poverty.

Drawing on previous poverty dynamics studies on Uganda, the findings reveal that the determinants of chronic and transient poverty are quite different and that initial conditions do matter. Households with smaller family size, better educated members, higher access to non-agricultural activities, higher value livestock/poultry, and better access to infrastructure especially input markets and trunk roads are less likely to be chronically poor. However, the same factors seem to matter little for addressing transient poverty. Household vulnerability to poverty increases with distance to feeder roads, value of assets and significantly reduces due to the presence of NGO in the communities. Sub-regional estimates also showed that a number of initial conditions to significantly influence chronic poverty with noticeable spatial differences. Yet, government poverty interventions in the region continue to treat the poor

as a homogenous group. The paper findings have refuted this. In other words, there is need to have more targeted interventions and public support to fight against chronic poverty compared to those meant to mitigate transient poverty. Similar to other studies, the paper confirms that households in chronic poverty suffer from multidimensional deprivation including low income, lack of access to non-agricultural employment, low education levels, low literacy rates, low possession of assets, low access to ICT, and lack of access to input markets and trunk roads.

The findings from this paper have a number of important implications for sustainable poverty interventions in the NUSAF region and specifically for informing the refinement of the existing government anti-poverty interventions in the region. Chronic poverty has to be considered as a distinct dimension of poverty. The interventions need to encompass growth options and targeted interventions. More specifically, the paper makes the following policy conclusions:

a. Ensuring peace in the region is a necessary condition for effective implementation of government programmes. This should go hand in hand with putting an end to cattle rustling in the region;

b. Ensuring that children especially girls start school on time and complete the education cycle would go a long way in addressing the high fertility rate and in turn reduce the domestic burden brought about by many children among the chronically poor households;

c. Given the low educational attainment adult literacy programs and skills-based programmes targeting the youth (as highlighted also in Bidwell *et al.* 2008) should be put in place where they do not exist; and where they already exist, there is need to ensure that there are functional;

d. Significant majority of the households in NUSAF region earn their livelihoods from agriculture though not found to be an important factor for distinguishing between chronic and transient poverty. In this case with 8 in every 10 households in chronic poverty depending on agriculture as a main source of employment and income, investing in agriculture would be the first step in reducing chronic poverty. Given the prevailing peace in the region, government should put in place policies and

interventions that stimulate the sector and promote its transformation to a productive one. For instance, addressing the infrastructure gaps (see (g) below) that are necessary for promoting agricultural productivity in the region;

e. The large role of agriculture as a source of livelihood also shows a greater need to spur industrial development in the region and that continued reliance on subsistence agriculture might not address chronic poverty;

f. Creation and promotion of employment outside the agricultural sector. For instance, creation of employment through public works as highlighted in the PRDP will lead to utilisation of their most abundant asset, labour. The other option would be to facilitate and attract the private sector in the region with the aim of improving labour market outcomes. There is, therefore, need to put in place the right incentives and conducive business environment so as to attract the private players in this part of the country. This will indirectly create employment opportunities;

g. Infrastructure especially trunk roads and markets for inputs do matter for households living in chronic poverty. This is expected to lead to reduction in transaction costs and in turn increase their participation in the growth process. Thus interventions towards fighting poverty should be directed more intensively towards households in remote, disadvantaged areas or households living far from such infrastructure. While the NDP and the PRDP in particular highlight the importance of building feeder roads, the paper argues for critical infrastructure with greater impact on chronic poverty;

h. The anti-poverty policies/programmes/interventions in Uganda have centred on increasing public investment in health and education, and geographically targeted interventions such as PRDP and NUSAF II among others. Time has proved that some groups always miss out on these government initiatives. These initiatives prioritise the poorest/lagging regions; however, this has proved to be insufficient to address the plight of the chronically poor. The findings have implications for these current efforts to fight against poverty especially in the NUSAF region. Universal policies are not enough to address the significant sub-regional differentials in this post-conflict region. Given the persistence of poverty in the region, these efforts need to be targeted to address the dynamic nature of poverty. Otherwise, addressing

vulnerabilities as talked about in the PRDP might not address chronic poverty. There is evidence that blanket interventions targeting the poor as a group have not reached the chronically poor and/or addressed the high mobility into and out of poverty as well. Ignoring the dynamic view of poverty in this region, therefore, might not lead to the expected results. The government has to design strategies that are more conducive to growth with equity; and

i. The PRDP mentions the vulnerable groups in the region and proposes ways of reaching these groups. In addition, the Ministry of Labour, Gender and Social Development (MoLGSD) with support from development partners is in the process of implementing a cash transfer scheme targeting some districts in the region. Yet, the findings do suggest that the share of these vulnerable groups increased significantly over the panel period. At individual level, these vulnerable groups are more likely to be chronically poor. These initiatives should recognise and address the fact that the dynamic nature of poverty varies significantly across sub-regions. In this case the scheme is less likely to have a dent on chronic poverty in Karamoja sub-region.

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Appendix 1: Selected characteristics by poverty trajectory

Characteristic	Chronic poverty	Moved out of poverty	Slipped into poverty	Never poor	All
Education:					
Gross enrolment rate at primary level, 2004	112.6	135.4	120.4	127.7	121.8
Gross enrolment rate at primary level, 2008	121.9	129.3	128.5	128.3	125.4
Net enrolment rate at primary level, 2004	73.1	82.8	78.0	85.4	78.1
Net enrolment rate at primary level, 2008	74.9	81.6	81.2	82.7	78.5
Stock of education for other adults, 2004	8.09	11.81	9.54	13.84	10.52
Stock of education for other adults, 2008	9.86	11.09	11.78	15.57	11.72
Health:					
Adult members sick, 2004	0.52	0.63	0.47	0.59	0.56
Adult members sick, 2008	0.52	0.68	0.55	0.56	0.57
Household size and composition:					
Household size, 2004	6.09	5.87	4.58	4.52	5.49
Household size, 2008	6.52	5.31	5.97	5.02	5.81
Children <15 years, 2004	***3.49***	3.03	2.38	2.15	2.93
Children <15 years, 2008	***3.66***	2.79	3.27	2.46	3.12
Children <=5 years, 2004	1.43	1.16	1.14	0.87	1.20
Children <=5 years, 2008	1.30	1.08	1.39	0.95	1.18
Children 6-9 years, 2004	0.98	***0.88***	0.61	0.54	0.81
Children 6-9 years, 2008	1.08	***0.77***	0.88	0.71	0.89
Children 10-14 years, 2004	1.08	0.99	0.63	0.74	0.92
Children 10-14 years, 2008	1.29	0.94	1.00	0.80	1.05
Adults 15-59 years, 2004	2.37	2.56	2.04	2.11	2.31
Adults 15-59 years, 2008	2.58	2.19	2.45	2.25	2.39
Adult females 15-59 years, 2004	1.25	1.35	1.15	1.12	1.23
Adult females 15-59 years, 2008	1.35	1.19	1.31	1.23	1.28
Adult males 15-59 years, 2004	1.12	1.20	0.89	0.98	1.08
Adult males 15-59 years, 2008	1.23	1.00	1.14	1.02	1.11
Elderly persons 60+ years, 2004	0.24	0.29	0.16	0.26	0.24
Elderly persons 60+ years, 2008	0.28	0.33	0.25	0.32	0.30
Share of adult earners, 2004	0.74	0.72	0.75	0.77	0.74
Share of adult earners, 2008	0.82	0.81	0.85	0.81	0.82
Share of adult female earners, 2004	0.41	0.42	0.43	0.41	0.42
Share of adult female earners, 2008	0.47	0.48	0.49	0.45	0.47

Characteristic	Chronic poverty	Moved out of poverty	Slipped into poverty	Never poor	All
Share of adult male earners, 2004	0.32	0.30	0.32	0.35	0.32
Share of adult male earners, 2008	0.35	0.33	0.37	0.35	0.35
Main activity status by economic sector (adults only):					
Share in agricultural sector, 2004	0.65	0.61	0.59	0.50	0.60
Share in agricultural sector, 2008	0.75	0.69	0.73	0.55	0.69
Share in construction and manufacturing sector, 2004	0.05	0.05	0.06	0.07	0.06
Share in construction and manufacturing sector, 2008	0.03	0.04	0.04	0.04	0.03
Share in trade sector, 2004	0.02	0.03	0.04	0.05	0.03
Share in trade sector, 2008	0.02	0.04	0.03	0.07	0.04
Share in not working adults, 2004	0.26	0.28	0.25	0.23	0.26
Share in not working adults, 2008	0.18	0.19	0.14	0.19	0.18
Share in other sectors, 2004	0.02	0.03	0.05	0.14	0.05
Share in other sectors, 2008	0.02	0.05	0.05	0.14	0.06
Adult earners dependency:					
Children <14 years: adult ratio, 2004	1.87	1.73	1.32	1.33	1.64
Children <14 years: adult ratio, 2008	1.85	1.49	1.63	1.34	1.62
Adult earners : adult ratio, 2004	0.71	0.68	0.70	0.70	0.70
Adult earners : adult ratio, 2008	0.78	0.72	0.79	0.73	0.76
Main source of income:					
Share with agriculture as main source, 2004	0.80	***0.75***	0.76	0.59	0.73
Share with agriculture as main source, 2008	0.84	***0.81***	0.80	0.60	0.77
Share with self employment in non-agriculture, 2004	0.07	0.08	0.07	0.14	0.09
Share with self employment in non-agriculture, 2008	0.08	0.09	0.09	0.15	0.10
Share with causal wage employment , 2004	0.02	0.02	0.03	0.05	0.03
Share with causal wage employment , 2008	0.03	0.04	0.02	0.05	0.03
Share with permanent wage employment, 2004	0.01	0.03	0.03	0.13	0.05
Share with permanent wage employment, 2008	0.01	0.03	0.04	0.13	0.05
Share with transfers/remittances, 2004	0.10	0.11	0.11	0.07	0.10
Share with transfers/remittances, 2008	0.04	0.03	0.04	0.05	0.04
Share with others, 2004	0.00	0.00	0.01	0.02	0.01
Share with others, 2008	0.01	0.01	0.01	0.02	0.01

Source: Author's calculations based the NUS 2004 and 2008.
Notes: Shaded estimated indicate significant at 5% and estimates in italics indicate significant change at 10%.

Appendix 2: Welfare indicators by poverty trajectory

	Chronic poverty	Moved out of poverty	Slipped into poverty	Non-poor	All
Had a single meal, daily					
2008	29.7	19.7	23.9	13.8	22.8
2004	26.5	22.9	15.3	13.4	21.2
Had fish during last 7 days					
2008	40.4	51.2	42.3	61.8	48.2
2004	46.4	44.0	53.4	64.0	50.7
Had meat during last 7 days					
2008	25.0	45.7	20.2	58.7	37.3
2004	24.9	24.4	40.0	55.6	33.6
Had milk during last 7 days					
2008	10.9	18.6	10.1	25.0	15.9
2004	12.3	10.7	19.9	28.1	16.4
At least 2 sets of clothes					
2008	65.8	78.6	78.1	90.6	76.1
2004	56.1	64.8	72.7	84.1	66.7
At least a pair of shoes					
2008	10.5	30.8	15.0	53.2	25.8
2004	3.9	11.5	18.0	43.1	16.5
Borrowed salt					
2008	29.3	22.9	30.6	22.5	26.3
2004	35.1	35.6	34.4	25.3	32.9

Source: Author's calculations based on NUS Panel data 2004 and 2008.
Notes: Shaded estimated indicate significant at 5% and estimates in italics indicate significant change at 10%.

Appendix 3: Incidence of household ownership of assets by poverty trajectory, retrospectively

Asset item	Chronic poverty		Moved out of poverty		Slipped into poverty		Never poor		All	
	2004	2008	2004	2008	2004	2008	2004	2008	2004	2008
Oxen	10.0	13.0	10.5	18.6	11.6	11.4	12.3	14.5	10.9	14.5
Cattle	21.0	26.3	19.6	28.6	23.0	22.5	26.5	26.3	22.2	26.4
Goats	44.7	46.1	45.6	50.7	41.5	44.6	43.1	45.7	44.2	46.9
Sheep	12.9	13.0	10.6	14.2	10.0	10.5	7.5	11.4	10.7	12.7
Pig	10.4	11.2	13.2	13.7	11.6	10.9	11.6	12.4	11.5	12.1
Poultry	50.2	55.2	48.4	63.1	52.0	56.5	53.7	59.1	50.8	58.2
Plough	10.7	11.4	12.6	16.8	7.4	9.0	12.3	14.7	11.2	13.2
Hoe	92.0	96.4	92.8	96.1	89.4	94.4	86.3	89.7	90.6	94.6
Motorcycle	0.2	0.5	0.3	2.0	0.5	1.1	1.7	4.9	0.6	2.0
Bicycle	36.0	39.5	46.3	57.4	44.3	46.6	49.9	55.6	42.8	48.5
Irrigated fields	0.7	1.0	2.0	1.0	1.6	0.7	1.2	0.4	1.3	0.8
Granaries	26.7	26.5	24.4	25.4	23.0	18.5	21.1	16.1	24.4	22.9
Building	87.0	92.6	82.9	93.2	83.2	93.1	79.5	86.5	83.8	91.4
Television	0.6	0.1	0.5	0.1	0.2	0.0	2.7	7.2	1.0	1.7
Radio	24.5	30.4	31.3	49.1	37.3	40.2	48.3	58.2	33.2	42.6
Cassette player	3.9	1.2	5.7	4.4	6.7	2.1	17.0	15.1	7.8	5.3
Mobile phone	0.7	7.9	1.1	20.0	2.3	12.8	11.3	41.4	3.4	19.3

Appendix 4: Household's access to community infrastructure, %

Infrastructure	Chronic poverty	Moved out of poverty	Slipped into poverty	Never poor	All
Input market within 5km, 2004	33.0	38.4	41.1	56.8	40.8
Input market within 5km, 2008	43.8	50.9	43.9	65.6	50.6
A feeder road/rural access road within 1 km, 2004	77.6	77.6	78.2	87.5	80.0
A feeder road/rural access road within 1 km, 2008	79.1	78.8	78.3	83.1	79.8
Police post within 5km, 2004	42.4	48.5	47.9	63.1	49.4
Police post within 5km, 2008	68.0	70.7	66.1	79.4	71.1
Army station within 10km, 2004	63.2	63.1	62.0	69.0	64.4
Army station within 10km, 2008	48.4	46.5	46.5	54.6	49.1
Primary school with 3km, 2004	95.5	96.3	95.5	97.3	96.1
Primary school with 3km, 2008	94.4	94.7	94.8	96.4	95.0
Secondary school with 10km, 2004	79.1	86.6	87.5	88.7	84.2
Secondary school with 10km, 2008	82.3	88.4	88.5	91.6	86.7
Clinic/health centre within 3km, 2004	48.6	53.0	52.7	59.1	52.6
Clinic/health centre within 3km, 2008	62.1	66.8	68.5	74.4	66.9
Hospital within 10km, 2004	30.3	35.3	32.2	48.2	35.9
Hospital within 10km, 2008	31.8	36.1	35.0	48.0	37.0
Trunk road with 10km, 2004	77.4	***81.3***	77.1	88.0	80.8
Trunk road with 10km, 2008	82.8	***88.1***	87.8	92.7	87.0
Safe drinking water within 1km, 2004	78.3	83.8	82.2	83.6	81.4
Safe drinking water within 1km, 2008	73.3	74.3	78.0	82.5	76.3
Has access to safe drinking water, 2004	69.0	71.3	76.7	83.3	73.8
Has access to safe drinking water, 2008	77.6	80.1	80.7	89.1	81.3

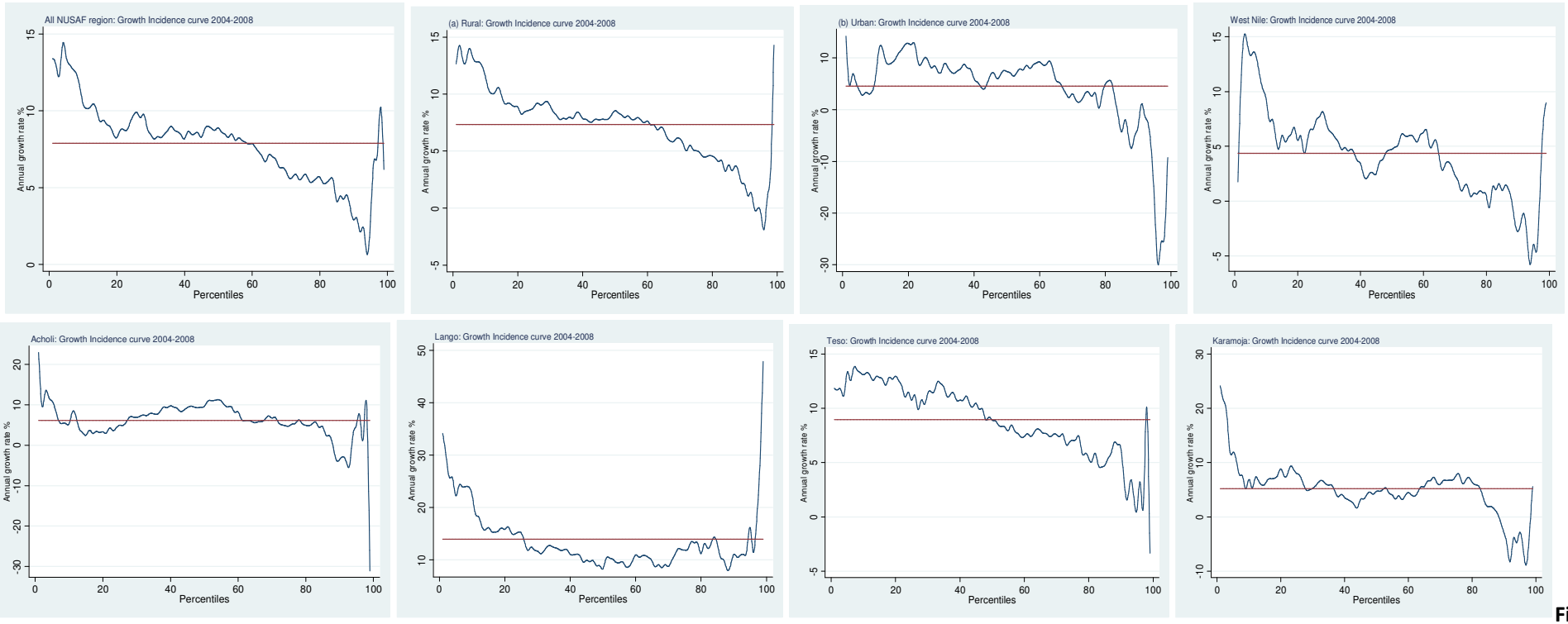
Source: Author's calculations based on NUS panel 2004 and 2008.
Notes: Shaded estimated indicate significant at 5% and estimates in italics indicate significant change at 10%.

Table A 1: Ordered Logit model results

VARIABLES	Chronic poor		Transient poor		Non-poor	
	dy/dx	*se*	dy/dx	*se*	dy/dx	*se*
Log(Age of household head)	-0.0200	0.0433	0.00691	0.0150	0.0131	0.0282
Head's years of schooling	-0.0273***	0.00394	0.00940***	0.00174	0.0179***	0.00251
Marital status by gender (ref: male headed households):						
- Single female headed	0.121**	0.0513	-0.0417**	0.0184	-0.0792**	0.0335
- Married female headed	0.0208	0.0946	-0.00718	0.0327	-0.0136	0.0619
Share of other adult members:	-0.0696	0.105	0.0240	0.0363	0.0456	0.0692
- With some primary education	-0.491***	0.118	0.169***	0.0416	0.321***	0.0803
- With primary education	-0.0758*	0.0406	0.0261*	0.0142	0.0497*	0.0267
-With some secondary educ.						
- With secondary educ. Plus	-0.0291	0.0331	0.00926	0.00992	0.0198	0.0233
Share of literate adults	-0.105***	0.0363	0.0228***	0.00471	0.0827**	0.0337
Household size	0.0386***	0.00688	-0.0133***	0.00270	-0.0253***	0.00457
Demographic composition- share (ref adult males 15-59 yrs):						
- Members <6 yrs	0.255***	0.0884	-0.0880***	0.0317	-0.167***	0.0582
- Members 6-9yrs	0.314***	0.105	-0.108***	0.0378	-0.205***	0.0686
- Members 10-14yrs	0.233**	0.111	-0.0805**	0.0396	-0.153**	0.0726
- Adult females 15-59 yrs	-0.191**	0.0841	0.0657**	0.0298	0.125**	0.0552
- Elderly persons 60+	-0.163*	0.0853	0.0562*	0.0296	0.107*	0.0562
Share of adults with ill-health	-0.0625**	0.0314	0.0216**	0.0108	0.0410*	0.0209
Death of member dummy	-0.0459	0.0313	0.0135*	0.00778	0.0325	0.0237
Log(Land size, acres)	-0.0106	0.0148	0.00366	0.00509	0.00695	0.00969
Log(value of livestock & poultry)	-0.00410*	0.00244	0.00142*	0.000847	0.00269*	0.00161
Log(value of farm equipment)	-0.0101**	0.00407	0.00348**	0.00146	0.00661**	0.00266
Livelihood of adults (ref. non-working adult members):						
- Share in agriculture	0.00909	0.0410	-0.00314	0.0141	-0.00596	0.0269
- Share in construction	-0.120*	0.0667	0.0414*	0.0235	0.0787*	0.0437
- Share in trade	-0.181*	0.0923	0.0623*	0.0328	0.118**	0.0602
- Share in other sectors	-0.246***	0.0804	0.0848***	0.0291	0.161***	0.0527
Log(distance to input market)	0.0202**	0.00827	-0.00695**	0.00295	-0.0132**	0.00541
Log(distance to feeder roads)	0.00509	0.00718	-0.00176	0.00248	-0.00333	0.00471
Log(distance to police station)	0.00665	0.00800	-0.00229	0.00279	-0.00436	0.00523
Log(distance to primary school)	0.00894	0.00757	-0.00308	0.00259	-0.00586	0.00500
Log(distance to health centre)	0.00136	0.00692	-0.000470	0.00239	-0.000892	0.00453
Log(distance to trunk)	0.0103*	0.00556	-0.00354*	0.00197	-0.00672*	0.00362
Cattle rustling dummy	0.0380	0.0401	-0.0143	0.0163	-0.0238	0.0238
Presence of NGO within 5km	0.0159	0.0405	-0.00570	0.0152	-0.0102	0.0253
Rural dummy	-0.184***	0.0314	0.0177	0.0107	0.166***	0.0394
Sub-region dummies (ref: West Nile):						
- Acholi	-0.0172	0.0385	0.00566	0.0122	0.0115	0.0264
- Lango	-0.0692**	0.0328	0.0200**	0.00787	0.0492*	0.0254
- Teso	-0.0729***	0.0278	0.0212***	0.00734	0.0517**	0.0209
- Karamoja	0.183***	0.0524	-0.0902***	0.0317	-0.0924***	0.0214
Observations	3569		3569		3569	

Source: Author's calculations based on NUS 2004 and 2008.
Notes: *** p<0.01, ** p<0.05, * p<0.1

Figure 1: Growth incidence curves by location



Fig

Figure 2: Growth incidence curves by poverty trajectory