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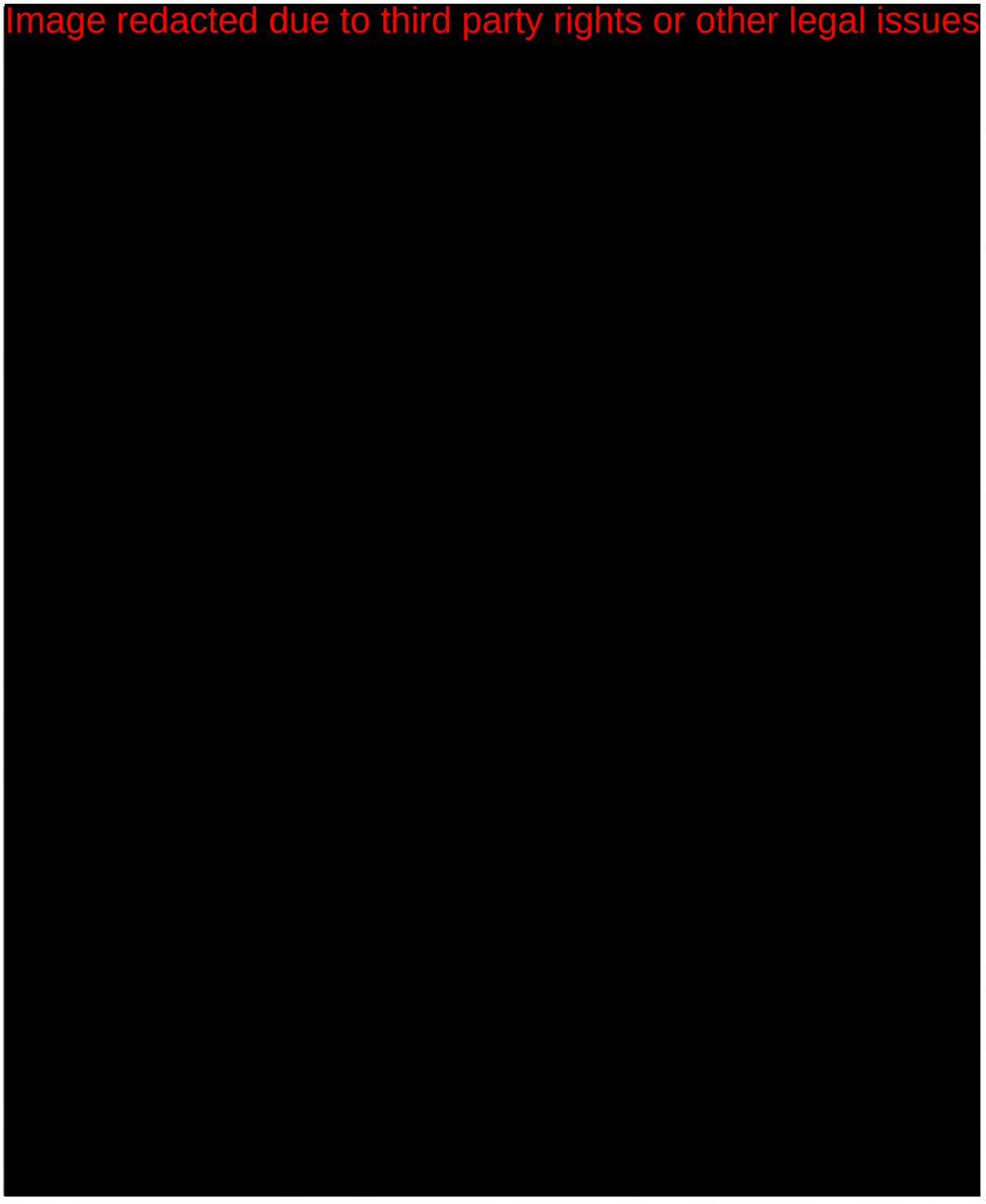
**Figure i: Poverty Map of Ghana in 2000**




Source: Coulombe and Wodon (2007)

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# ABSTRACT

Ghana has seen notable poverty reduction alongside improvements in school participation since 1991. This thesis explores the patterns among descriptive indicators and uses regression analysis to examine possible causal relationships with special reference to the role of education in determining welfare and its reciprocal, the role of welfare and other aspects of economic privilege in the determination of school attendance and progression. The study follows a mixed-methods design, following quantitative analysis at the national level with a mixed methods sub-study in a deprived district of Ghana.

The primary quantitative study begins by reviewing the literature on modelling of the household consumption function as well as on modelling schooling decisions based on the household production function and considers these relationships in terms of a system of co-determining factors at individual, household and contextual levels. Attention is then given to important methodological issues related to the modelling approach. Two groups of models are estimated using data from the Ghana Living Standards Surveys and findings are presented. The results suggest that education levels play an important role in determining household welfare and that, for higher levels of education; these effects are considerably larger and possibly increasing over time.

Educational expansion has, however, meant that access to the benefits from these effects has widened somewhat, although primarily at lower levels of access. Demographic change has also played an important role in welfare improvements. In terms of absolute numbers, access to schooling in Ghana has expanded dramatically although rates of completion and of drop-out have not improved and there appears to be a worsening of age-appropriate completion rates. Nonetheless, the first half of the period since 1991 saw substantial increases in rates of school attendance at the basic education level. This growth appears to have been driven by narrowing regional differentials, increasing welfare, urbanisation, improving gender equity, smaller and less dependent households and a reduction in the number of children involved in child labour. It is in relation to progression towards higher levels of education that more significant inequity emerges and in 2006 completion of lower secondary education in Ghana remained the preserve of children in areas and households of relative economic privilege.

To explore issues of access in more detail and in context, an interview-based study was conducted in Savelugu-Nanton District, following quantitative analysis using regional and district-level data. Exploratory interviews with education professionals identified child-fosterage and migration by youths into *kayaye* (head-porterage) as important inhibitors of access. These are considered in detail through two further sets of interviews with household caregivers and migrant workers, supported by quantitative analysis. Findings show that, fosterage, primarily motivated by cultural traditions of kinship obligation, is related to considerable educational disadvantage which, especially in the case of girls who face the additional pressure to accumulate items required for marriage, in turn is linked to migration South into menial labour. Despite recent policies to eliminate costs of schooling, low incomes in the district mean that schooling remains relatively costly, and household decision-making continues to exclude a notable portion of the child population; among whom many are fostered children.

# ACKNOWLEDGEMENTS

I am especially grateful to the ESRC (Economic and Social Research Council) for their support throughout my PhD programme. I would like to thank my supervisors Professor Angela Little and Dr. James Brown. Their timely and constructive feedback and support were central to the progress of this work. I am I am also grateful to the CREATE (Consortium for Research on Educational Access, Transitions and Equity) team in Cape Coast, Ghana, to staff at ISSER (Institute for Statistical, Social and Economic Research) in Accra and to Professor Geeta Kingdon, Professor Anna Vignoles and Dr. Kwame Akyeampong for their comments on early versions of the study. I am grateful to colleagues in Ghana who helped with interviews, especially translation, particularly Mustafa Allason. The work also benefitted greatly from discussions with Mahama Abukari, a Dagomba tribal chief and employee of the Savelugu-Nanton District Education office.

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| | |
|---|---|
| ADP | Accelerated Development Plan |
| BECE | Basic Education Certificate Examination |
| BERA | British Education Research Association |
| CCU | Cape Coast University |
| ComSS | Community and Schools Survey |
| CREATE | Consortium for Research on Educational Access, Transitions and Equity |
| CRS | Catholic Relief Services |
| CWIQ | Core Welfare Indicators Questionnaire |
| DA | District Administration |
| Deffs | Design Effects |
| DEO | District Education Office |
| DFID | Department for International Development |
| DHS | Demographic and Health Survey |
| EA | Enumeration Area |
| EFA | Education for All |
| EMIS | Education Management Information System |
| ERP | Economic Recovery Programme |
| ERRC | Education Reform Review Committee |
| ESRC | Economic and Social Research Council |
| FCUBE | Free Compulsory Universal Basic Education |
| FTI | Fast Track Initiative |
| GAR | Gross Admission Rate |
| GDP | Gross Domestic Product |
| GER | Gross Enrolment Rates |
| GES | Ghana Education Service |
| GET | Ghana Education Trust |
| GEU | Girls Education Unit |
| GLSS | Ghana Living Standards Survey |
| GNCTE | Ghana National Council for Tertiary Education |
| GNP | Gross National Product |
| GoG | Government of Ghana |

| | |
|---|---|
| GSS | Ghana Statistical Service |
| HHH | Household Head |
| HIPC | Highly Indebted Poor Countries |
| ICCC | Intra-Cluster Correlation Co-efficient |
| IFPRI | International Fool Policy Research Institute |
| IGLS | Iterative Generalised Least Squares |
| ILO | International Labour Organisation |
| IMF | International Monetary Fund |
| IV | Instrumental Variables |
| ISSER | Institute of Statistical, Social and Economic Research |
| JHS | Junior High School |
| JSS | Junior Secondary School |
| LSMS | Living Standards Measurement Survey |
| MDGs | Millennium Development Goals |
| MoESS | Ministry of Education, Science and Sports (Ghana) |
| MPI | Multidimensional Poverty Index |
| MSLC | Middle School Leaver's Certificate |
| NAR | Net Admission Rate |
| NER | Net Enrolment Rates |
| NERP | New Educational Reform Programme |
| NGO | Non-Governmental Organisation |
| NLC | National Liberation Council |
| NSCE | New Structure and Content of Education |
| OECD | Organisation for Economic Co-operation and Development |
| OLS | Ordinary Least Squares |
| PNDC | Provisional National Defence Council |
| PPS | Probability Proportional to Size |
| PSU | Primary Sampling Unit |
| PTA | Parent Teachers Association |
| PTR | Pupil Teacher Ratio |
| RCT | Randomised Control Trials |
| SAP | Structural Adjustment Programme |
| SNDA | Savelugu-Nanton District Assembly |
| SIM | Social Impact Mitigation |

| | |
|---|---|
| SRS | Simple Random Sample |
| SSS | Senior Secondary School |
| SSSC | Senior Secondary School Certificate |
| TIMSS | Trends in International Mathematics and Science Study |
| UNDP | United Nations Development Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organisation |
| UIS | UNESCO Institute for Statistics |
| UNICEF | United Nations Children's Fund |
| UPE | Universal Primary Education |
| WASSCE | West African Senior School Certificate Examination |
| WFP | World Food Programme |
| WSD | Whole School Development |

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background

The Millennium Development Goals (MDGs) include an international commitment to the universalisation of access to primary education at the global level by 2015; and to the reduction of absolute poverty, as measured by money-metric consumption, by half. Ghana is one of few sub-Saharan African countries for which both these targets lie potentially within reach at the national level; with enrolment in primary school currently standing at around ninety per cent and absolute poverty having been reduced from its 1990 level by more than 43 per cent by 2005/6 (GSS 2007a). These facts naturally belie considerable intra-national variation; and patterns of differential impact in terms of the benefits of economic growth, poverty reduction and educational expansion present challenges for equitable and sustainable economic and educational development in Ghana.

The greater prevalence of poverty among the less well educated is a pattern which may be found in practically every context, although the relationships between education and poverty are complex, contingent and disputed, especially because poverty acts as a cause of low education levels as well as a consequence (see Knight et al. 2008). It is well established in developing country contexts that household economic welfare levels are a key determinant of children's school enrolment, completion and attainment (Canagarajah and Coulombe 1997, Dreze and Kingdon 2001, Filmer and Pritchett 1999). Equally, household welfare levels are strongly associated with the human capital assets of household members, most particularly their educational attainment. Notwithstanding the complexity of this system of co-determining relationships, there are sound intuitive, theoretical and empirical reasons to believe there are certain important synergies between educational development and poverty reduction, not least those based in the Human Capital Theory (Schultz 1961; Becker 1964) and in both the

household consumption and household production function models (Becker 1965). Moreover, while poverty may be considered both as cause and consequence of low levels of education; both are also closely linked to and mediated by contextual factors outside of the household, including local levels of economic development and educational infrastructure.

Basic education may be considered in terms of a social and economic 'vaccine' whose direct and indirect effects have the potential to contribute significantly to poverty reduction (see Appleton 2001). But 'relatively pro-poor' educational expansion requires that the poor benefit disproportionately from increased access to the benefits of education, which in turn depends not only on trends in schooling participation but on the evolution and distribution of the relationships between educational assets and economic welfare. It is clear that the economic benefits of education are not uniformly distributed and depend on a range of contextual, intermediary and extraneous factors, relating not least to local labour markets (see Kuepie et al 2006; Fafchamps et al 2009). If the benefits of education are lowest for the poorest and most recent beneficiaries, who also fail to access higher levels of education, the poverty-reducing potential of education policy may be undermined and the education-poverty relationship may be subject to 'trade-offs' 'feedback effects' or low education and income 'traps' (see Knight et al. 2008). Understanding the range of economic, demographic and geographic factors which mediate between the acquisition of knowledge, aptitudes and skills and the alleviation of poverty is therefore a central concern both for students of development and for policy makers.

The imperative to increase access to basic education in Ghana has been strengthened in recent years through a number of national and international initiatives including the country's accession to the Education for All (EFA) Fast Track Initiative (FTI), the implementation of the national Free Compulsory Universal Basic Education policy (FCUBE) and of the Capitation Grant scheme. Moreover, the increased availability of donor funding in recent years, alongside relative economic buoyancy have enabled a number of African states' including Ghana to pursue educational expansion, resulting in rapid growth in school enrolments. In both Ghana and Uganda, for example, education has expanded rapidly in an era of democracy and sustained economic growth. However, within Africa, only Uganda had a higher ratio of school enrolment expansion to wage

employment growth in the early 1990s than Ghana's figure of 16 to 1 (Bennell 1996). Not coincidentally perhaps, both countries experienced a return to multi-party politics in the 1990s, doubtless a partial motivator for national administrations to make and deliver on pledges with widely shared benefits, including UPE (see Stasavage 2005).

While education may justly be considered a 'human right', its economic benefits play an important role in motivating demand for education, including at the level of government. The potential benefits in terms of poverty reduction, while not clear-cut (see Glewwe et al 2007) may be of particular importance in developing countries. For example, Ghana's blueprint for development enshrined in the document "Vision 2020" commits the country to

> enhancing human capacities through the education and training of all citizens...in order to reduce the level and incidence of poverty, increase employment opportunities, and ensure real increases in individual and national incomes (GoG 1997: 6)

While only part of a much wider approach, the commitment to the use of education for the furtherance of economic development is clear. 'Vision 2020' sets out a comprehensive development framework to transform Ghana into a middle income country in a generation, aiming for a GNP per capita of US$4000 by 2020. Central to the framework is the promotion of economic growth and the reduction of poverty and it is envisaged that education and training will play a key role in the pursuit of these goals. The strategy calls for "increased investment in human capital to increase labour productivity" in order to better use Ghana's abundant labour (GoG 1997: 55). Education is intended to play this role more effectively through "continuing curricular reform, including emphasis on science and technology, to make education more relevant to socio-economic realities and national aspirations" (GoG 1997: 89). The strategy also sets out measures to attempt to remedy the "inadequate links between education and employment" (GoG 1997: 94).

However, a number of recent empirical studies have cast doubt on earlier findings of high 'returns' to primary education in Africa (see Pritchett 2001) and the 'conventional wisdom' of World Bank lending policy (see Psacharopoulos 1994) - that returns to education are higher in poor countries and for lower levels of education - is becoming harder to justify in the light of recent studies (for example Colclough et al. 2009),

conducted in the wake of rapid educational expansion at the basic level. Recent history has also shown that intensive drives towards EFA have often been followed by a reversal of enrolment gains and an increase in 'drop-out', indicating serious questions of the sustainability of EFA in sub-Saharan Africa (Avenstrup et al. 2004). Equally, despite considerable progress having been made towards many dimensions of universal access, EFA continues to be beset by serious challenges both of supply and of demand in sub-Saharan Africa generally and in Ghana in particular, not least those associated with educational quality (see Johnson 2008).

Economic growth is increasingly and justifiably acknowledged as central to poverty reduction, not least by donors as in DFID's 2008-13 Research Strategy, where it appears as the foremost theme (DFID 2008). The current global economic crisis of course focuses attention even more keenly on the potential for poverty reduction due to growth in the future, particularly because it is clear that much of the improvement in standards of living in Ghana in the years since 1991 has been possible because of growth (see GSS 2007a). Educational expansion and development both contribute to growth and result from it; but at the same time affect and are affected by growth modalities and trajectories. Educational development which is pro-growth is likely to be that which acts in favour of employment, and enhances productivity, both of labour and the other factors of production, primarily by creating skills (see Palmer et al 2007). Equally, growth which is relatively skilled-labour intensive is likely to enhance the value of and demand for education, completing a potentially virtuous circle. The extent to which growth promotes educational access and especially equity of access, however, depends upon how the benefits of growth are distributed, particularly where the obstacles to enrolment lie on the demand-side. Relative exclusion from the benefits of growth and of education among the poorest not only threaten the sustainability of progress towards and the achievement of EFA, but also risk entrenching exclusion yet further if better educated and wealthier groups benefit disproportionately from educational achievement (see Schultz 2004), potentially widening the gap and thereby 'kicking away' the educational ladder[1].

[1] The phrase 'kicking away the ladder' it taken from Ha Joon Chang's eponymous book (Chang 2002) where it is used in relation to his thesis that Western interventionist economic policies served to benefit their own development while at the same time preventing developing countries from adopting the same strategies.

While in global terms Ghana remains economically poor and access to basic education is relatively limited, both economic growth and widening participation in education have been steady features of the country's development since the late 1980s. Ghana is considered to have been a strong implementer of 'structural adjustment' and a 'strong liberaliser' of its economy in African terms having undertaken wide ranging reforms of trade, fiscal and supply side policies in the 1980s and 90s (see OECD 2001a:10). These reforms have brought some export sector growth as well as low inflation and have reduced labour market rigidity (OECD 2001a:14), although their overall success is debated. Their intention to reorient the economy towards the private sector and self employment has been achieved somewhat through retrenchment in the public sector (see Younger 1996), although there has also been growth in private sector employment. Nonetheless, to a certain extent growth in Ghana through the 1990s and thereafter has been, particularly in some regions, of the 'jobless' variety; characterized by a shift in the labour market away from relatively well paid public sector employment in favour of typically lower paying informal economic activity, although incomes in these activities have been rising. Moreover, some studies of manufacturing industry have found no general increase in productivity or technical efficiency over the period since 1991, despite improved levels of education (Rankin et al 2002).

In terms of educational provision, impressive indicators characterised both Ghana's early and pioneering post-colonial education system. Between 1960 and 1966 for example, school enrolments doubled and the system was widely acclaimed in Africa (Anamuah-Mensah 2002:3). The early expansion of Ghanaian education was, however, checked by economic decline and political instability and both access and quality suffered considerably in the 1970s, but were revived with donor assistance following the economic recovery initiated in 1983. A commitment to free basic education for all was specified in the 1992 Constitution and in 1996 the FCUBE initiative was launched with objectives consonant with those of the World Education Conference at Jomtien in 1990. Continuing reforms have emphasised further reduction of cost barriers as well as diversification and less traditional teaching methods, although some evidence suggests their implementation has been weak (Anamuah-Mensah 2002: 4). Nonetheless, Ghanaian education today remains beset by deficiencies of access, facilities and allowances, by poor conditions of service, a lack of materials, the prevalence of untrained teachers, poor quality instruction and weak administration and management

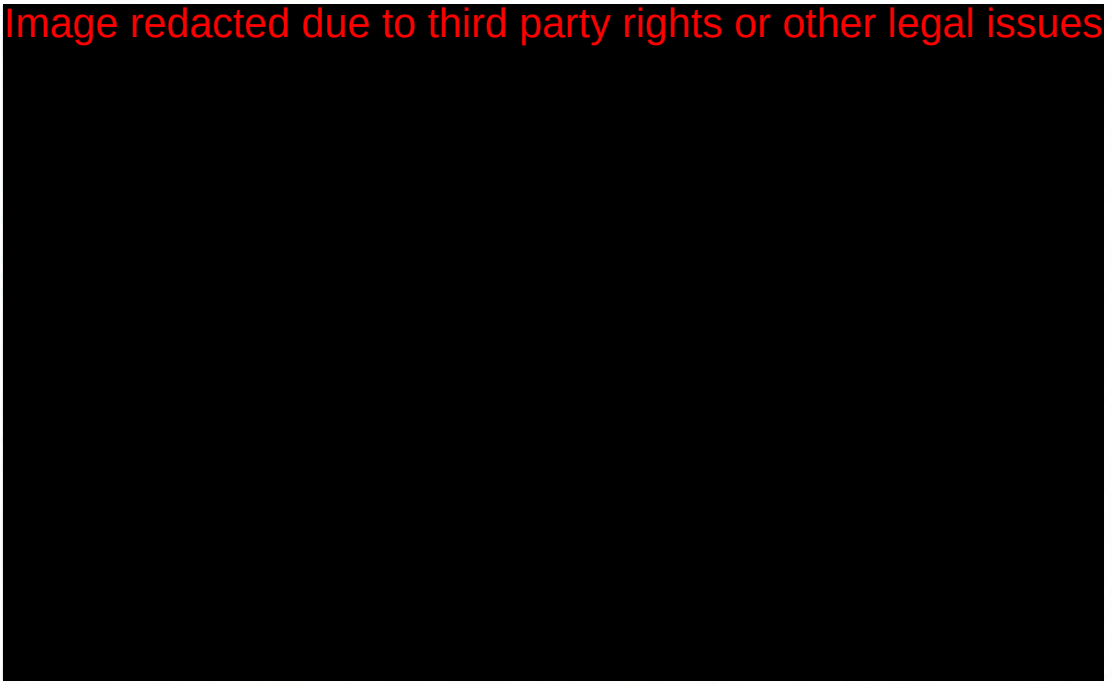
(Anamuah-Mensah 2002: 7-8). Specific challenges include a lack of facilities and equipment, disparities of enrolment and attainment between poorer rural areas and richer urban areas and poor outcomes overall as measured by criterion referenced tests, including TIMSS (Trend in International Mathematics and Science Study).

## 1.2 CREATE and the CREATE Exclusion Model

Parts of this work both draw on and contribute to the research outputs of the UK Department for International Development (DFID) funded Consortium for Research on Access, Equity and Transitions in Education (CREATE). The conceptual approach employed by CREATE and developed by Lewin (2007) is drawn upon in modelling and interpreting educational access and exclusion. The model provides a simple typology of access and exclusion levels and dimensions which is useful for comparison between countries and for examining national level patterns of pupil stocks and flows in the basic education system. Figure 1.1 below illustrates the model. The vertical axis denotes the participation rate which may be construed either as a gross enrolment or net enrolment ratio. The pattern of participation shown, which is illustrative only but broadly indicative of the pattern in Ghana, is one in which around four fifths of children enter grade one of primary school, with around one fifth never attending school. Those who never attend are said to be excluded in Zone 1 of the model. Zone 0 comprises those who had never attended pre-school. The diagram represents a cross-sectional view of access rates for a notional year. It is clear that in the scenario depicted, drop-out has the effect of increasing exclusion rates (lowering enrolment) rather steeply in the earlier grades of primary school. Children who drop out of school during the primary cycle are said to be excluded in Zone 2. Others who remain in primary school may make little progress owing to poor attendance and/or learning and other factors associated with dropping out and may be therefore considered 'at risk' of dropping out. These children are said to be excluded in Zone 3. In this sense the CREATE model is concerned with 'meaningful access' rather than only with narrower conceptions of access such as school availability or enrolment or attendance per se. Zone 4 exclusion comprises children who completed primary school but failed to make the transition to secondary education, while Zone 5 comprises lower-secondary level drop-outs. Those 'at risk' of dropping out of secondary school owing to poor attendance or poor progress

or perhaps to rising opportunity costs for older children are said to be excluded in Zone 6.

**Figure 1.1: CREATE Zones of Exclusion**




Source: Lewin (2007)

### 1.3 Rationale

The sub-Saharan Africa region is not only the world's 'least educated' but also its poorest and is consequently the most pressing context from the development perspective in which to examine the links between the improvement of human knowledge and skills, economic welfare and poverty. While Ghana remains relatively successful in enrolling most of its school-age children – with almost 90% currently in school (see UNICEF 2010) wider exclusion from education and its benefits is pervasive and relatively little understood. Moreover, the rate of progress towards universal levels of access appears to have faltered in recent years and may yet fall short of what is required for the achievement of the MDG of universal primary education by 2015. Difficulties are of course exacerbated in an environment of expansion. When the very poorest groups in Ghana are considered, despite reductions in certain cost barriers, there is little evidence of access expansion in proportionate terms at all in the period since 1999.

Moreover, there is relatively little evidence of improved welfare or standards of living for the least advantaged groups since 1991 (see Chapter 4).

The completion of a fifth round of the Ghana Living Standards Survey (GLSS) in 2006 makes available a highly comparable cross-sectional time series of rich data spanning a fifteen year period and provides an opportunity to explore in some detail the extent, evolution and relationships between educational access/exclusion and economic welfare/poverty and the associated MDGs in the period. Improvements in modelling techniques including 'multi-level modelling' offer more sophisticated tools for the investigation of the relationships between education and welfare, particularly in terms of their context-dependence. While national surveys provide an excellent source of representative summary data, however, they are poorly suited to the study of less easily quantifiable phenomena, particularly at a local level. Moreover, it is not straightforward at high levels of data aggregation to identify or analyse in detail the mechanisms by which more nuanced factors such as historical influences and cultural beliefs and practices influence relationships between education and poverty. Large scale surveys such as the GLSS collect only relatively crude indicators in relation to such factors. Also for the purposes of causal inference, statistical analysis relies upon well-developed theory or structural models which are not typically available where local-level factors, such as cultural influences are concerned. Statistical relationships cannot be established at district level using national level data such as GLSS owing to their design, which provide for representative data only at higher levels. Macro-level relationships at higher levels are 'averages' and thus may mask important within-level variation which results from factors at the local level.

To take the example of child fosterage, a practice which is common in Northern Ghana, the impact of a child being fostered on his or her educational access depends upon the reasons for fosterage, which are deeply embedded in local cultural context; and some of which promote educational access and others of which inhibit it. Accordingly, in addition to national-level analysis, a more nuanced exploration of education and welfare issues requires more focused study at the local level, which must rely on alternative data sources and methods. CREATE conducted a Community and Schools survey in 2007-10 in two deprived districts (in terms of educational supply indicators). The availability of this data and of contacts at the school and community levels through

CREATE provides an ideal opportunity to examine issues of educational access in depth and detail at the district level and below; which is further pursued through semi-structured interviews with key informants in one district.

### 1.4 Research Problem

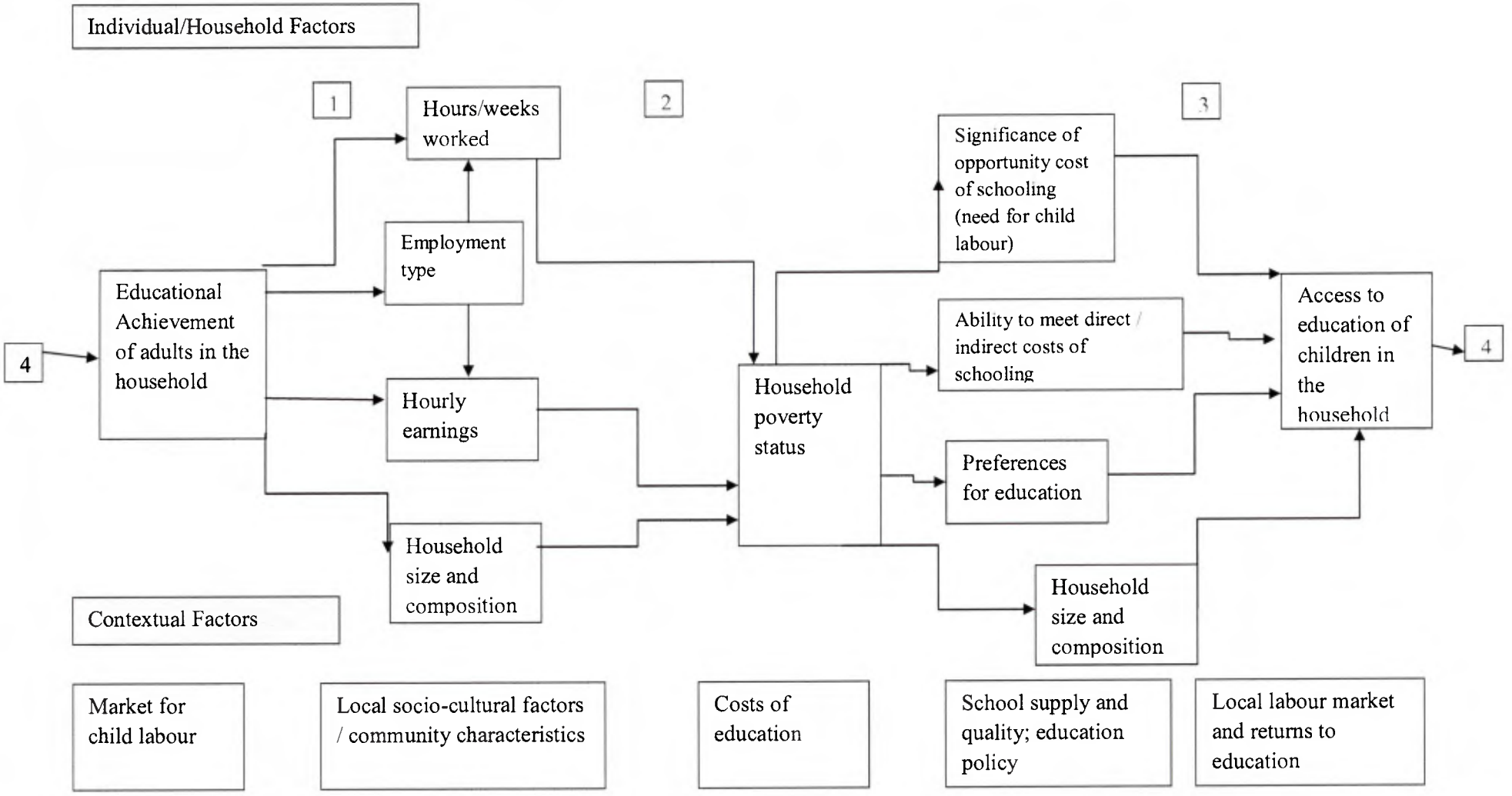
The main research problem addressed by this study centres around the determination of and synergies between educational access and achievement and economic welfare and poverty in Ghana, set in an wider international context of educational expansion towards universal access to basic schooling and of the imperative to reduce poverty to half of its 1990 level by 2015. Ghana's admirable progress towards poverty reduction and increased educational opportunity provide an instructive context in which to explore the system of co-determination of education and poverty and to consider appropriate policy implications. The estimation and interpretation of this system of direct and indirect causal linkages, primarily between economic, educational and demographic factors forms a primary focus of the study. While a lack of productive skills is one explanation for poverty, equally poverty may be considered a reason for a lack of skills. These linkages are driven by the characteristics of individual household members, by household-level factors and by the nature of the context in terms of the immediate locale, the geographic and administrative area and the point in time. Many of these factors are of course influenced directly and indirectly by policy interventions including Ghana's initiatives for improving educational access.

Figure 1.2 below illustrates a number of potential linkages which are hypothesised to mediate the codetermination of education and poverty inputs and outcomes and which are able to be modelled to some extent using survey data. Once an individual's highest level of education is determined, contextual factors influence earnings opportunities and returns to education, through the functioning of labour markets. But individual education may also be expected to affect employment selection, particularly where lucrative wage employment is concerned, and may also affect the number of hours and weeks worked, further affecting earnings received [see 1]. Along with household size and composition, also affected by education, these factors are likely to be important determinants of household economic welfare and poverty status [see 2]. The economic status of a household may be expected to influence decisions about children's schooling

through a number of mechanisms linked to affordability and to the balance of costs and benefits of education [see 3]. In Ghana, as in many contexts, economically poorer households tend to have more children, affecting their per-capita levels of economic welfare and the affordability of education. Outside the household, wider contextual factors determine the value of child-labour, the availability and quality of schooling, the costs of schooling and may also affect household size and composition. Thus both access to and the economic benefits from education are determined by an interaction between individual and contextual factors and together these relationships form part of an inter-generational system of transmission [see 4].

These linkages may be considered general, but they depend at the local level on a range of more specific factors and mechanisms, including local livelihoods, education supply and the role of cultural beliefs and practices, especially those which impact on household composition (e.g. polygamy), preferences for education (e.g. linked to gender roles) and children's work.

**Figure 1.2: Examples of hypothesised relationships between poverty and education**



## 1.5 Research Questions

The investigation of this system is intended to address a main research question:

To what extent did improved educational access provide a route to poverty reduction in Ghana between 1991 and 2006 and on what does the successful educational route out of poverty in Ghana depend?

Addressing this research question requires attention to a number of sub-questions. Indicative sub-questions are shown in Table 1.1 below, which also indicates the chapters in which these sub-questions are addressed through discussion of findings. The district-level study which addresses sub-question 8 adopts an emergent design and further sub-questions are enumerated in Chapter 8.

**Table 1.1: Indicative Research sub-Questions**

| Question /Chapter | | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|
| 1 | What are the key patterns and trends in welfare/poverty in Ghana between 1991 and 2006? | * | | * | | | |
| 2 | What are the key patterns and trends in educational access? | * | | * | | | |
| 3 | What are the key determinants of welfare/poverty outcomes and, specifically what role is played by education? | | * | * | | | |
| 4 | What are the key determinants of educational access and, specifically what role is played by welfare/poverty? | | * | * | | | |
| 5 | How are the effects of poverty / economic welfare on educational access distributed and how have they evolved over time? | | * | * | | | |
| 6 | How are educational effects on welfare/poverty outcomes distributed and how have they evolved over time? | | * | * | | | |
| 7 | What is the importance of employment selection and of the distribution of income sources in the determination of welfare/poverty and what role does education play in determining employment selection? | | * | * | | | |
| 8 | In the context of one deprived district, what role do contextual factors including cultural beliefs and practices play in determining educational access and progression? | | | | * | * | * |
| 9 | Through what system of linkages are educational access/progress and the economic benefits of education linked and what are the implications for the poverty reducing potential of education? | | * | * | | | * |
| 10 | What are the policy implications of the findings with respect to the joint goals of EFA and poverty reduction? | | | | | | * |

## 1.6 Structure of study

Chapter Two reviews the literature. Attention is given to the human capital theory as a basis for understanding the economic benefits of education and to the household consumption and production functions as theoretical models of the returns to household investment in education and of decisions to invest in education. Consideration is given to the conceptualisation of absolute poverty and to inequality issues and to issues of poverty measurement and the estimation of its determinants. Empirical work is explored with a focus on Ghana and sub-Saharan Africa. Literature is also reviewed in relation to Ghanaian education policy in context and consideration is given to the relationships within a system of co-determining factors related to economic welfare and schooling outcomes.

Chapter Three describes the methodological approaches adopted and discusses the issues that surround them. Paradigmatic and design issues are considered. In relation to the use of survey data, this includes a consideration of the data employed and their limitations along with the basis for model selection and development. Modelling strategies are outlined and considered in relation to the research problem. Specific attention is given to the application of methods for addressing issues of data clustering and potential endogeneity issues. The development of a mixed-methods study of issues of educational access in one selected deprived district of Ghana is outlined, with attention to the benefits of complementary qualitative and quantitative methods and to the use of semi-structured interviews.

Chapter Four presents findings from a macro-level descriptive exploration of the GLSS data and of other key data sources, focusing on the empirical background to the main research questions, particularly the evolution of poverty and educational access/attainment and their key correlates and potential causes in the period 1991-2006.

Chapter Five presents preliminary empirical findings and discussion in relation to the modelling of poverty and welfare outcomes focusing on the effects of education alongside findings from modelling of educational outcomes, with attention to the role of economic welfare and poverty.

Chapter Six discusses the findings from the quantitative analyses presented in Chapters Four and Five along with their implications.

Chapter Seven provides the background to the mixed-methods district-level study in Savelugu-Nanton district of Ghana, reviewing existing literature and data on educational access in the district and reporting the findings of exploratory interviews with key informants.

Chapter Eight examines the practices of child fosterage and *kayaye*, a form of youth migrant labour, which emerge as key cultural factors associated with access to education, and considers their impact employing analysis of survey data and semi-structured interviews.

Chapter Nine contains the conclusions and recommendations of the study.

# CHAPTER TWO

# LITERATURE REVIEW: ISSUES OF EDUCATION AND POVERTY IN GHANA

This Chapter reviews key theoretical and empirical literature in relation to the research questions, particularly sub-research questions three to seven. It begins with a historical review of key education policies focusing on the emergence of initiatives for 'education for all' (EFA) in Ghana, linked to political and economic context. A consideration of the neo-classical human capital theory follows. The theory provides a theoretical justification for a causal link between education and earnings and therefore for a link between education and poverty, both at the micro and macro levels. The education-earnings link is reviewed in respect of both wage earnings and non-wage earnings, which make up the lion's share of household incomes in Ghana. The conceptualisation of poverty based on consumption derived from all household income sources is then considered, leading to a discussion of the household consumption function model and its application, with particular reference to education effects. Attention then turns to schooling participation and the household production function; and finally to the system of co-determination between educational access and attainment and economic welfare.

While the focus is on the relationships between education and consumption-based poverty, the discussion draws on a number of literatures which link educational investment and poverty and welfare outcomes. These include the literature on the estimation of earnings returns to schooling, on the wider benefits of education in terms of welfare and poverty in broader terms, the returns to education in consumption and the literature on the factors which influence educational investment, especially socio-economic characteristics. Important econometric problems relating to the estimation of these relationships, particularly concerning endogeneity and causal interpretation are highlighted.

## 2.1 Education Policy in Ghana (1945-2006)

Both in the 1950s and in the 1991-2006 period, Ghana stood out among its neighbours in West Africa on the basis of its high levels of access to and participation in elementary schooling. Commitment to free and universal basic education in Ghanaian education policy may be traced back at least as far as the last years of the pre-independence period and specifically to the 1951 Accelerated Development Plan (ADP) initiated by the newly elected leader Kwame Nkrumah. Even prior to that under colonial rule, the administration had proposed expansion aimed at universal access to primary education, notably in a ten year plan unveiled in 1945 and intended to be completed by 1970 (Akyeampong et al. 2007). Nonetheless, the period since independence in 1957 has not been marked by steady improvements in educational indicators, not least because Ghana suffered a period of economic decline in the 1970s and 80s, during which education was set back considerably.

The 1951 Plan set out the structure of a basic education system of 6 years of primary school, four years of middle school and five years of secondary school followed by a two year 'Sixth Form' which remained intact in large measure until 1974 and was eventually comprehensively revised in 1987 (Akyeampong et al. 2007). The ADP set out to abolish tuition fees which had acted as a formidable barrier to participation in education among more disadvantaged groups and the elimination of cost barriers to access has perhaps unsurprisingly remained a key objective of all subsequent comprehensive reforms.

The Education Act of 1961 in Ghana provided a legal basis for the ADP, promoting principles of, if not fully realising in practice, free (with the exception of books and uniforms) and compulsory elementary education. Expansion in educational participation was marked during the 1950s and 60s and large numbers of teachers were trained and deployed (Akyeampong and Furlong 2000). Not unnaturally, expansion was accompanied by criticism from some quarters relating to an associated decline in quality. The quality-quantity and quality-quantity-equity trade-offs have remained pervasive axes of debate surrounding basic education reform in Ghana. Foster's early characterisation of the nature of opposition to reform may also be considered to resonate through subsequent debate:

> there is little doubt that the period of rapid expansion did lead to a lowering of academic standards within the primary and middle schools...The opponents of the plan, in reiterating criticisms which had formerly led the British administration to proceed cautiously in the diffusion of educational facilities, ignored more significant consequences of mass educational expansion
>
> (Foster 1965a: 190)

A further perennial issue running through commentary on educational reforms in Ghana concerns the inadequacy of resources available to successfully implement change, especially in relation to facilities and equipment. Nonetheless, Ghana's education system in the early years of independence was often considered one of the best in West Africa and in Africa as a whole (1965a; World Bank 2004b). Early expansion was achieved in part by the deployment of untrained teachers and by the time of the abrupt end of the Nkrumah period in 1966, criticism centred on the erosion of standards was widespread and the Kwapong Review Committee was set up in 1967 by the incumbent National Liberation Council (NLC) to examine deficiencies and to review Nkrumah's ADP. Debate at that time also surrounded the emerging issue of educational relevance in view of the increasing phenomenon of unemployed school leavers. Indeed, Foster's 'vocational school fallacy' thesis was developed in opposition to the view that unemployment was in part the result of an inadequate focus on technical and vocational training in favour of academic education (Foster 1965b). He argued that Ghana's economy provided for few technical opportunities and that academic education remained a rational choice. This situation was not resolved in the period that followed Nkrumah's deposition since Ghanaian politics was characterised by instability and a succession of coups; and the Ghanaian economy suffered a period of prolonged decline.

The Kwapong Committee had recommended a ten year basic education cycle with a break at eight years for selection by means of a 'Common Entrance Examination' into 5 years of secondary schooling for higher achieving students, with two years of pre-vocational 'continuation school' for the remainder. Private primary schools flourished, meeting the demand for preparation for selection into secondary schooling among elite sectors of society. Pupils attending these schools were considerably more likely to progress and also did so at an age up to four years younger than their counterparts in government middle schools (Addae-Mensah et al 1973). By 1980, 30 per cent of secondary school entrants had attended private primary schools inviting serious questions of equity. The system came under review in 1973 by the Dzobo Education

Review Committee, partly responding to these equity concerns (Dzobo 1974; Kadingdi 2004). The Committee's findings led to the establishment of the 'New Structure and Content of Education' (NSCE) in 1974 which brought a common compulsory three year Junior Secondary School (JSS) phase into being, to be followed by four years of Senior Secondary School (SSS). Other changes included the establishment of the executive agency the Ghana Education Service (GES). The NSCE did not, however, remedy some of the fundamental and systemic deficiencies which affected basic education provision including poor levels of teacher training and a lack of resources (Kadingdi 2004).

Economic decline in the mid to late 1970s was notable in Ghana, while population growth remained significant. Decline persisted into the 1980s marked by high inflation, exchange rate devaluation, low levels of foreign investment and a decline in both agricultural and manufacturing productivity. GNP per capita fell by 23 per cent between 1975 and 1983 (Akyeampong and Furlong, 2000). By 1982, per capita income had fallen to a level 30 per cent below that in 1970 (Akyeampong et al. 2007). Education financing suffered considerably. Spending on education fell from 6.4 per cent of GDP in 1976 to only 1.4 per cent by 1987 (World Bank 1996). As a result, at the end of the 1970s, Ghana's education system was in decay, with devastating consequences for provision and quality of provision (Mfum-Mensah 1998). Facilities became increasingly dilapidated and many trained teachers migrated to positions in more economically buoyant Nigeria, often to be replaced by untrained staff. Gross enrolment ratios (GERs) fell from a high of 80 percent in 1980 to 70 per cent in 1987 (Colclough, Lewin and Chiswick 1993). Little (2010) cites a rather discouraging assessment of conditions from the World Bank:

> School hours and school terms have officially been very short and in practice even shorter. In many respects the school has been seen by unscrupulous administrators as a way of placing relatives or friends in salaried employment, even when the prospective teacher is semi-literate himself and his post not justified according to student numbers. Until very recently the few primary textbooks that have been available have tended to stay in warehouses or at best in urban schools. Exercise books were unaffordable or unavailable, while slates, chalk and other teaching materials could not be found. The job of circuit officer (inspector) has generally been considered a sinecure, offered as a reward to long serving teachers with no precise job description or clear duties. Teachers would only turn up to school when it suited them and consequently student attendance was generally low and dropout rates high. Teachers would often demand that

> students work on their farms which led parents to withdraw their children from school .....in many of the more remote areas, especially in the northern half of the country, the large majority (often more than 80%) of children completing grade 6, or even JSS1, were completely illiterate, not even able to decipher a simple word such as BAD (World Bank 1989: 18 cited in Little 2010).

An Economic Recovery Programme (ERP) was initiated in 1983 following an earlier military take-over led by Jerry Rawlings and the Provisional National Defence council (PNDC) in 1981. Linked to its economic strategy, Ghana embarked on a further review of the state of education provision by means of the 1985 Education Commission; and initiated its most comprehensive package of reforms in the post-independence era, beginning implementation in the form of the New Educational Reform Programme (NERP) in 1987. The committee identified serious weaknesses owing to poor quality, curriculum overload, poor facilities, low relevance and management inefficiency (Akyeampong and Furlong 2000).

Economic reform included measures concerning the reorientation of educational financing and budgeting to address financial credibility criteria required by the World Bank. Both economic and educational reform received considerable support from the World Bank. Initial results of the recovery programme were encouraging as economic growth returned in the late 1980s. Educational reform was in part a continuation and development of the 1974 policies but this time external support and a more buoyant economy offered better prospects for sustained achievement. According to the Education Ministry, "The 1987 reform policies took place mainly because of public dissatisfaction with the condition of education in the country which could no longer be ignored" (MoE 1987). Resistance, however, was significant among advantaged groups who were concerned about quality and increased competition both for resources and for the benefits of education (see Little 2010). External support, especially from the World Bank was important in the successful progress of the reform programme, which ultimately did reorient basic education in Ghana in several important ways:

> increased school quality can in turn be linked to the Bank's support which...helped sustain initially unpopular reforms, demonstrating the efficacy of working in partnership with a government committed to a well-defined sectoral strategy (World Bank 2004b)

Perhaps the most significant dimension of the 1987 reforms was the reorientation of the education system into a 6/3/3 pre-tertiary pattern, which it retains today, from a 6/3/4/2

pattern by reducing Senior Secondary School to three years' duration and removing the 2 year 'Sixth Form'. Basic education was to comprise six years of primary schooling followed by three years of Junior Secondary School (JSS) (later renamed Junior High School (JHS)) for all without a selection examination. Post-basic secondary school was to become a three year Senior Secondary School (SSS) cycle. In addition, the reforms concentrated on improving educational management including through decentralisation measures such as strengthened community involvement (discussed in Pryor 2010) including through PTAs and reformed district and school level management structures. There was an emphasis on expanding access while improving quality and relevance through curricular reform, which was intended to reflect the labour market more directly. In accordance with World Bank thinking, the 1987 reforms introduced a greater element of cost-recovery in secondary and tertiary education (World Bank, 2004b) while emphasising fee-free education at the basic level. They also required an increased level of community involvement from school management to school construction. The latter included the construction of 3000 school pavilions (Kadingdi 2004).

Momentum for reform which would improve access to basic education was strengthened in 1990 by the World Education for All Conference in Jomtien as well as Ghana's participation in a number of other international agreements such as the Declaration on the Rights of the Child and the Beijing Declaration on Women's Rights, but the mandate for a new and stronger initiative for universal primary education was provided unequivocally in the 1992 Constitution of the Fourth Republic of Ghana which marked the beginning of a period of stable democracy in the country. Article 39(2) required that:

> The Government shall, within two years...draw up a programme for implementation within the following ten years, for the provision of free, compulsory and universal Basic Education (GoG 1992)

However, by 1994 it had become apparent that the 1987 reforms had failed to address issues of quality and standards adequately and that access barriers remained considerable among disadvantaged groups. A new Education Reform Review Committee (ERRC), established in 1993, identified that only 6 per cent of pupils in grade six were achieving a score of 60 per cent in English, considered an age-

appropriate competency level and only 3 per cent reached the equivalent level in Maths (Kadingdi 2004). The committee recommended curricular reforms which were to form part of the next major policy initiative – the Free Compulsory Universal Basic Education (FCUBE) policy. While it was clear that the 1987 reforms had improved access, further growth required reform if it was to be meaningful and productive in terms of learning outcomes. The FCUBE policy was introduced in Ghana in 1996. The policy set out to make "schooling from Basic Stage 1 through 9 free and compulsory for all school-age children by the year 2005" (GoG 1996) and aimed at addressing long established deficiencies of quality. The policy was intended to abolish school fees more comprehensively than had been achieved in earlier reforms. It provided a comprehensive sectoral framework for reform in the basic education sector and required considerable decentralisation aimed at community involvement, alongside seeking to improve co-ordination of donor support. Improving gender equity in participation was a central aim and was supported by the establishment of the Girls Education Unit (GEU) in 1997. In addition, FCUBE focused on the development of curricula, improvement of teacher deployment and training and the strengthening of school and educational management structures. In many of these objectives, the policy may be considered a further continuation and development of earlier reforms, particularly the 1987 policies. With the support of donors, FCUBE was advanced through a number of related initiatives including the DFID supported Whole School Development (WSD) programme, initiated in 1999. The Ghana Education Trust (GET) Fund was established in 2001 to assist in the financing of education nationally, deriving its funds from additional expenditure taxes.

By 2005, when FCUBE's initial ten year period was drawing to a close, it was apparent that while there had been improvements in participation in basic education, the implementation of policy had fallen short in respect of providing for universal access. GLSS 5 data collected in 2005/6 showed a school attendance rate of around 81 per cent overall in the 5-17 age group but these rates were much lower for the poor and in Northern regions and reduced with age within the age-group of the basic cycle (see Chapter 4 ). As Akyeampong notes,

> One disappointment with FCUBE is that its input did not go far enough to offset the opportunity costs of schooling for the poorest households by abolishing all forms of fees and reducing significantly the indirect costs associated with

> attending school. The incidence of late entry, overage attendance and poor households' need for child labour also posed a further threat to the benefits FCUBE promised. (Akyeampong 2009)

Equally, the implementation of FCUBE has done little to silence critics of the quality of education in Ghana:

> It is thus apparent that there are a number of challenges facing the education system in Ghana. First there is a chronic shortage of resources; the government has been unable to ensure the supply of basic education materials...despite available donor funds (Kandingi 2004:15)

In response to apparent difficulties in raising attendance, especially among the poor in spite of FCUBE, The Ghanaian government began a pilot in 2004/5, under a World Bank programmatic scheme, of a capitation grant initiative. The initiative granted additional funds to schools directly on a per pupil basis and was piloted initially in 40 schools and then in 53 deprived districts (based on educational indicators). In 2005/6 the grant amounted to around 3 US Dollars per pupil and was intended to offset the costs that continued to discourage universal enrolment. The scheme was initially financed using funds from international initiatives including the Highly Indebted Poor Countries (HIPC) fund and the Social Impact Mitigation (SIM) fund. Following the introduction of FCUBE, schooling costs were primarily indirect and opportunity costs but the GES found that schools were continuing to levy a wide range of fees some of which were unauthorised (GES 2005). In support of this, the 2003 Core Welfare Indicators Questionnaire (CWIQ) survey found that around 25 per cent of children who were not attending school did not do so because it was 'too expensive'(GSS 2005c). Pilot exercises found the capitation grant to be an effective lever for improving enrolment and the Capitation Grant Programme was rolled out nationally in 2006 and has been associated with a recent surge in enrolment in administrative data (see Akyeampong, 2009), although no household survey data is yet available to explore the effects of the grant in detail.

## 2.2 Human capital theory and the economic benefits of education

The Human Capital Theory identifies a theoretical route from investment in education to increased individual incomes, economic growth and poverty reduction. The theory finds considerable empirical support in a large body of work. The basic belief that

human skills and abilities may be considered analogous to physical capital in their productive capacities and investment potential, which forms the basis of the theory, may be traced back at least as far as the work of Adam Smith (1776). However, it was not until the 1960s that the empirical basis for Smith's assertions was explored in depth. The term 'Human Capital Theory' first appeared in the writings of Theodore Schultz of the neo-classical Chicago School of Economics:

> I propose to treat education as an investment in man. Since education becomes a part of a person receiving it, I shall refer to it as human capital
>
> (Schultz 1960:571)

In his view, an individual's stock of human capital may be regarded as an asset on which an income or return comparable to rent or interest is earned. In this respect human capital becomes a factor separable from and to some extent substitutable for the other factors in the production function, particularly undifferentiated labour and physical capital. Further, human capital investment may be regarded as an acquisition of 'the means of production' to the extent that workers are able to take control of their own productivity and earnings unlike unskilled or undifferentiated labour. Conversely, a lack of human capital may be considered a cause of poverty, and Schultz makes this point specifically in reference to the difficulties experienced by African Americans in finding work (see Schultz 1961). Schultz further suggested that higher growth in more developed countries may be in part accounted for by their ability to invest for the long term in education and skills and hence in future productivity. A final point made by Schultz which has considerable importance in contemporary educational discourse is the fact that because the investment value and 'external' benefits of human capital are not fully recognized, human capital investment may be sub-optimal, particularly from the social point of view (Schultz 1961).

The Human Capital Theory was first investigated in quantitative terms by Becker (1964) and Mincer (1974) whose use of regression analysis of earnings functions produced a 'rate of return' to education intended to capture the value of additional education in earnings terms. In the great many empirical studies which have followed, there is good evidence that the better educated earn more overall and that a portion of the earnings differential may be directly be attributed to increased productivity as a result of human capital investments (see Psacharopoulos 1994; Card 1999; Patrinos and

Psacharopoulos 2004). Nonetheless, modelling of the causal effects of education using simple methods such as OLS (ordinary least squares) is complicated by a number of issues of endogeneity considered below.

Moreover, it is not only the individual who benefits from or invests in increased productivity and incomes through education and training. Accordingly, neo-classical theory distinguishes between the private return to educational investments which accrues to the individual learner, taking into account the costs incurred; and the social return which includes the social costs of state subsidy and hence describes the return to society's investment (see Psacharopoulos and Patrinos 2004). A wider conception of the social return also takes account of the benefits which accrue to society beyond those captured in increased individual earnings, known as externalities and which include, for example, reduced fertility (see McMahon 1999).

In the literature, a great many private and social rates of return have been estimated using a number of methods and with a variety of results (see Patrinos and Psacharopoulos, 2004). Where the cost of education is largely borne by the state, education may yield impressive private returns owing to the low private cost, particularly where incomes from foregone child labour are small. The classic pattern of returns to education in developing countries is thus one of higher private than (narrowly measured) social returns. Further, the pattern in the earlier literature, at least until the 1990s, evidenced especially in the work of Psacharopoulos (eg.1987, 1994), is typically one of higher returns in developing countries than in developed countries and of higher returns to lower levels than higher levels of education in developing countries (Patrinos and Psacharopoulos 2004). Many reported rates of return in the early decades of this work compare favourably with those attained by physical capital and such comparisons were attractive for social investors and especially the World Bank (see Heyneman 2003). Indeed, the belief that social returns to primary education are relatively high (24% in sub-Saharan Africa according to Psachoropoulos 1994) has played a particularly important role in motivating the drive to improve basic education in developing countries, with a view to improving growth and equity. In particular, these kinds of arguments were drawn upon heavily in the World Bank's 1995 policy statement on support for educational development (World Bank 1995).

However, the sub-Saharan African region is a context in which a great variety of returns to education have been reported, including very low and even negative estimates, with conflicting patterns according to the level of education. Bennell (1996) argues that there may have been a good deal of over-estimation in the past, questioning the methodologies used in rate of return studies and rejecting the existence of a global pattern on the grounds that the variation of methodologies employed does not allow for aggregation of data across countries or the drawing of generalized conclusions. Knight et al (1992) also contest the methodologies which report particularly high returns to primary schooling. In the Ghanaian context, Glewwe's study found that when the public sector was excluded, there were virtually no returns to education (Glewwe, 1996) and Pritchett's (2001) review of studies in Africa reports generally low rates of return, which accord with Bigsten et al's (2000) finding that rates of return to education may well be lower than those for physical capital in Africa. Some studies also argue that (narrow) social returns have also been overestimated in the past (Glewwe 1991, Weale 1993).

Besides highlighting methodological concerns, the variety of findings also indicates a need to examine returns in the light of wider macro-economic factors which play a role in wage determination linked with education and which are important for cross-country comparison. For example, trade openness, economic liberalisation through structural adjustment and the extent of economic growth were found to be particularly germane in the work of Soderbom and Teal (2003). Moreover, the human capital investment route to higher incomes assumes that education has the effect of enhancing productivity; that labour markets are competitive; and that levels of physical capital and infrastructure do not limit productivity growth. While the satisfaction of such assumptions clearly varies between countries and across time, intra-national variation in these complementary conditions for successful educational investment may also be important. Differences between rates of return to education by gender (see Aslam 2007) and between public and private sectors (Glewwe 1996) in some countries, for example, illustrate the importance of context and draw attention to the contingency of the assumption of competitive labour markets.

In Ghana, like many countries in sub-Saharan Africa, less than sixteen per cent of the labour force is employed in the formal wage sector (GSS 2000b). In addition, up to half

of the wage sector is made up of public service employment, where the link between earnings and productivity may be weak, despite apparently high returns in the sector. Thus, consideration of the economic value of education in Africa and Ghana more specifically cannot focus on wage-effects alone, especially given the employment of the bulk of the population outside of wage-labour in the agricultural sector, often relying on family labour. A sizeable literature attempts to measure education effects on the incomes of farmers and the self–employed, including for those in the informal sector which 'employs' a significant number of Ghanaians. Indeed it was in reference to the variety of often temporary self-employment strategies including street trading adopted by migrant workers in Accra that Keith Hart (1973) first coined the phrase 'informal sector'. Informal work is characterised by non-wage employment which may be distinguished into subsistence and entrepreneurship forms. According to Cross

> The informal sector (IS) describes economic activity that takes place outside the formal norms of economic transactions established by the state and formal business practices...the term applies to small or micro-businesses that are the result of individual or family self-employment. Cross (1998)

In Ghana, early examples of 'informal sector' work might include traditional or casual arrangements in petty trading, repairs, portering, and so on, outside of the colonial wage sector in pre-independence times. Current interest in the sector, however, has been focused by the expansion of informal employment following the decline of the formal wage sector after the economic crises of the 1970s and structural adjustment programmes (SAPs) begun in the 1980s (see Barwa 1995). In sub-Saharan Africa generally, declining wage employment in proportionate terms (see Adepoju 1993; Griffin 1996), especially public-sector employment (see Younger 1996) has pushed more and more people into the informal sector, focusing academic and policy debate on the economic potential of the sector. In a cross-country study, Griffin explains that

> Structural adjustment...resulted in a contraction of employment opportunities and real incomes. This contraction of the labour market took various forms which differed in urban and rural areas. In the urban areas the formal sector declined absolutely in terms of output and employment. This is especially true of public sector activities. Those who remained in formal sector employment usually experienced a fall in real wages...There has been a large increase in part-time employment and a rapid "informalization" of the urban economy in response to the contraction of formal sector activities. (Griffin 1996)

Nonetheless, Teal's empirical work using GLSS 2-4 found that education is almost as beneficial in the Ghanaian context for the self-employed as for the employed when considered in terms of the return to a given additional year of schooling using a model with a linear and a quadratic term. However, owing to a positive quadratic effect consistent with a convex pattern of returns, the higher average level of education in the formal wage sector means that workers in this sector receive higher average returns to a year of schooling:

> The returns to education at the means are higher for wage earners than they are for the non-agricultural self-employed...this difference is due, not to differences in the returns to education between wage earners and the non-agricultual self-employed, but simply to the differences in their average levels of education. (Teal 2001:7)

More recent work using GLSS 4 only, however, finds that the returns to education in self-employment and agriculture are significantly lower than in wage-employment (Kingdon and Soderbom, 2007). Moreover, according to the ILO, "poverty in the informal sector is a consequence of the fact that work does not yield adequate returns" (ILO 2001:31), which, in view of the size of the sector in Ghana especially, resonates with the view that "reaching the informal sector with skills development will be increasingly important to poverty reduction" (World Bank 2004a).

Some early studies reported notable benefits of education for farmers (Jamison and Lau 1982; Moock 1981 Lockheed et al., 1980). In more recent work again, however, returns are typically found to be considerably lower in agriculture than in wage-employment, including in Ghana specifically (Appleton and Balihuta, 1996; Kingdon and Soderbom, 2007). Jolliffe argues that "much of the value from increasing the educational attainment of farm households is found in its impact on off-farm activities, including the reallocation of time away from farm work" (Jolliffe 2004: 306), indicating that returns to educating farmers may also result from diversification away from farming. Nonetheless, in both farming and self-employment, the measurement of productivity effects of education may be considered in some sense more direct than in wage employment, where education may serve in part a signalling function with respect to potential worker productivity based on natural ability (Spence 1973) or a screening function with respect to social background (Arrow 1973; Dore 1980). At the same time,

however, returns to farm work and self-employment may also capture returns to physical capital and entrepreneurship, depending on the modelling strategy employed.

Despite controversy over rates of return more generally, reported magnitudes of rate of return estimates for Ghana using GLSS data covering the period 1987-1999 in various model specifications demonstrate relative consistency. Studies report a linear 1-2% earnings premium per year for farmers, varying by gender and specification (Teal 2001; Kingdon and Soderbom 2007). For the non-farm self-employed, estimates range from 1-4% (Teal 2001; Kingdon and Soderbom 2007). For those in wage employment, estimates of the return vary between 4 and 7% (Teal 2001; Kingdon and Soderbom 2007; Schultz 1999; Sackey 2008). Studies that compare a linear and quadratic functional form for the education-earnings function, using data from 1991-1999 find a positive quadratic effect in wage employment (Teal 2001; Kingdon and Soderbom 2007), indicating a convex relationship. This is consistent with studies reporting returns by level of education, which show steep increases by level (Schultz 1999; Sackey 2008). These studies also indicate increasing returns over time, especially at higher levels, with a year of tertiary education yielding a return of 12% in 1987-89 (Schultz 1999) and 18% in 1998-99 (Sackey 2008). These compare to estimates for a year of primary schooling ranging from zero to 5% (Sackey 2008).

More generally, recent evidence suggests that the evolution of returns to education in sub-Saharan Africa has shifted the established pattern of returns in the early decades of research so that higher levels of education are found to have higher returns than basic education in a number of countries, supporting a generally convex, rather than a concave, pattern of returns to years of schooling received and to levels of qualification. Schultz (2004) found that secondary and post-secondary education have the highest earnings returns in a selection of African countries. Colclough et al (2009) find strong support for a shift from a concave to a convex pattern in the 1990s and after in a review of a number of recent studies in Africa. They argue that the increase in supply of basic education graduates, a decline in demand for unskilled labour, technological change and falling school quality explain this shift. The shifting pattern is due to both increasing returns over time at higher levels of education and to falling returns to lower levels, varying by country. The recent findings reported above for Ghana are consistent with this shift, as are Aromolan's (2004) finding for Nigeria of a rate of return of 2-4% per

year of primary education with fairly steep increases in returns by education level post-primary.

Important endogeneity issues surround the estimation of individual returns to schooling, centring on the possibility of simultaneous determination of schooling and earnings which may bias OLS estimates if adequate controls are not included to ensure exogenous measurement of education levels. The direction of bias is contested (see Trostel et al 2001:10; Card 1999) and depends upon the balance between sources of bias. Individual ability may explain both educational achievement and earnings directly, including because to some extent employers may use education levels to 'screen' for natural ability (Arrow 1973). A range of socio-economic and family background factors in addition to ability may also impact on both schooling and earnings. Assortative mating may mean that adults in a household share similar education levels and unobserved preferences and interests, linked to their earnings (Trostel et al 2001:11). 'Sorting' of households into low and high income areas through migration may also produce a correlation between education and earnings not strictly due to the productivity effects of education. Equally, education impacts on employment selection so that part of the reward to higher levels of education is due to access to more lucrative employment types, rather than necessarily to increased productivity. Kingdon and Soderbom (2007) examine this in Ghana, finding substantial benefits of education with regard to selection into wage-employment when compared to farming, and that when accounting for the selection effect, returns to years of schooling are considerably reduced. Measurement error in schooling variables, which may be substantial in developing country data, may be expected to bias returns downwards (Ashenfelter and Krueger 1994), potentially offsetting the upward bias that might be expected from omitted ability; but the balance of biases is difficult to disentangle, so that Card (2001) concludes that no single study is likely to be conclusive on the issue. Alternative estimation methods may be employed to address endogeneity, such as household or village fixed effects (see Kingdon and Soderbom 2007) or instrumental variables (IV).
IV models often show somewhat higher returns than OLS (Card 2001), especially for developed countries. On balance, however, Psacharopoulos and Patrinos (2004) note that 'twins studies' and IV approaches tend to find a similar returns to education to the cross-country average reported in their study (Psacharopoulos and Patrinos 2004).

Accordingly, despite the difficulties, OLS estimates may be considered informative in general terms, in view of the issues associated with obtaining precise estimates.

A further issue concerns the use of schooling measures which do not take full account of differences in school quality (especially the number of completed school years) expected to impact upon productivity. Indications are that school quality in sub-Saharan Africa is often comparatively low (Glewwe et al 2007). In this context, measures of years of schooling may be a weaker measure of quality than qualifications, while measures of cognitive skills acquired through schooling may be considered perhaps a yet more desirable indicator of the productivity-enhancing effects of education. Such variables are rarely available in developing countries, however, although studies that have attempted to employ them show important wage effects (e.g. Bedi 1997; Glewwe 1991).

### 2.3 Poverty, human capital and consumption

To some extent, the Human Capital Theory may be considered, in itself, a theory of poverty. For Schultz, a lack of human capital is construed as a cause of poverty (Schultz 1961:16), with the possible implication that human capital investment may be a solution. If earnings reflect productivity and productivity reflects the value of the stock of human capital, then low incomes may be attributed to low education and skills (Becker 1995). While this is an oversimplification, the view is expressed in policy rhetoric in Ghana and elsewhere. Nonetheless, 'poverty' may refer to many 'deficit' situations, normatively defined in terms of the privation of material need, opportunities, rights, relationships and capabilities (see Nussbaum and Sen 1993; Sen 1999). Accordingly, no single definitions or measurement constructs can capture the full complexity of poverty, while there are a number of attempts to construct multi-dimensional measures of poverty and well-being (see UNDP 2010; Alkire and Foster 2011). The 'Multi-dimensional Poverty Index' (MPI) developed for the 2010 Human Development Report (UNDP 2010) centres on three key dimensions – health, education and standard of living, evaluated according to ten indicators, and may be considered a broad measure of poverty which gives due attention to access to services. When examining the relationships between education and poverty, in relation to the MDGs

however, a measure linked to the MDG poverty target (defined in terms of consumption poverty) and which is separable from access to education is required.

Measures of more narrowly defined economic aspects of poverty and deprivation, including those based on income and consumption are available in living standards survey data, including the GLSS. In addition to incomes from employment, agriculture and self-employment, a range of other factors influence the abilities of individuals to meet consumption and nutritional needs. The ownership of capital assets on which returns may be earned, alongside a host of factors associated with the area in which a household is located also affect susceptibility to poverty. Although income returns to education are important in the determination of material poverty, they do not centre directly on living standards and do not address important poverty-oriented questions such as those concerning how income is shared between income earners and dependents. On the issue of whether to measure poverty on the basis of an aggregate of all sources of income or using consumption proxied by expenditure, Friedman's 'Permanent Income Hypothesis' provides the classical case for the latter (Friedman, 1957). The hypothesis holds that consumption is a function not necessarily of current income but of long term expectations of income not yet earned. The point is that shorter term fluctuations in incomes are not strongly reflected in consumption patterns because individuals and households seek to 'smooth' consumption in accordance with their expected 'permanent income' including by borrowing, saving or releasing savings. The hypothesis suggests that consumption is a function of wealth or assets on which income may be earned rather than current income. 'Assets' may be taken to include 'human capital' such as education and experience as well as physical assets such as land and machinery. Thus, an approach which centres on per capita household 'consumption' or 'economic welfare' may be considered a more direct instrument for the analysis of poverty and consumption measures are the mainstay of the World Bank's approach for the purposes of international comparison (see World Bank 1990; Ravallion et al 2009).

A foundational assumption in microeconomic theory is that agents seek to maximise their total utility, given certain constraints, most obviously the resources available to them. Utility itself, a concept allied to happiness and the satisfaction of desires is somewhat unobservable empirically and hence requires the identification of proxy measures. Welfare, measured in terms of consumption of goods and services is a

standard candidate in economic approaches although clearly has its limitations given the broad range of contributors to overall well-being. Extensive work surrounds the measurement of subjective well-being (see Kahneman and Krueger 2006) and considerable debate surrounds the usefulness of standard economic measures of living standards; particularly concerning the apparent conflation of 'means' and 'ends' implicit in money-metric measures. Sen, for example, contrasts the intrinsic values of the 'capability approach' to well-being with the instrumentalism of the utilitarian approach to welfare (Sen 1993). Nevertheless, consumption plays a key role in the determination of living standards and may be measured by way of the money value of expenditure on goods and services. Accordingly it is possible to construct estimates of the resources needed to reach certain consumption levels which may be identified with levels of poverty, welfare, utility and nutrition. A key determinant of the resources required to reach a given utility level is of course the prevailing set of prices of goods and services.

A familiar method of poverty estimation used by the World Bank draws on an approach developed by Foster, Greer and Thorbecke (1984) and defines extreme poverty as a consumption level below the equivalent of $1 a day and moderate poverty as a level below $2. These measures are absolute in that they are fixed at constant monetary equivalent levels across time and space and say nothing about the overall distribution of consumption. In line with the World Bank approach, but taking account of the specifics of nutritional needs in Ghana, the Ghana Statistical Service (GSS) defines two Ghana-specific poverty lines in terms of nutritionally based money metric consumption (welfare) levels using the welfare variable computed from the GLSS (GSS, 2000). By contrast, relative poverty measures are intended to indicate the extent of inequality, considering poverty in terms of the context of the overall distribution of resources. Accordingly, it is possible for relative poverty to increase in a climate of rising incomes, as arguably, has been the case in Ghana (GSS 2007a). While income inequality is serious in sub-Saharan Africa and may be rising (Sala-i-Martin 2001), many individual dimensions of 'living standards' are nonetheless appropriately considered in absolute terms even if not in terms of money-metric measures. These include life expectancy, prevalence of disease, access to social services including education, access to water, sanitation and electricity and the satisfaction of nutritional needs. Relative poverty may, however, be considered in part a contributor to the determination of levels of these dimensions of living standards.

Quantitative work around the determinants of consumption includes regressions of consumption functions which 'predict' consumption values using a range of factors including household size, education levels and assets held by the household (e.g. for Ghana see Glewwe 1991; Canarajah and Portner 2003; Coulombe 2005). The consumption function may be considered an aggregation of the equations which describe the returns to various assets including wage equations and agricultural production functions. Other studies use logistic regressions to predict poverty outcomes (defined by consumption measures) on the basis of a range of explanatory variables (e.g. Abuka et al 2007). Both types of studies have found significant effects of education but it is notable that they have also found powerful effects for a range of geographic and contextual variables, according to which the effects of education may vary.

Consumption function regressions may seek simply to establish correlates or predictors of consumption or may set out to establish determinants. The difference lies of course in whether there is a direct interest in causality. Clearly, for the purposes of policy-relevant analysis, causality is central, since the ultimate aim may be to manipulate determinants of consumption, with the aim of reducing poverty. In which case, modelling must seek to include exogenous explanatory variables. A truly exogenous determinant of consumption will not be determined by past consumption nor be co-determined with current consumption. Such variables may be difficult to find. Studies differ according to their approach to endogeneity with respect to explanatory variables in the consumption function. Canagarajah and Portner (2003: 44) distinguish genuinely exogenous from 'pre-determined endogenous' variables where the latter, although they do not vary with current consumption, reflect a decision likely to have been made on the basis of welfare or utility considerations. The number of children in a household, for example, may reflect a strategy to avoid poverty. The choice of crops planted by farmers or of occupation for wage-earners is likely to reflect beliefs about the effects of these decisions on welfare and about any comparative advantage a household might possess in such activities. In the case of education, it is quite likely that the level of education of an individual today bears some relation to the wealth of the household in which he or she grew up and so was co-determined with past consumption. Indeed, while current assets may determine current consumption levels, the acquisition of assets in the past is likely to have been determined by past wealth, correlated with past

consumption. These forms of endogeneity are important explanations for the inter-generational persistence of poverty. Canagarajah and Portner (2003) sought to avoid 'pre-determined endogenous' variables as far as possible, although of course their model does include educational effects. They focus on 'community' variables including the presence of markets, banks, motorable roads, the prevalence of malaria and the availability of public transport, alongside wider contextual indicators such as the level of rainfall. They emphasise the point that since their dependent variable is consumption at the household level, and factors defined at the community level cannot be considered to be determined by individual household utility-maximising decisions, they may be taken to be exogenous. One complication of this approach is that if it is the case that migration decisions, based on unobserved household preferences, have the effect of 'sorting' households into communities. the estimates of community effects may be exposed to bias.

The approaches of Adjasi and Osei (2007) and of Coulombe (2005) are concerned only with consumption correlates. Naturally, this allows much greater freedom in the selection of variables. Their studies find significant associations at the household level in Ghana between consumption and a range of indicators of living standards including connection to electricity and mains water, toilet facilities, type of fuel used and construction materials used in housing (particularly for roofing). They also find positive values for the education of the household head and for those in formal employment and particularly in managerial and administrative occupations. This work serves to describe the characteristics of higher and lower consumption groups but also serves to identify potential endogeneity concerns in causal studies. Clearly, selection into certain occupational groupings is likely to be correlated with education and consumption levels although interestingly Teal (2001) found this is only significant in the public sector. An approach which may be considered to lie between that of estimating correlates and exogenous determinants is adopted both by Teal (2001) and Glewwe (1991). Their models allow for the examination of consumption determinants given prior asset accumulations and household characteristics. They include household size as an explanatory variable, treating it as pre-determined with regard to consumption levels, an assumption which must be borne in mind when interpreting their results. Equally, they include values for household 'assets' of various kinds and hence the

values of the 'effects' estimated are conditioned upon the particular distribution of assets which prevails in the data used.

Differences in modelling approach complicate the interpretation of findings of consumption studies and, as with estimation of the rate of return to education, a diverse range of results can be found. Nevertheless, in the Ghanaian context, a number of studies do show consistency in finding positive educational effects, although these may be rather lower in more recent studies. An early consumption study by Kyreme and Thobecke (1991) found that an increase in the education of the household head from none to primary education was associated with a reduction in household consumption poverty by one fifth. Teal found that an additional year of education of the household head has the effect of increasing consumption by between 1.9 and 2.9 per cent depending on the model specification (Teal 2001). Canagarajah and Portner (2003) found little association between consumption and lower levels of education but strongly significant correlations for higher levels with some variation by urban/rural location and by gender. Glewwe's study however found positive educational effects only for those employed in the public sector where years of schooling were used as the explanatory variable. When using measures of reading and mathematical ability in place of schooling variables, however, Glewwe found significant effects including for those employed in the private sector (Glewwe 1991).

Household consumption levels then are an important measure of material living standards, a key dimension of poverty. They are strongly associated with household education levels, with some evidence of a causal relationship, dependent on the returns to education in the various forms of income-earning activities pursued by the household. Household wealth and consumption are at the same time important determinants of the education of household members, most notably of children, as considered below.

## 2.4 Educational Participation

The model which forms the basic analytic framework for CREATE (see Chapter 1) defines full and meaningful access to basic education to include regular attendance, progression at appropriate ages with limited repetition, acceptable levels of achievement, and more rather than less equitable opportunities to progress to higher

educational levels. Clearly, forms of exclusion from these access dimensions including drop-out, poor attendance and poor progress are also important proximate determinants of attainment (Langsten and Hassan 2007). Exclusion from basic education will, for some children and their families be quite literal - where there is an absence of local school provision or perhaps where the real costs of schooling are prohibitive. But for others, non-attendance at school may be better considered in terms of a 'rational choice'.

An explanation of non-participation in or exclusion from basic education needs to account for features of the full range constraints and influences on the household decision to send a child to school. This decision may be considered as a part of a household's long term utility or welfare maximisation strategy and hence may be analysed within the cost-benefit analysis framework of Becker's household production function (Becker 1965). This framework conceptualises the household decision in terms of an attempt to compare the direct and opportunity costs of schooling on one hand with the future economic benefits to the household, including income returns, on the other. Two important market failures in particular may violate the assumptions of the basic model. In principle it is assumed that households do not face credit constraints with regard to investing in education, which is in fact likely to be a serious barrier in developing countries and may result in 'inefficient child labour' (Ranjan 2000). Further, there may be an informational asymmetry with regard to the benefits of schooling if some, especially poor, households lack information on the potential benefits of education. While it is not always possible to quantify all the costs and benefits of sending a child to school, the framework is useful in the context of low income countries such as Ghana, where family future security may depend on children's incomes and where poverty may mean that even relatively low direct and opportunity costs of schooling play a strong role in determining participation. For example, where school quality and relevance is judged to be poor and where costs are non-negligible, as Canagarajah and Coulombe (1997) suggest was the case in Ghana at least until the early 1990s, households may rather direct children into work. Further, where the expected returns to education are low, where there is little demand for educated labour or where there is high demand for unskilled labour, household demand for schooling may be low (Canagarajah and Nielsen 1999). Demand for child labour by households may be expected to be high when incomes are at a subsistence level (Canagarajah and Nielsen

1999) but also varies with household characteristics, inclusing assets (Cockburn and Dostie 2007). In particular, households dependent on agriculture may consider human capital investment to be relatively unproductive given that children can potentially contribute to farm outputs at a relatively young age and may consequently 'prefer' a larger number of children with lower education levels (see Becker 1993:121). These situations represent somewhat different forms of exclusion than those that result from to a narrower understanding of access constraints based on school supply.

Household demand for education thus reflects the net benefits of education which depend on features of the particular child, its parents and household (see UNESCO 2005); and of the wider location and context. The supply of public education is of course largely determined by local and national education policy and provision. At the level of the individual child, gender and age affect the true and perceived net benefits of education, through differences in the opportunity costs of schooling in terms of lost current earnings and in terms of differences in the returns to education and hence in future earnings (UNESCO 2005; Kingdon and Theopold 2006). The opportunity cost of schooling is largely determined by the rewards to and availability of child labour. While there is clearly a possibility of co-determination of a child's work and schooling, previous studies indicate that in the Ghanaian context among other developing countries, work is not necessarily antithetical to schooling and indeed many children combine schooling and work (see Bhalotra and Heady 2001). Moreover, Canagarajah and Coulombe (1997) did not find poverty itself to be a primary cause of child labour in Ghana, but found it to be correlated with demand for child labour through linkages with family characteristics, especially low parental education and through issues of the affordability of schooling. Consistent with the suggestion that poverty is not necessarily the primary reason for child labour, some studies find that poorest households are often those whose children neither work nor attend school (Canagarajah and Coulombe 1997; Siddiqi and Patrinos 1995; Ravallion and Wodon 2000; Bhalotra and Heady 2003; Bhalotra and Tzannatos 2003).

Direct and indirect costs of schooling may be falling as a result of efforts to improve access to schooling in Ghana, but studies prior to the implementation of FCUBE at least typically find that costs have a significant negative effect on enrolment (e.g. Lavy 1996). In Uganda, a study which examined the effect of fee-elimination policies on

enrolment found dramatic increases in enrolment (Deninger 2003), while indications for Ghana suggest a similar effect (see Maikish and Gershberg 2008). In addition, a child's birth order and relationship to the household head have been found to affect school participation in economically poor countries including Ghana, partly because households may be constrained from educating all children to the same level (Glewwe and Jacoby 1994). Household size and composition, including the nature and extent of dependency among household members may be expected to impact on the affordability of schooling decisions, and also the allocation of work such as household chores (Canagarajah and Coulombe 1997). It is also possible that the age and gender of the household head plays a role, through differences in experience and preferences for education (Lloyd and Blanc 1996). Household assets and income or consumption levels are found to be closely associated with children's participation and clearly affect the affordability of education. These effects might be expected to rise with the level of education, given that direct and opportunity costs are often much greater at the secondary level than at the primary (Checchi 2001). In Ghana, following cost-reduction policies, the lower secondary phase in Ghana is associated with lower costs than previously, while costs remain substantial at upper secondary. Parents' education is found to be a strong determinant of children's schooling in Ghana and sub-Saharan Africa more generally and may be considered to reflect 'preferences' for education (Bhalotra and Heady 2001; Sackey 2007; Canagarajah and Coulombe 1997; UNESCO 2005; Tansel 1997). Also, socio-economic and occupational groupings are typically found to be associated with school participation (e.g. Dreze and Kingdon 2001); also linked with preferences for education and/or child labour.

Outside the household and immediate locale, a panoply of regional and contextual factors affect both supply and demand for schooling. These include urban/rural location, issues of ethnicity, religion and language, the dominant forms of agriculture and the overall level of development including employment opportunities (Dreze and Kingdon 2001; Baschieri and Falkingham 2007). In their multi-level modelling approach to predicting school attendance outcomes using survey data from Tajikistan, Baschieri and Falkingham (2007) found that while individual, parental and household level characteristics were important, community factors; explored through issues associated with clustering in the survey data used; were also key.

Perhaps the most striking feature of the Ghanaian context overall is the North/South divide, which affects almost all indicators, including school participation (Fentiman et al. 1999). On the supply side, availability and accessibility of schooling are clearly important factors and these also differ substantially between Northern and Southern Ghana. Moreover, the availability of opportunities for progression to higher levels of education vary geographically and have been found to affect enrolment earlier on in a child's school career (Glewwe and Jacoby 1994; Lavy 1996); as have the prevailing returns to education in the region (Kingdon and Theopold 2006). Distances to school have also been found to be significant with regards to participation in Ghana, although their importance in general appears to be declining, perhaps as a result of school building and infrastructure development (Filmer 2007; World Bank 2004b). School quality, while difficult to measure, may be expected to influence participation and limited work in Ghana has established some positive effects of higher quality indicators (Fentiman et al. 1999; Lavy 1996).

While school participation depends firstly upon physical supply and upon the true costs of schooling to the household, policies to improve access in Ghana since the 1990s have served to draw attention to demand-side barriers, including both the demand for child labour and for education. These influences are strongly linked to household economic welfare, household composition, occupation and education-levels as well as to important contextual factors.

## 2.5 Education and poverty reduction

Improvements in levels of educational access and attainment may have poverty-reducing effects through a number of mechanisms including through effects on individual incomes and household consumption as already considered, but additionally through possible macro effects on growth and income distribution. An association may be identified between higher levels of education and skills in a country and more rapid economic growth (see Barro and Sala-i-Martin 1995; McMahon 1999; Hanushek and Woessmann 2008) and both between higher absolute levels and relatively more equal distributions of education and more equal income distribution (see Sullivan and Smeeding 1997), although all these patterns are highly contested. Schultz argues in relation to developing countries that

> the new capital available to these countries from outside as a rule goes into the formation of structures, equipment and sometimes also into inventories. But it is not generally available for investment in man. Consequently, human capabilities do not stay abreast of physical capital, and they do become limiting factors in economic growth. (Schultz 1961:7)

More recent work has emphasised the role of human capital in determining economic growth, particularly in 'new' or 'endogenous' growth approaches. These approaches offer an explanation of the effects of general education in terms of the climate for innovation, the adoption of technology and in terms of the ability of economies to undertake sectoral transformation (Romer 1986; Lucas 1988). They emphasise the 'external benefits' of education including in terms of the generation of knowledge. A key argument in these theories which originated in the work of Paul Romer (1986) is that investment in education may offset diminishing returns in physical capital investment thereby offering nations an internal development route through educational policy. Mankiw, Romer and Weil (1992) and Romer (1996) found in their cross-country studies that increasing the level of human capital raises a country's income level, while Barro (1991; 1997) found that human capital is a significant determinant of growth. Lucas (1988) models human capital in an augmented Solow (1956) production function but in addition allows for an external effect of the average level of human capital in the economy so as to introduce a relationship between general human capital outside the firms' control and output. He assumes no diminishing returns to human capital owing to the 'public' nature of knowledge and finds a significant effect of the average education level. Other endogenous growth approaches relate human capital to the process of knowledge accumulation either directly or via its effect on research and development activity with the intention of capturing the effect of increased innovation associated with human capital on the growth rate of production. It is suggested that up to 20 per cent of growth in output per worker may be associated with educational inputs (see Temple 2001:21) although this is contested, particularly because of the difficulties involved in measuring human capital inputs across countries (see Behrman et al 1994). Moreover, while some cross-country studies do find a positive effect of education on growth (e.g. Levine and Renelt 1992, Nehru and Dhareshwar 1994, Barro and Sala -i-Martin 1995), there are a number, often drawing on African examples, which find a negative association (see Mingat and Tan 1996 and 1998, Patrinos 1994, Pritchett 2001, Lopez et al 1998). Some argue that there is no obvious relationship between factor accumulation in general and growth (e.g. Easterly and Levine 2000). At the macro-

level, examination of the education earnings relationship is beset by formidable issues of endogeneity (see Glewwe et al. 2007). For example, particular policy orientations may produce both economic growth and educational expansion (see Ashton and Green 1996), growth may also encourage families to invest more in education, including for its consumption as well as its investment benefits (see Wolf 2002).

In more general terms, the 'external' benefits of education which accrue to wider society rather than the individual learner are notoriously difficult to estimate particularly in monetary terms. Their effects may be complex, indirect and long term. In the case, for example, of increased life expectancy or reduced fertility rates such effects manifest themselves over many years and depend on many other variables for their impact. Nonetheless, ambitious attempts exist to measure education externalities (see McMahon 1999). The 'wider benefits' of education including external benefits and those not immediately recognisable as economic, may be considered to exert notable poverty-reducing effects. The influences of education in determining public health (see Peters et al's 2010 study in Ghana), crime, parenting, gender equity and political participation may be substantial and in turn have both direct and indirect effects on human capital (McMahon 1999). In perhaps the simplest example, the well established effect of education in reducing family size has considerable potential to alleviate consumption poverty. Nonetheless, such benefits are contextually determined and not unambiguous. For example, relatively high education levels may be associated with gender equity in some sectors of the labour market but not others.

Clearly a complex system of relationships determines the poverty-reducing potential of educational investment. Where interest is in relative poverty, the issue may be complicated further owing to the debates that surrounds the effect of education and its distribution on income (in)equality. Educational routes to poverty reduction are likely at minimum to require pro-poor educational expansion (see DFID 2004:2), that is expansion that benefits poorer groups disproportionately and ensures that poorer children, often living in rural areas, do not receive low quality education with high drop-out rates (OECD 2001b:24). Nonetheless, since there is unlikely to be perfect substitutability between factors of production, it cannot be expected that human capital investment will address distributional concerns relating to the other forms of productive assets, especially land and capital and indeed it is this inequity which in part allows

better off groups to access higher level of human capital, potentially creating a vicious circle. The system of determinants of educational and poverty outcomes is explored in detail in the work of Knight et al (2008) which is considered in the next section.

## 2.6 The system of co-determination between education and poverty/economic welfare

An important recent paper by Knight et al (2008) adopts an ambitious approach to the estimation of the interrelationships between educational enrolments and quality, income, health and well being with attention to potentially vicious and virtuous cycles and low education and income 'traps'. The empirical work employs survey data from rural China. The authors estimate seventeen relationships shown in Figure 2.1 and denoted by the letters A to Q. The model shown in the figure gives attention to community, household and individual level factors. The study finds that parental education predicts children's enrolment and completion (F); enrolment at the community level is predicted by community level income (G) as well as household income predicting individual enrolment (D); community enrolment is positively associated with individual enrolment (J) and education raises individual and household income both by raising the number of hours worked and the income received per hour of work (M). It also finds that educational quality and the economic benefits of education are predicted by household (E) and community income (L) and that educational quality predicts enrolment (I) and the economic benefits of education (N).

Knight et al (2008:10) argue that this interdependent system is not one of simultaneous equations since determination is often intergenerational rather than contemporaneous. Causal interpretation of the relationships must be tentative given that many of the relationships are found to operate in two directions and to interact among themselves. However, estimating the full system of relationships has considerable explanatory potential and allows individual relationships to be interpreted in the light of others, reducing the potential for error. The authors point to possible 'traps' and 'cycles' in terms of a pattern of low investment in education among low income households, leading potentially to continued low income status; low child enrolment being associated with low parental education potentially creating an intergenerational cycle; low community level education influencing individual enrolment apparently reinforcing

low enrolment; and low levels of quantity and quality of education being associated with low levels of benefit, potentially stifling future demand. An important feature of the Chinese context is the large disparities in incomes and educational expenditure by authorities and households, and in educational quality between communities. Nonetheless, the pattern of findings is not inconsistent with findings for individual relationships in Ghana and sub-Saharan Africa as considered above, and the approach provides a framework in which these relationships can be assembled as part of a coherent picture. An important contribution of Knight et al's (2008) paper in addition to its systems approach to empirical investigation of important interrelationships is the ability of this approach to put together community, household and individual level determinants and outcomes. As the authors acknowledge, the necessary compromise in terms of depth concerning individual relationships may be compensated for by the breadth of insight gained in this novel approach:

> Most research papers in economics test one or two hypotheses: the research and its conclusions are specific and narrow. Broader conclusions might be drawn by introducing these research relationships into a more general system – by placing the results in the context of the research literature on related topics – but there is a natural reluctance to venture out in that way. In this paper we have taken a different approach. Our hypothesis is a very general one, which in turn gives rise to many sub-hypotheses, each of which requires empirical testing. In arguing the case we have had to adopt a broader, and therefore necessarily shallower, approach than is conventional in the research literature. The paper is also inevitably longer than is usual for journal articles. The trade-off is worth it because light cannot otherwise be thrown on an important general phenomenon viewed as a whole. Our combination of broad hypothesis and empirical estimation has not, to our knowledge, been previously attempted on this topic.
>
> Knight et al (2008: 37)

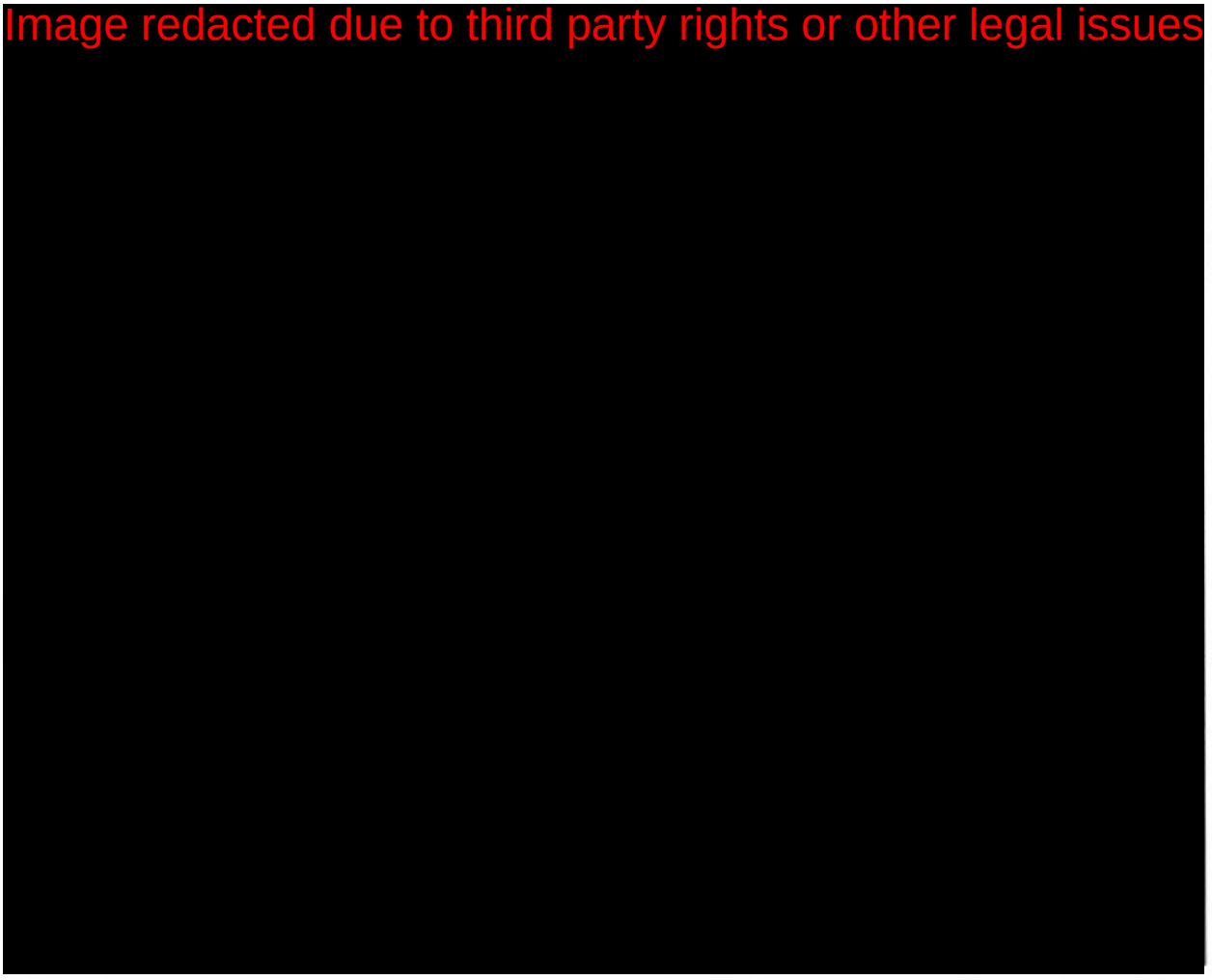
## 2.7 Conclusion

This chapter has explored several themes in the literatures which link educational investment and poverty levels. The findings in chapters four to six in particular contribute to these literatures with a focus on examining trends over time including evolving relationships, inter-generational patterns and the importance of contextual effects. While existing studies report findings in relation to earnings and consumption returns and to educational participation using the GLSS data, none does so using the three rounds to cover the period of the last three rounds, coinciding with a key period in relation to progress on the MDGs and with the introduction of important policies for

improving educational access. Further, the existing literature pays only limited attention to regional and sub-regional differences in the economic benefits of education and to the importance of occupational selection, particularly where poverty outcomes are concerned.

This study attempts to fill important gaps in the literature by interpreting the results of a range of descriptive analyses and modelling exercises as parts of an evolving system of co-determination between education and poverty levels. Inspiration is drawn from the Knight et al study and in the light of that study there is not an attempt to estimate a system of simultaneous equations but rather to examine a system of relationships in the light of their inter-linkages over time in an attempt to synthesise findings on the education-poverty relationship in the context of Ghana. Specifically, the study contributes to the literature on the importance of education and educational expansion for poverty alleviation in the light of relationships between education and earnings across regions and social groups and of the determination of educational access and progression outcomes and their benefits. The next chapter outlines the methodology for both the primary study, to which this discussion of the literature relates, and for the subsequent secondary study focused on one deprived district in Ghana.

**Figure 2.1 : System diagram of relationships between education, income, health and well being**




Source: Knight et al (2008)

HE: Adult health

EN: Enrolment

YC: Community income

EQ: Educational quality

EC: Community enrolment

EP: Parental education

HA: Happiness

Y: Household Income

# CHAPTER THREE

# METHODOLOGY

## 3.1 Introduction

This chapter describes the data used in the study and outlines the methods of analysis employed, alongside related methodological issues. It begins with an overview of the research design, epistemological approach and paradigm. The thesis makes use of both quantitative and qualitative data and of methods appropriate to their analysis and thus adopts a 'mixed methods approach' as considered below. More technical aspects of the models employed in quantitative analysis are outlined in Appendix B.

The study consists of several stages of analysis, beginning at the national level using survey data to model relationships between poverty, welfare and educational access and progression in order to address research sub-questions one to seven. One deprived district in Ghana is then identified as the site for in-depth study, beginning with a review of the literature and data relating to the district, followed by a set of interviews with key informants intended to explore the interactions between poverty and education at the local level in context and to identify issues for further study. This study addresses research sub-question eight. Fosterage and *kayaye* (a form of migrant labour) are identified and investigated using a mixed-methods approach, beginning with a review of the literature and proceeding with descriptive analysis and modelling using regional and district-level survey data followed by interviews with foster-carers and *kayaye* labourers, focusing on issues of poverty and educational access.

## 3.2 Epistemology and Paradigm

Idealised qualitative and quantitative approaches may be distinguished in a number of ways including according to their paradigmatic and epistemological foundations, the types of data and methods they typically employ and the logic of the arguments they

generate. Characteristically, quantitative analyses begin with numerical data and proceed to test a hypothesis employing statistical methods within a positivist ontological and epistemological paradigm, at the extreme relying on deductive logic. The model may be construed as analogous to an approach in the 'hard' natural sciences, although in fact in those fields attention is inevitably given to the role of interpretation and the perspective of the observer. To complete the dualist picture, qualitative analysis typically begins with textual or image-based data, employs an exploratory approach and develops inductive arguments within an interpretivist paradigm founded on an epistemology of social constructivism premised on a notion of multiple-truth; or in a post-modernist incarnation perhaps, on a notion of truth-claims as competing positions of power.

These polar positions bear only limited resemblance to the approach taken by any actual researcher, since interpretation is fundamental, while at the same time insights which have no appeal outside the specific context in which they are generated are arguably pure ephemera of interest only to the individual researcher. Moreover, to the extent that qualitative and qualitative approaches are opposed in this way, rapprochement appears unfeasible. In reality, pragmatic concerns predominate and justly so, since often a real concern, especially in development research perhaps, is to influence policy and practice. While insights of broader validity may be gained through survey approaches simply on the basis that they may be administered widely, the collection of numerical data necessarily exchanges epistemological breadth for depth. Deeper insights defy summary measures and are typically better suited to qualitative approaches which, typically rely on smaller, more purposive and less generalisable samples. To a large extent, the selection of appropriate methods and the ensuing methodological concerns depend considerably on the nature of the questions raised and the answers sought; while at the same time the methods adopted also determine the limitations of the findings. Complex social phenomena require a complex range of methods of investigation which originate in a range of disciplinary traditions presenting considerable challenges for the adoption of 'mixed methods'. Nonetheless, one potential benefit of mixing methods lies in the potential to combine the kinds of insights generated to gain perspective on the social phenomenon of interest.

This study comprises a primary macro-level enquiry employing quantitative data and analysis techniques drawing from economics and quantitative social science and an

emergent, secondary mixed-methods study at the meso and micro levels which employs both qualitative and quantitative data and methods including semi-structured interviews drawing on work in anthropology and qualitative sociology. The following sections describe the rationale for the use of mixed methods and the details of both the quantitative and qualitative methods used.

### 3.3 Mixed Methods Approach

Appropriate modelling techniques employing national level survey data may be expected to yield highly generalised findings, considered reliable and valid at the levels to which the survey data are representative and to the extent that the data collected accurately measure the phenomena of interest. While efforts are made to model the range of contextual effects on welfare and educational access, since the power of statistical analysis depends considerably on sample size, the operation of contextual factors in particular locations cannot be explored in detail using national surveys. Neither can they be explored in depth owing to the limited range and depth of questions asked. Especially where communities are substantially heterogeneous, due to cultural differences as in Ghana, in-depth analysis in relation to the study research questions requires more focused open-ended and purposive methods. The use of mixed methods therefore serves to rebalance the insight-generalisation axis, where use is made of methods of enquiry suited to explaining both macro-level relationships and the contextual phenomena that underlie them.

Greene et al. (1989) present a conceptual framework which categorises the purposes and potential benefits of mixed-methods research. They consider the paradigmatic and design implications and the potential insights gained from mixed-methods designs intended for triangulation, development, initiation, expansion and complementarity among findings. Methodological 'triangulation' sets out to corroborate findings generated using one method with findings generated using another, with the potential benefit of convergence and increased validity and reliability among findings. Initiation describes a purpose of mixing methods whereby a researcher identifies questions, contradictions or paradoxes using one method which are then addressed using others in an iterative process. The purpose of 'development' typically requires a more sequenced approach whereby findings established by one method are pursued further or in more depth by another. 'Expansion' refers to the use of mixed-methods to extend the scope

or breadth of findings from an initial method while 'complementarity' describes a purpose according to which overlapping phenomena are elaborated by the generation of overlapping insights from more than one method of data collection and analysis.

These purposes of mixing methods of course rely on paradigmatic assumptions or positions. For example, genuine triangulation relies upon the epistemological foundation of the methods to be combined being sufficiently compatible so that the findings relate to similarly conceptualised phenomena. Methods in the primary quantitative phase of this study generate generalised findings in relation to summary measures of constructs from survey questionnaires which are not directly applicable to the local level or indeed comparable with findings from interviews situated in a more interpretive paradigm. National-level quantitative work is used to identify issues which form the background for the secondary study and for the identification of the site for in-depth study. The intention is that the secondary study will generate more contextualised local understandings of educational exclusion within a more naturalistic ontological and epistemological framework, whereby social phenomena are considered to be constructed in and to belong to their natural settings (see Lincoln and Guba 1985). Thus the purpose of mixing methods is rather less triangulation than initiation with regard to the relationship between the primary and secondary studies. Within the secondary study, however, both local survey data and interview data are employed. While these are susceptible of forms of analysis which again do not yield highly comparable results, local-level understandings are expected to elaborate on the picture emerging from quantitative analysis in the district by adding meaning and nuance to relationships identified, particularly from a cultural perspective. To this extent both approaches contribute to a holistic response to the research questions and the mixing of methods serves the purposes of development, expansion and complementarity. While the findings are may not be considered to corroborate each other they may nonetheless present "stories that converge" (Greene et al 1989), if not findings that converge. Exploratory interviews, while drawing on the main study research questions also draw upon findings from the primary study while they generate questions for quantitative and qualitative analysis at district level, so that the process of mixing methods in the secondary study is iterative and the research strategy is emergent.

## 3.4 Methodology: Primary Study

> The only immediate utility of all sciences is to teach us, how to control and regulate future events by their causes. Our thoughts and enquiries are, therefore, every moment, employed about this relation: Yet so imperfect are the ideas which we form concerning it, that it is impossible to give any just definition of cause, except what is drawn from something extraneous and foreign to it. Similar objects are always conjoined with similar. Of this we have experience. Suitably to this experience, therefore, we may define a cause to be an object, followed by another, and where all the objects similar to the first are followed by objects similar to the second. Or in other words where, if the first object had not been, the second never existed. (Hume 1748)

Hume's definition of causation captures a central concern in social scientific analysis. Despite his use of the equivocation 'in other words', the two parts of this definition are susceptible of quite different analyses. The first is perhaps equivalent to 'constant correlation' while the second reveals a stronger metaphysical and empirically unobservable commitment in that it suggests an effect is not only conjoined with its cause but produced by it. Analysis aimed at influencing policy aims not simply to uncover correlations in the social world, but to identify levers whose manipulation has the potential to bring about change. In the case of poverty reduction, exploration of the correlates of poverty is only part of a consideration of its causes. As Cohen et al argue:

> the value of co-relational or causal studies lies chiefly in their exploratory or suggestive character...they are not always adequate in themselves for establishing causal relationships among variables, they are a useful first step in this direction (Cohen et al 2007: 266)

Quantitative data analysis per se serves only to explore and confirm statistical relationships among data, but requires theory to validate causal interpretation even if, from a positivist perspective, such theory itself relies heavily on empirical generalizations in a so-called 'paradox of induction'. In economic approaches, the theoretical component of empirical analysis is often termed the 'structural model' (see Wooldridge 2002:49), examples of which include the household consumption function and education production function. Such models represent theoretical constructs or frameworks in which logical or conceptual relationships between parameters are assumed or hypothesised, based both on behavioural assumptions and on past theoretical and empirical work. Clearly these are simplifications of true empirical relationships, require reasoned selection and modification and rely on important assumptions. However, such models are frequently empirically robust and demonstrate

considerable predictive validity. They nonetheless make assumptions about human behaviour among which, in economics, 'utility maximisation' and 'rational expectations' may be included.

The application of econometric and other forms of statistical modelling to ex post facto data may be considered in paradigmatic terms to fall mainly within the positivist epistemological tradition. Positivism emphasises empirical methodology rooted in scientific method and positivist approaches aim ultimately at prediction based on observation. The notions of the possibility of 'general understanding' and 'value-free' empirical enquiry are foundational. Philosophically, positivism may be considered opposed to speculative philosophy but in the context of research paradigms, a more informative contrast may be made with interpretivism in cultural anthropology or with postmodernism in social science. These traditions reject the application of scientific paradigms in the social world along with deterministic or functionalist analyses of causation in human behaviour, emphasising cultural difference, power-relations, subjectivity and interpretation. Some of these concerns may be considered particularly significant in the context of developing countries, given that work in the positivist paradigm has largely developed in reference to developed country contexts. While they do not invalidate empirical approaches in the positivist tradition, they do sound a note of caution in relation to the satisfaction of standard assumptions, to interpretation and to the importance of attention to context.

Sen has famously criticised the rationality assumption, utilitarian foundation and positivist paradigm of neo-classical economics and particularly of welfare economics. In particular, he has questioned the positivist separation between fact and value epitomised in Hume's work but evident in much work in welfare economics, arguing for rapprochement between ethical commitment and more technical analysis or 'engineering'. Nonetheless, he does not doubt the value of mainstream economic approaches,

> To give one illustration, the development of the formal 'general equilibrium theory', dealing with production and exchange involving market relations, have sharply brought out important inter-relations that call for technical analysis of a very high order...The point here is not only to note that very abstract models might still be of considerable practical relevance – a fact that must be obvious enough. It is also to emphasise that even the oddly narrow characterisation of human motivation, with ethical considerations eschewed, may nevertheless

> serve a useful purpose in understanding the nature of many social relations of importance in economics. (Sen 1987:8-9)

Sen's concern is to warn that reductivist technical approaches may obscure a wider view, especially of human motivation and of social interaction. In the context of poverty studies, it is clear that poverty measured by income or consumption is only one dimension among many and such studies need be mindful of confusing 'ends' with 'means'. For Sen, such measures tell us something about the means to achieving important human functionings, but they are not a measure of standard of living per se which might be better considered in terms of a plurality of capabilities to function (Sen 1983: 160).

These epistemological concerns, in addition to more specific limitations of the approach considered below provide background for the interpretation of the relationships explored through statistical modelling in the primary study.

### 3.4.1 Approach to Quantitative Analysis

The principal sources of data are the Ghana Living Standards Surveys conducted in 1991/2, 1998/9 and 2005/6. The modelling approach adopted employs a range of regression techniques in both single-level and multi-level frameworks, drawing on methodological approaches from econometrics and quantitative social science (applied statistics). The approach taken to the selection of methods and variables is based on fitness for purpose, appropriate literature and data availability and is intended to recognise that methods selected from more than one paradigmatic tradition may offer different insights into a set of related questions.

### 3.4.2 Survey Analysis in the Ghanaian Context

Studies of the relationships between poverty and education at the national level rely on available nationally representative data which include measures of living standards and educational access and attainment as well as appropriate control variables. For causal interpretation, particularly where the evolution of empirical relationships is concerned, data obtained from 'experiments' such as through randomised control trials (RCTs) may be ideal, since variables are manipulated by the researcher and responses directly observed in both a treatment and control group. Clearly such approaches are not possible and would be unethical in this context. A second choice might be a nationally

representative longitudinal survey which permits the observation of changes in key variables for identified individuals and households. Unfortunately such a survey is not available in Ghana and cross-sectional surveys must be relied upon. The key implication is that it may not be possible to rule out alternative explanations of change supported by the data except by appeal to a conceptual framework or to earlier empirical work. Further issues concern the nature of inferences made from the sample to the population, particularly taking into account the survey design and limitations. Some of the limitations of cross-sectional survey data for the intended analysis are considered in the next section.

### 3.4.3 The Ghana Living Standards Surveys

The Ghana Statistical Service (GSS) began collecting data for the first of its nationally representative living standards surveys in 1987. The Ghana Living Standards Surveys (GLSS) collect data at the individual, household and community levels with the aim of measuring levels and changes in living standards and of evaluating and informing policy decisions likely to impact on living standards indicators. The surveys collect a wide range of data and include specific modules on education, employment, consumption and income. They are the principal source of data employed in estimating poverty levels in Ghana.

While the two earliest rounds of the GLSS were designed to be part of an ongoing 'revolving panel' (longitudinal) design (see Twum-Baah and Glewwe 1991: 76), the design was changed for the third round in 1991/2 and thereafter to a simple cross-section due to difficulties experienced in maintaining the panel element of the sample (GSS 1999: 19). This problem may be serious in developing countries more generally including because mobility, dissolution and splitting among households may be common (see Bevan 2001:8), and limitations of resources may preclude frequent survey-rounds being administered. Further difficulties arise regarding longitudinal data to the extent that repeated interviews of a participant may be associated with behaviour change or with an increase in the rate of refusal. However, experience is generally that rates of refusal in developing countries tend to be low when compared with the developed world (Deaton 1997: 20) and indeed are very low in the GLSS (see 3.4.3.1 below).

The key feature of a panel approach is the ability to trace respondent characteristics through time, along with the facility to explore dynamics at the individual level as well as the time-ordering of change, which may prove illuminating for questions of causal relationships. Conversely, a key advantage of the repeated cross-section is its ability to ensure representativeness through time by selecting independent samples, creating a representative time-series. The three rounds of the GLSS employed in this study are then three independent cross-sections which use a highly comparable design (discussed in the next section). The key advantage for the purposes of the study is the maintenance of representativeness over time which permits accurate estimation of national level economic and educational levels and of their determinants at each time point. Interpretation of the dynamics of change is restricted to relatively high levels of aggregation at which the surveys retain reasonable representativeness.

#### 3.4.3.1 Survey Design

A common stratified two-stage design was used in all three rounds of GLSS. According to this method, PSUs are selected within defined strata. In GLSS 3 and 4 the strata were urban/rural location and the three ecological zones in Ghana – forest, coastal and savannah. In GLSS 5, the strata were urban/rural location and the ten regions in Ghana. The census divides Ghana into enumeration areas (EAs) or clusters which consist of approximately two hundred households. In rural areas these are frequently villages but also include groups of smaller settlements and, in urban areas are more densely populated small areas of towns and cities. The sampling procedure selects EAs systematically within strata to provide a representative sample of 300 to 500 depending on the survey round. EAs are selected according to the PPS (probability proportional to size) method. More specifically, EAs are selected using a procedure which involves selection from a list pre-arranged by urban and rural location and forest, coastal or savannah ecological zone using a random starting point and ensuring the probability of selection reflects the size of the EA (GSS 1999: 8). The exception to this is that in GLSS 5, two smaller regions (Upper East and Upper West) were oversampled in order to allow representativeness at the regional level, so that sampling weights are required at the cluster-level. A second sampling frame was then created by enumerating all the households in the sample EAs manually. Thus the method uses implicit and proportional stratification and produces a 'self-weighting sample' in principle in the cases of GLSS 3 and 4.

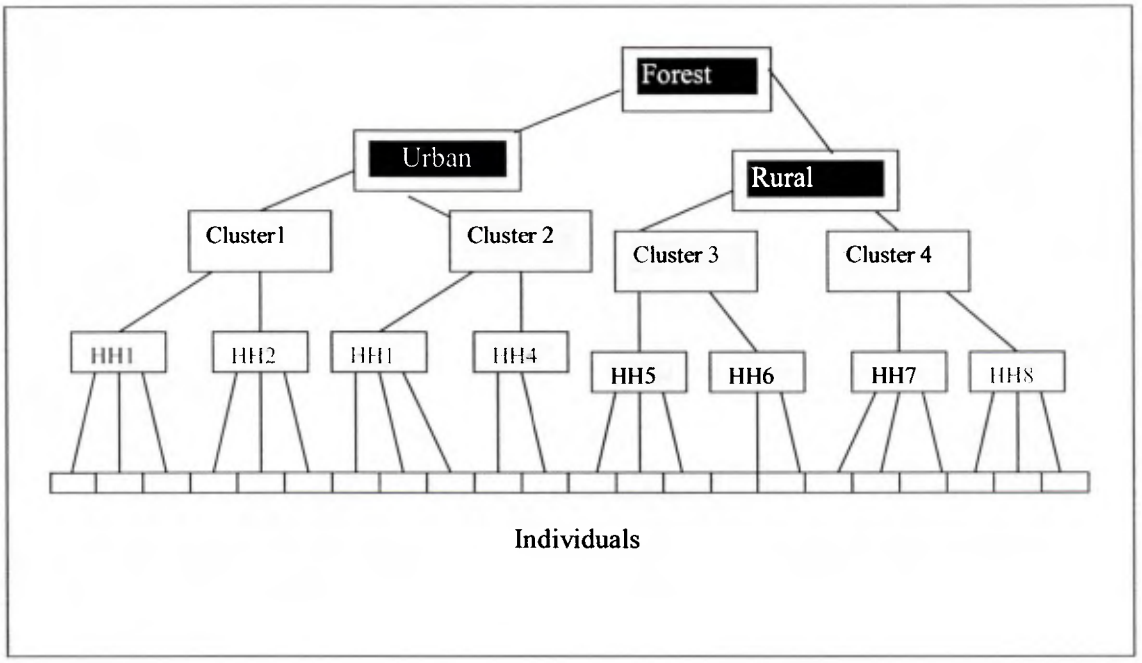
Since each EA is essentially a cluster of households, the two stage procedure produces a 'clustered' sample of households nested within EAs. A sample of approximately 20 households is selected from each sample EA (GSS 1999: 12). The procedure selected a total of 4565 households (approximately 20000 people) in GLSS3, 6000 households (approximately 25000 people) for GLSS4 and 8700 households (approximately 35000 people) for GLSS5. The final samples achieved were 4552 households in GLSS 3, a response rate of 99.71 percent; 5998 households in GLSS 4, a response rate of 99.97 percent and in GLSS 5, 8687 households, a response rate of 99.85 percent. This indicates no serious possibility of bias due to non-response in any of the survey rounds. Figure 3.1 below illustrates how the data is structured, with strata highlighted in black and sampling units in grey.

GLSS 3 and 4 (conducted in 1991/2 and 1998/9) used the 1984 census data on population and households as a sampling frame. Although old at the time, this was the best available sampling frame in Ghana. GLSS 5, conducted in 2005/6, used the more recent 2000 census. In each survey, the household listing exercise at PSU (primary sampling unit) level revealed differences in PSU size between sampling frame and survey, due to population growth and migration. Owing to the length of time which had elapsed between census and survey, these differences were largest for GLSS 4. With the intention of restoring the self-weighting characteristic of the sample, survey clusters which had grown in size considerably were 'segmented', rather than adjusting the cluster-level sample size. A segment of approximately 200 households was selected at random in these clusters. When data from the 2000 census became available (collected one year after GLSS 4 fieldwork), it was possible to use this to retrospectively reweight data collected in GLSS 4 to reflect the population in 2000 more accurately, based on the updated information on cluster-sizes. The use of these weights is not found to change the picture of poverty trends between GLSS 3 and 4 significantly (GSS 2000b:57).

Thus, while no weights are required for analyses using GLSS 3 data, weights are required for GLSS 4 to improve representation of the 2000 population and for GLSS 5 to correct for oversampling in smaller regions. These weights are employed in reporting of descriptive statistics. Considerable debate surrounds the use of weights in regression analysis, particularly multi-level modelling and until very recently multi-level analysis software rarely permitted the use of weights. Where independent variables are included which reflect the aspects of survey design which generate weights

(e.g. cluster, region), as they are in this study, un-weighted models may arguably be preferred, although the issues are complex. Multi-level modelling of GLSS data in this study takes account of sampling design specifically, to the extent that two-stage sampling is reflected in the two-level model and key strata variables are included as predictors. Again, however, the issues are the subject of considerable debate (see Pfefferman et al 1998; Gelman 2007). Weights are not used in regression analyses in this study.

**Figure 3.1: Illustration of data structure in GLSS**




### 3.4.3.2 Measuring Consumption, Income, Welfare and Poverty

A key purpose of the GLSS surveys is to provide information for the estimation of the incidence and depth of poverty. The GSS uses two consumption expenditure (welfare) based poverty lines (see GSS 2007a) - the lower line ('extreme poverty') being defined at a level of 700,000 Cedis at January 1999 prices in Accra and the upper line at 900,000 Cedis. These lines are intended to reflect levels of expenditure required for basic food and non-food subsistence expenditure in the first case and food subsistence only in the second. Accordingly, they are nutritionally-based by being linked to calorific requirements. 'Welfare' is defined as a 'per equivalent adult' money-metric measure of the value of household consumption expenditure divided by the number of equivalent adults in the household, calculated on an age-related calorific needs scale

(see Appendix D1). It is especially important to reflect the differences in calorific requirements of household members in constructing measures of standards of living, owing to the large food shares in consumption expenditure in Ghana. On this measure, each individual is represented as having the standard of living of the household to which they belong. The welfare measure includes the value of all household consumption expenditure including both food and non-food items (and education).

The measurement of expenditure, and incomes, requires a data-collection design that adequately reflects patterns of economic activity over time (seasonality), which attends to the potential for 'recall-error' and which accounts for regional and temporal fluctuations in prices. The GLSS surveys collect data over a period of twelve months, to take account of seasonal variations in consumption and incomes, which are an especially important issue in a predominantly rural economy such as Ghana's. Incomes and expenditures are recorded in current prices and are corrected using information from a price questionnaire and from the Consumer Prices Index (CPI), as explained below. Nonetheless, since the fieldwork design ensures that data are collected in all socio-economic strata across the year, differences may 'net-out' in summary statistics aggregated at the stratum level. In the first two GLSS surveys (GLSS 1 and 2), households were visited twice only, with an interval of two weeks in between. Data on a list of food and non-food expenditure items were collected on the second visit, giving a recall period of two weeks. In order to reduce 'recall error' for the GLSS 3 and subsequent surveys, however, much more frequent visits were made to households. In rural areas, households were visited eight times at two-day intervals. In urban areas they were visited eleven times at three-day intervals (see GSS 1995b). A reduction in the recall period from two weeks to two or three days may be expected to reduce recall error significantly. In urban areas, households were asked to keep a diary of consumption expenditure over the data-gathering cycle. A literate household member was identified and trained to keep the diary on the first visit to the household. Where no literate member could be identified, households were visited on a daily basis (GSS 1990b). In rural areas, where it is much more difficult to identify literate household members, diaries were not used, but instead households were visited at shorter intervals to minimise recall error. A further reason for the different patterns of data collection between urban and rural areas is to ensure that in urban areas, where many household

members receive monthly wages, the day on which wages are received is included in the period covered.

Although the household data-collection cycles are 16 and 35 days respectively (the last two-days are reserved for checking and administration) in rural and urban areas, efforts are also made in GLSS 3-5 to record household expenditure continuously from a sub-sample of households within each cluster to account for seasonality. One interviewee was designated to train a local person for this purpose, who attended the household interviews in the cluster during the fieldwork period. Once the survey team had left, that person recorded daily expenditures for a sample of nine households in rural areas and fifteen households in urban areas. A rotating sample of three households was visited in 22 cycles across the year in rural areas and 11 cycles in urban areas (so that, for example, in rural areas households 1, 2 and 3 were visited in the first, fourth and seventh cycle and so on; and in rural areas they are visited in the first, sixth and eleventh cycles and so on) (see GSS 1990b). This longitudinal exercise captures monthly variations in expenditure patterns at the cluster level and allows expenditures and incomes to be annualised more accurately.

A price questionnaire was administered in each round of the GLSS to allow for corrections for costs of living by area. Prices for a basket of goods were collected in local markets and these are used to construct regional price indices which are used to take account of regional variations in purchasing power when calculating consumption expenditure (GSS 1995b). The basket of goods included key food and non-food items, concerning which survey fieldwork supervisors obtained prices from three local traders. Food items were weighed by the supervisors (see GSS 1990b). These corrections are important due to wide variation in local prices for certain goods – most notably housing costs which, in the Upper West region, for example, are less than half of those in Accra.

The 'welfare' variable computed from nominal consumption expenditures is thus corrected for seasonal fluctuation in expenditure, household size and composition, and for local level differences in price levels. In addition, to account for changes in prices during the administration period of the survey, the Ghana Consumer Price Index (CPI) is used to deflate/inflate (depending on when the data were collected) all values to the mid-point of the survey period. In GLSS 3, the national CPI figures for food and non-food items separately are used (see GSS 1995a, GSS 1999a). While this index does not

reflect regional differences in inflation, these were found to be small at the level of the sampling strata (see GSS 1995a). Improvements were made for GLSS 4 and 5 in that the CPI and regional prices data are used to reflect differences in inflation during the survey period between five area groupings – Accra, other urban areas, rural coastal, rural forest and rural savannah areas (see GSS 2000b).

In order to allow comparability between survey rounds, consumption and income values also require correction for inflation between the survey periods. Differences in nominal figures are very large. For example, recorded mean incomes rose 555% between GLSS 3 and 4 and nominal consumption by 629% (GSS 2000c). A price deflator index (based on the Paasche cost of living index) was constructed on the same basis as that for within-survey inflation in GLSS 4 and is used to 'rebase' monetary values from all three surveys to the level of January 1999 prices of Accra. The welfare values calculated on this basis are used by the GSS (and in this study) for comparing poverty levels over time.

The data used for the estimation of household consumption expenditure from the GLSS 3 and 4 surveys are summarized in Appendix D2 and are discussed in detail in GSS (2000c). Expenditure on 120 food, beverage and tobacco items are included alongside two groups of non-durable non-food items (frequently and less-frequently purchased) plus expenditure on utilities and education. In addition, values are imputed for the consumption of food from own production and for wages received in the form of food (evaluated by respondents at current market prices). Values are also imputed for consumption of durable goods in the form of 'user-values' equivalent to the annual depreciation values of these capital assets, for consumption of own non-farm outputs and for wages paid in-kind, other than in the form of food or housing. Housing expenditure is included based on actual rents or, in the case of owner-occupied dwellings, is imputed using a regression equation. This 'hedonic equation' regresses observed rental values of dwellings on indicators of their characteristics and amenities to provide estimates for dwellings on which no rent is paid. Subsidized housing is included as a separate category, treated as transfer-income paid in-kind. Clearly, in the context of developing countries with predominantly agricultural economies, the imputation of values for own-production is essential to measuring consumption.

Income data from the GLSS surveys employed in this study are collected in five major categories – incomes from employment, agriculture, non-farm self-employment, rents and remittances. Annualised figures are provided by GSS based on aggregation calculations using the reference periods recorded for each income component (see GSS 2000c). Income data are not recorded continuously, however, in the manner used for consumption. Where hourly wages from employment are used, these relate to annualized figures divided by annual hours worked, calculated from reports of weekly hours worked and annual weeks worked. On this basis, income data may be considered potentially subject to greater measurement error than consumption data, due to recall bias.

With regard to income sources more specifically, employment income is calculated as the sum of employee compensation either in cash, in kind or imputed, whether in a commercial enterprise or the family activity of another household. Imputed values include values for income received in the form of free or subsidized accommodation, based on the hedonic equation described above. Agricultural incomes are defined as incomes from the sale of cash crops and livestock products plus imputed values for own-consumption of homegrown produce, minus input costs of agricultural activity including wages to non-household members and an allowance for depreciation of capital assets. Non-farm self-employment incomes include incomes from all non-agricultural forms of self-employment, calculated on the same basis. This income may also be estimated from questions on profits from non-farm enterprises. Rents include incomes from leasing land, equipment, buildings and dwellings, with imputation for owner-occupied dwellings. Remittances include transfers in the form of cash and goods plus imputations for subsidized accommodation. The components of income and consumption and the methodology used for calculating the aggregates are discussed in detail in GSS (2000c).

#### 3.4.3.3 Discussion of Design and Measurement Issues

Clearly, a sampling frame from 1984 is an imperfect one. The manual listing of households for each survey round, provided it is done accurately, does, however produce a very up to date second sampling frame. Unfortunately, the GSS reported that the listing exercise was not always thoroughly completed (GSS 2000a: 115). For example, difficulties arose in that larger EAs had to be 'segmented' to provide viable

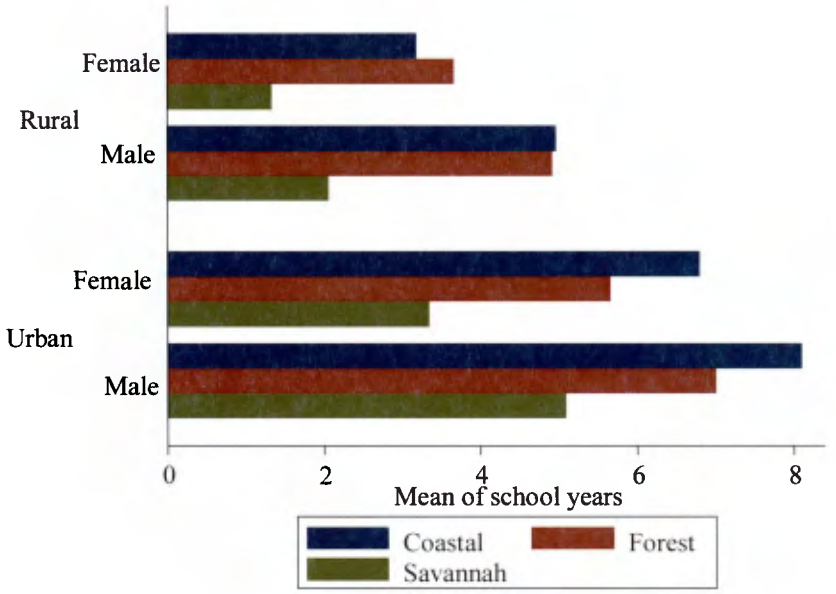
workloads for data collection and the GSS noted that segmentation was sometimes done in a rather arbitrary way which may have compromised the representativeness of data from a segment (GSS 2000a: 115). This might be supported by the existence of apparent inconsistencies of enumeration between GLSS data and community level records such as school registers (Scott et al 2003: 22). A further more general enumeration issue arises for the household-level exercise owing to the difficulty of ensuring coverage of individuals living outside conventional household settings including those in the armed forces, those living in institutions, the homeless pastoralists and itinerant populations (Deaton 1997: 10). Bevan (2001: 8) comments that the highly diverse livelihood systems, particularly of rural areas in developing countries along with the range of culturally-embedded and dynamic household types makes a geographical frame problematic in these settings.

Nonetheless, stratification of the sample may be expected to increase the reliability and precision of information produced by the survey if the strata are appropriately selected on the basis of known stratum characteristics which relate to the parameters the survey is designed to estimate. This is clearly the case in GLSS where living standards are concerned. Consumption, income, employment, educational and many other indicators do vary considerably according to ecological zone and urban/rural location in Ghana, with coastal and urban locations generally showing the most positive figures (see GSS 2000b). This is illustrated in Figures 3.2 and 3.3 using GLSS 5. Where there is a high degree of homogeneity within strata and a high degree of heterogeneity between them, stratification recognizes a structural feature of the data and reduces the errors of estimation relative to a simple random sample (SRS) (see Cochran 1977). Further, more accurate estimates can be made for data subsets defined by the strata.

Clustering in survey design is most appropriate statistically when the randomly selected cluster elements are internally heterogeneous but when there is homogeneity between clusters, so that clusters are not systematically different from the population. Where there is a high level of inter-cluster homogeneity, a relatively small number of clusters may be sampled but where they are heterogeneous, a small sample of clusters may omit clusters which are significantly different from those sampled and so there needs to be a larger sample of clusters (Scheaffer et al 1996: 292). The small size of EAs in the GLSS, often representing one village, may make them relatively internally homogeneous and would suggest the need for a large sample which the GLSS survey

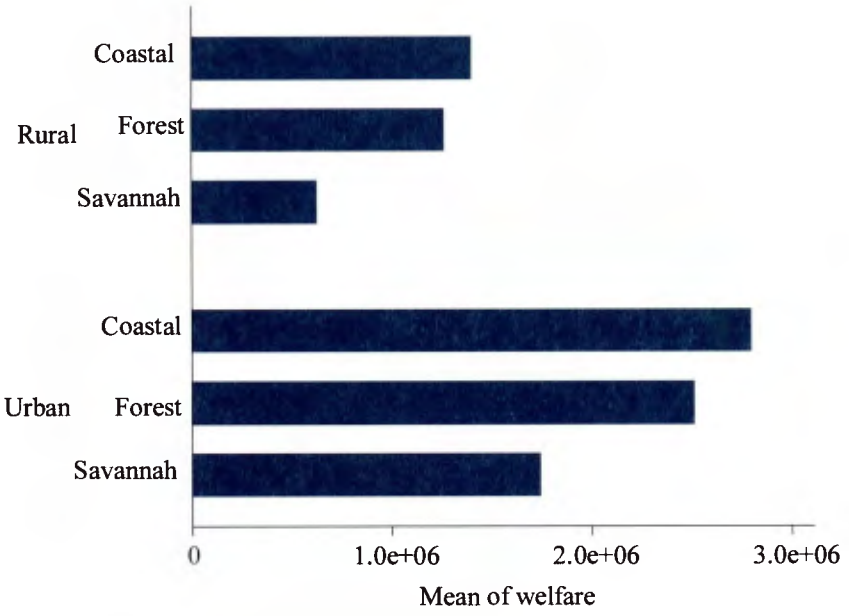
achieves with the inclusion of 300 to 500 EAs. Nonetheless, the effect of clustered sampling is likely to reduce the reliability of estimates relative to a SRS, since it will not sample from as wide a range of EAs, and will reflect to an extent the characteristics of the sampled EAs rather than the population, since observations within a cluster are not strictly independent. Deaton notes that in household surveys more generally, as in Ghana, practicality (and cost) predominates in design decisions since despite the potential for reducing variance through stratification, "estimates of the means of most variables in stratified clustered samples have 'design effects' (Deffs) that are greater than one" (Groves 1989 cited in Deaton 1997: 15). These 'design effects' denote the ratio of the variance of an estimate from the survey of interest to that produced by a comparable SRS. As well as the general effect of cluster sampling on Deffs, we may expect Deffs to be higher for variables which the chosen strata are less appropriate.

**Figure 3.2: Average adult years of schooling in GLSS 5 by gender, ecological zone and urban/rural location**




Source: Computed from GLSS 5 data

**Figure 3.3: Average household consumption (economic welfare) in 1999 Cedis in GLSS 5 by ecological zone and urban/rural location**




Source: Computed from GLSS 3-5 data

Clearly, although focused on living standards, the GLSS also serve as a general household survey, but it is important to note that precision of estimates from the GLSS will be partly related to the consonance between the original survey purpose and the analyst's research question. Table 3.1 below reports 'design effects' for selected variables in GLSS 1 and 2 calculated by Temesgen and Morganstein (2000) which show that reliability of estimates produced by the GLSS when compared to an equivalent SRS is up to 5 times lower.

**Table 3.1: Examples of design effects in GLSS**

| | **Per capita consumption** | | | **Access to healthcare** | | | **Unemployment** | | |
|---|---|---|---|---|---|---|---|---|---|
| | All | rural | urban | All | rural | urban | all | rural | urban |
| **1987** | 1.9 | 3.1 | 1.8 | 2.9 | 3.0 | 5.0 | 1.7 | 1.5 | 2.0 |
| **1988** | 3.2 | 2.9 | 2.9 | 2.2 | 2.5 | 3.6 | 1.3 | 1.1 | 1.4 |

Source: Temesgen and Morganstein (2000)

The measurement of consumption is a primary aim of the GLSS surveys and considerable efforts are made to ensure accuracy. Nonetheless, the estimation of consumption is highly complex and there is considerable scope for error. The short

recall periods used in GLSS 3 to 5 are encouraging. Casley and Lury (1987:79) argue that

> A guiding principle, therefore, must be to keep the recall period as short as possible...a very short recall period such as one day or three days may be appropriate for the recording of consumption patterns but will give rise to high variation in the data.

This last point is addressed in the GLSS, however, through the use of frequent visits to the household over appropriate reference periods. These periods are also designed to address the concern that "the true daily variation in food expenditure by a household is high, since purchased may range from zero to a figure that on payday may be as high as the total for the preceding week" (Casely and Lury 1987:79). On the issue of recall error, in the Ghanaian context, a study by Scott and Ameuvegbe (1990) found that, on average, respondents 'forgot' 2.9 percent of daily expenditure for each day by which the recall period was lengthened, between one and seven days. On this basis, one might expect up to nine percent downward error in GLSS 3-5. In addition to these issues, the GLSS data contain a large number of estimated consumption values, based on auto-consumption. Deaton (1997:28) argues that

> In much of West Africa...some markets are not well-developed, and where home production and hunting may account for a large share – perhaps more than a half of total consumption. In cases where prices are available, and where the items being consumed are similar to those that are sold nearby, imputation is not difficult...where there are differences in quality, or where the item is rarely sold, some prices must be imputed, and the choice is nearly always difficult.

While the GLSS does not use imputation for these values, the practice of collecting price data from respondents on these items may also be considered subject to analogous error, especially where items are rarely sold. In general, measurement error is likely to be introduced when imputation (or such estimates) is used for a large fraction of total consumption. This will be the case in the GLSS where household consumption is dominated by auto-consumption, which is likely to include a large proportion of the poorest households. Accordingly, such measurement error may be non-random. In general, the positive skew of the distribution of consumption may be associated with under-estimation of mean values (see Deaton 1997:30).

These issues apply for the most part to income measures too. Moreover, income is a more sensitive topic than consumption and the GLSS do not include continuous measurement of income as is done for consumption. As Deaton (1997:29) argues,

> All of the difficulties of measuring consumption – imputations, recall bias, seasonality, long questionnaires – apply with greater force to the measurement of income, and a lot of additional issues arise.

In the case of the GLSS, the absence of continuous measurement suggests that issues of seasonality and recall especially may be more serious than for consumption. Moreover, in the case of self-employment and agricultural incomes particularly, there may be a tendency for households to underestimate, due to confusion between business and personal incomings and outgoings. Again, such under-estimation may be expected to be more serious where incomes from these activities are low, especially where incomes and costs are received in kind and monetary values have to be estimated by the respondent.

The large change in nominal values of consumption and income over the period covered by GLSS 3-5 necessitates the use of a reliable price index for inflation/deflation. The GSS community price data collected at every survey cluster may be considered a detailed basis for correcting for price differences between sites during the survey periods, but the correction for change over time depends on much less location-specific data – the CPI, so that differences in inflation by location, except at the level of 5 broad groupings for GLSS 4 and 5 are not accounted for. An additional measurement issue concerns the use of the 'equivalent adult' value for the creation of per-capita consumption measures for the household. While this approach is appropriate for food-expenditure, it is also applied to non-food expenditure, while non-food requirements may not vary between household members based on age and gender, in which case the measure may overestimate consumption per capita for larger households.

The possible presence of non-random or non-classical measurement error, specifically greater amounts of measurement error at the lower end of the distribution of the welfare variable in this case, is a limitation of the GLSS data which should be borne in mind with regard to the analyses that follow. The effect of underestimation at the lower end but not at the upper end of the distributions of income and consumption would, for example, potentially inflate measures of inequality, by artificially widening the gaps between the two ends of the distribution. It could also exaggerate (bias) effects of explanatory variables in regressions using income or consumption as an outcome, depending also on the nature of measurement error in the explanatory variable itself,

and any correlation between the measurement errors in dependent and independent variables.

#### 3.4.3.4 Limitations and Issues for Data Analysis

Issues of data reliability need to be borne in mind, particularly when considering the extent to which GLSS data may be disaggregated for analysis. Inferences about smaller population units are likely to be rather imprecise when using GLSS data. Equally, the data may not be adequate to consider with confidence the magnitude of small changes between survey rounds, especially for smaller geographic units. Specifically, the data are designed to be representative at the level of the ecological zone (region in GLSS 5), so that while samples at the regional level are relatively large, interpretation of regional estimates requires caution, with the exception of GLSS 5. Indeed some of the results found for regions appear to be affected by sampling issues. Moreover, pooled cross-sectional data may lead to a confounding of temporal effects with cohort effects. Survey design in the GLSS has implications for the standard errors of estimates as discussed above, which may be expected to be larger than in a comparable SRS. When compared with a longitudinal survey, the availability of within-household as well as between-household data on change in a longitudinal survey increases the statistical precision of estimates relative to a repeated cross-section, particularly where the degree of inter-temporal auto-correlation among household variables is relatively high (Deaton 1997: 20; Berger 1986: 180). Where macro-level change is slow and inter-temporal auto correlation high, a repeated cross-section with a moderate sample size conducted at frequent intervals is likely to produce statistically insignificant estimates of change which are dominated by measurement error. Fortunately, the three GLSS surveys span a period of fifteen years during which educational and economic change and development were relatively rapid in Ghana.

Apart from reliability, questions also arise in relation to the validity of household survey results to the extent that many survey question items rely on particular constructions of the phenomena being investigated. Issues relating to the conceptualisation of living standards based on survey data on money-metric consumption were discussed above in relation to Sen's (1987) work and more generally in Chapter 2. A further issue relates to the construct of a 'household'. For example, in the GLSS this is conceived of as the

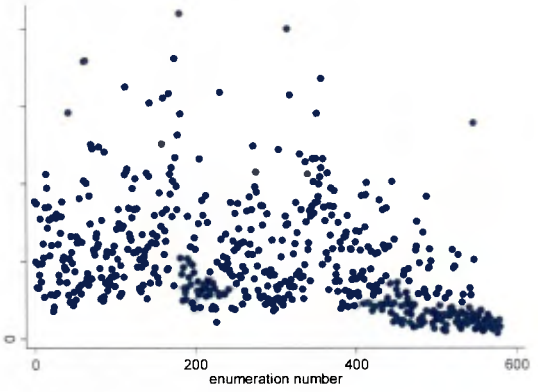
main unit of resource-sharing but the use of this construct neglects inter-household resource sharing and its effects on welfare levels (see Bevan 2001: 7-8).

A further key potential limitation relates specifically to the construct of 'household welfare'. The narrowness of the expenditure-defined construct has been highlighted but in addition it is notable that educational expenditure is included in 'welfare' which may be considered to violate the assumption in human capital theory that education is pursued as an investment, although it is not unreasonable to assert that education have some consumption/utility value. Moreover, if levels of education or indeed other explanatory variables like region of residence are associated with unobserved preferences which affect choices between work and leisure, or if leisure is considered to add to 'utility' of itself aside from the consumption of goods and services, there will be a degree of compromise in modelling 'welfare' or indeed 'poverty' on the basis of household expenditure. Equally, education and control variable constructs are also imperfect approximations and are reported with a degree of error by questionnaire respondents. In particular, differences in educational quality are difficult to measure (see Tickly 2011).

### 3.4.4 Methodological Issues: Accounting for Data Structure in the GLSS

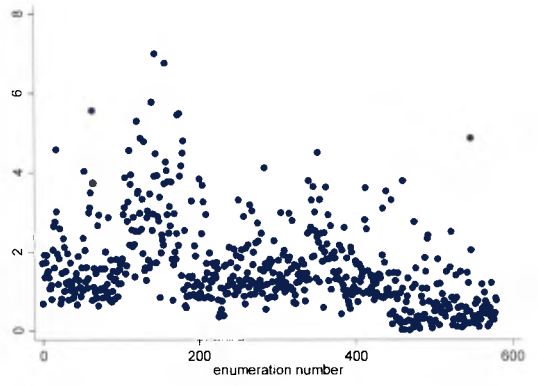
As has been highlighted, the clustered nature of the GLSS survey design requires at least that routines be employed to correct (inflate) standard errors of estimates. In addition, modelling may also attempt to exploit or take account of the substantive effect of clustering; that is the effect of cluster level factors rather than the nuisance induced by sampling convenience. If data are clustered into meaningful units such as villages, then intra-cluster correlation may be in part the result of latent cluster-level factors including local levels of development or labour market opportunities. Figures 3.4 and 3.5 below illustrate the relatively high level of clustering in relation to household education and particularly welfare levels. Figure 3.6 illustrates the positive correlation between them.

**Figure 3.4: Distribution of cluster means of household welfare (in 1999 Cedis) (GLSS 5)**



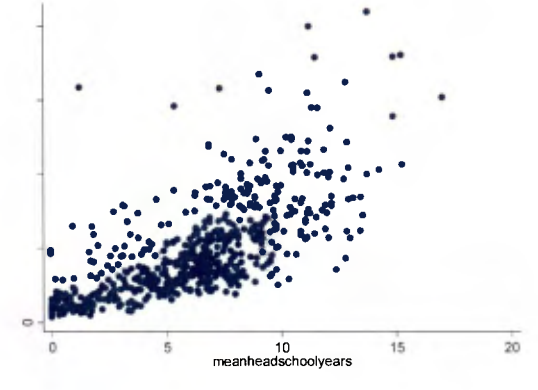

Source: GLSS 5 data

**Figure 3.5: Distribution of cluster means of the household head's completed years of education (GLSS 5)**




Source: GLSS 5 data

**Figure 3.6: Correlation between cluster means of household heads' years of schooling and welfare (GLSS 5)**




Source: GLSS 5 data

Several methods exist for dealing with the substantive effect of clustering, considered more formally in the technical appendix (Appendix B). Perhaps the simplest is the 'cluster fixed effects' approach which estimates 'within cluster' effects of explanatory variables, removing between-cluster variation. Where interest is specifically in differences in the effects of individual characteristics, the 'fixed effects' approach is usually most appropriate. An alternative approach models cluster effects as 'random effects' taken from a population distribution to reflect the fact that clusters are a sample from a wider population of potential selections (see Littell et al 2002: 92). Table 3.2 below summarises the key differences and benefits of the alternatives and relates these to the GLSS data.

Since inference in national survey data is usually intended to be the population rather than to the selected clusters, a 'random effects' approach may be appropriate. A sufficient sample size of clusters is available and there also sufficient observations per cluster. It is also useful to be able to estimate both within and between cluster effects as the 'random effects' model permits. The estimation of the effects of cluster-level covariates requires a multi-level approach as discussed below but is based on a 'random effects' model. The main disadvantage of the 'random effects' approach consists in the relatively strong distributional assumptions made in relation to the normal distribution of cluster-intercepts, their constant variance and their exogeneity with respect to explanatory variables in the model. These assumptions are considered further below and tested in the modelling procedure adopted.

**Table 3.2: Overview of distinguishing features of fixed and random effects approaches**

| Questions: | Answers: Fixed Effects | Random Effects | GLSS |
|---|---|---|---|
| Inference for population of clusters | No | Yes | Yes |
| Minimum number of clusters required | Any number (2+) | For estimating variance of random intercept at least 10 or 20 estimation is better with more | 300-500 available |
| Assumptions (cluster level) | None for distribution of fixed intercepts (standard linear model) | Random intercepts normal, constant variance, exogenous covariates | RE requires checking assumptions |
| Estimate effects of cluster-level covariates? | No | Yes | Desired |
| Inference for clusters in particular sample? | Yes (within cluster effects) | No, not for covariates<br><br>Yes for random intercepts using Empirical Bayes | Not required for covariates, inference to population |
| Minimum cluster size required | Any sizes if many are > 2 but larger if estimates of cluster fixed effects required | Any sizes if many are >2 | Ranges mostly 15-40 households |
| Is the model parsimonious? | No, one parameter for each cluster but can be eliminated | Yes, one variance parameter for all clusters | RE more parsimonious if many clusters. |
| Can estimate within-cluster effects of covariates? | Yes | Yes, by including cluster means | Desired |

Source: adapted from Rabe-Hesketh and Skrondal (2008: 124)

### 3.4.5 School Quality Measures: EMIS Data

Since the GLSS surveys do not collect data at school-level, important supply-side data, especially relating to school quality, are not available. For 2001 to 2009, the Ghana Ministry of Education EMIS statistics are available at the district level. The database contains quantitative indicators of enrolment, infrastructure and school quality proxies including pupil teacher ratios, examination pass rates and textbook availability collected from a majority of schools in Ghana. Unfortunately only the GLSS 5 data contains district codes which allow matching of clusters with the corresponding EMIS district. Where appropriate, these indicators have been included as supply-side variables in modelling exercises.

### 3.4.6 Multi-Level Models

'Multi-level modelling' extends the basic 'random effects' approach to model the distribution of higher level effects in a nested data structure, such as cluster effects. Distinct and substantive levels within data sets give rise to separate sources of variability with the resultant possibility of error in analysis arising from the 'ecological fallacy' where analysis proceeds only at higher levels (Robinson 1950). If correlations increase by level of data aggregation, the potential fallacy lies in interpreting aggregate relationships to be applicable at the individual level. Conversely, analyses which focus only at the individual level may emphasise 'within group' variability while neglecting differences between groups. For example, where poverty is 'clustered' at village level and analysis proceeds only at household level, household factors may be overestimated if clustering is not addressed; a form of omitted variable bias. Multi-level modelling is made possible by a data structure which constrains the variance among observations through nesting within a hierarchy. In the case of households nested within clusters, the total variance in a household-level characteristic in a particular cluster must, of necessity, be less than or equal to the variance within the population of clusters.

The development of 'multi-level analysis' has enhanced the capacity of regression models to simultaneously account for sources of data variability within hierarchical data sets. According to Snijders and Bosker

> the basic idea of multi-level analysis is that data sets with a nesting structure that includes unexplained variability at each level of nesting...are usually not adequately represented by the probability model of multiple linear regression analysis but are often adequately represented by the hierarchical linear model.
> Snijders and Bosker (1999:6)

The 'hierarchical linear model' is the basis for multi-level analysis and may be most simply distinguished from the usual linear model in that it has more than one error term – one for each level within the data set. Allowing the error term to vary at group level provides for modelling of differential group effects which is of particular interest if the groups are non-arbitrary units (such as villages) which may be important determinants of the outcome variable. Figure 3.7 below illustrates Snijders and Bosker's point that

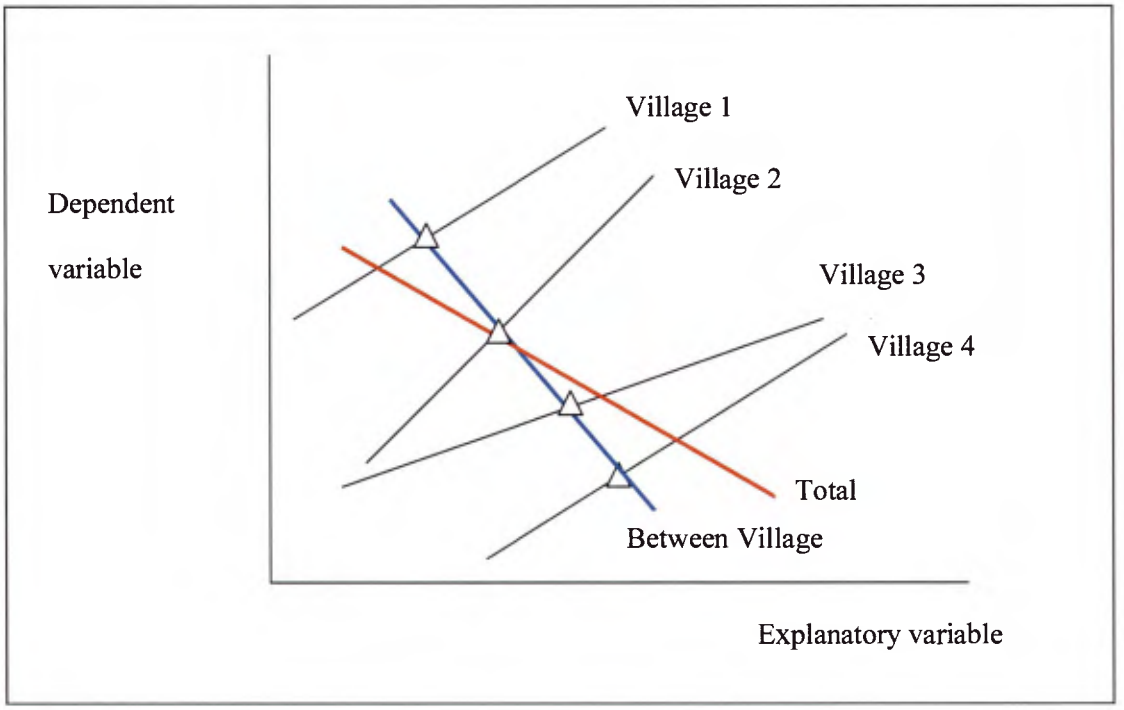
> if the macro-units have any meaningful relations with the phenomenon under study, analysing only aggregated or only disaggregated data is apt to lead to misleading and erroneous conclusions Snijders and Bosker (1999: 16)

In this hypothetical example, the within village relationships between outcome and explanatory variable are positive and vary by intercept and slope. The between village relationship; defined by the blue line through the village-level mean values; is negative but rather steeper than the total relationship shown in red which takes account of both the individual-level values and their within-group clustering. The key point is that observations at village level are not mutually independent since they are related to village-level characteristics. The more alike observations are at village level, the less 'individual' information is contained in each observation and the greater the 'group effect' or, more formally, the higher the 'intra-cluster correlation co-efficient' (ICC).

Goldstein (2003: 3-4) argues that multi-level modelling is not only statistically efficient with regard to survey data since corrections for design may not be required, but also that it is likely to be more informative by modelling group heterogeneity directly. Since in clustered survey designs the clusters for which data are available are themselves a sample from a wider population, multi-level modelling allows the estimation of population-level 'cluster-effects', with associated errors. Knowledge of the extent of variability at cluster-level allows a multi-level model to provide more reliable estimates for smaller areas by 'correcting' values computed on the basis of relatively few actual observations for an area by 'borrowing strength' from the estimation of variability using the entire data set on the assumption that this variability follows a known (typically normal) distribution. This key advantage of the approach is well illustrated by Snijders and Bosker (1999: 60) in their discussion of the relationship between estimates of 'cluster means' and the 'grand mean'. Multi-level modelling corrects the raw estimate for a cluster mean value by 'shrinking' to the grand mean in accordance with the estimated reliability of the cluster value, determined by the number of observations for the cluster and the extent of intra-cluster correlation. Accordingly, where correlation and the number of observations are relatively high, estimated cluster means may vary significantly from the 'grand mean'. The approach is intended to produce reliable estimates of the distribution of the population of group effects, although this approach is not uncontroversial especially where cluster sizes are unbalanced, which is not a particular problem using GLSS (see Tate 2004 for a discussion of the issues) or where it may compound measurement error regarding contextual effects and cluster-level variance, especially if the number of cluster-level observations is small (see Grilli and Rampichini 2009). Improved reliability of group-estimates also has applications in

fields such as 'small area estimation' (see Pfefferman 2002) permitting, for example, the production of detailed poverty maps with fewer observations than would be possible with conventional approaches.

**Figure 3.7: Illustration of within and between group effects in clustered data**




Source: Adapted from Snijders and Bosker (1999: 27)

In multi-level modelling, the hierarchical linear model is combined with the inclusion of additional predictors which characterize the higher level structures. These predictors reflect the fact that grouping is rarely a causally neutral phenomenon but that causes may be latent and unobserved. Cluster effects, for example, may reflect unobserved cluster level economic opportunities or any number of other latent factors. If cluster-level data are available or if it is appropriate to construct 'contextual variables' by aggregating individual level data, it is possible to explore possible explanations of the range of cluster effects, using multi-level analysis to estimate determinants of the distribution of inter-group effects. Contextual variables are computed from individual level observations within a group and can include, but need not be limited to, means, medians and variances. In an example, a contextual variable in GLSS could be the mean household size in a cluster. This might be an important determinant of cluster intercepts in predicting economic welfare. The greater explanatory sophistication of the multi-level approach is then a result of its ability to model random intercepts (common

group effects) and slopes (variation at cluster level in the effects of covariates) by cluster as well as to model interactions between variables across levels, thereby combining the information available in both aggregated and disaggregated data analysis.

Nonetheless, the inclusion of contextual variables constructed at cluster-level from individual-level data may introduce an additional source of measurement error into a multi-level model, and in turn this measurement error may have the consequence of introducing bias on estimates of cluster-level parameters. The issues surrounding this bias are examined in detail using longitudinal data from a UK longitudinal dataset – the Junior School Project (JSP) in Goldstein (2011:271) and Woodhouse et al (1996). Measurement error in aggregated contextual variables arises in particular from differences between cluster samples and the populations they are selected to represent – for example between cluster sample means compared to cluster population means. This measurement error is additional to the possible error in the variable being aggregated. The potential for this kind of measurement is especially high if the cluster size is low and the intra-cluster correlation (ICC) on the variable of interest is low (see Kravdal 2006), since in these cases the amount of information about the cluster population in the available sample is relatively small.

Kravdal (2006) uses Monte Carlo simulations on DHS data from sub-Saharan Africa to examine the impact of measurement error on bias in relation to a contextual variable for average education among women in survey clusters, when modelling the determinants of the timing of first birth in a discrete time hazard model. His experiments find that measurement error produces attenuation bias on the education co-efficient of up to 14 percent in random samples taken from a large cross-country sample. Using single country samples, he found the attenuation bias to be small when cluster sizes were larger than 25 and the ICCC above 0.2. In Ghana, cluster sizes are typically slightly smaller, but the ICCC for household welfare is notably higher. Accordingly, attenuation bias due to measurement error among contextual variables in multi-level models using GLSS data should be acknowledged, while it may be expected to be relatively small, if not non-negligible.

'Random slopes' are estimated by allowing the coefficient on a particular explanatory variable ordinarily treated as a fixed effect - such as the household head's education to vary across groups. The result is to produce a distribution of, for example, group-level

education effects with a mean and a variance. Education is not itself treated as a random factor but education co-efficients are permitted to vary according to the random grouping factor so that it is assumed that group education effects in the sample are drawn from a wider distribution in the population. It may be that the researcher suspects that latent phenomena at the group level may lie behind the difference in group education effects. These are not properly described as pure education effects; and education itself remains conceptually a fixed effect. Rather, they may be conceived as interactions between education and unobserved variables at the group level. This approach, although conceptually similar, is not equivalent to modelling interactions between education and group dummies in a single level fixed effects approach which would require a separate interaction term for each group and would use only the observations from a particular group to estimate the co-efficient on the interaction term. The multi-level approach produces an estimate of the range of slopes by group in the population which again 'borrows strength' from available information about the population. The alternative single-level approach to GLSS data would require more than 1200 cluster dummies for the pooled model and potentially thousands of interaction terms. In addition to making the model extremely cumbersome, interpretation would become incredibly complex. Equally, the small sample size (approximately 20) for each cluster would make estimates unreliable. Cross-level interaction terms, also a potential feature of the multi-level approach, serve to capture the relationship between an individual and a group characteristic. They are indeed implied when contextual factors explain variability in slopes and intercepts by group. In an example, if the average level of welfare by cluster is found to play a role in explaining the variation in cluster slopes on the effect of education, the implication is that there is a cross-level interaction between cluster-level economic conditions and individual level education (see Bickel 2007).

The complexity of group effects in social settings may therefore be such that unless exhaustive data are available, a distribution of random effects may be the better modelling choice where omitted variables are likely to have the effect of causing intra-group homogeneity. This is of course a conceptual and empirical question as well as a statistical one, which depends on features of the data in relation to the research question to be addressed. As noted in Chapter 2, for example, Baschieri and Falkingham (2007) found that community factors reflected in clustering were key determinant of schooling

participation. While this is not unexpected, since local employment opportunities and school availability will clearly influence school attendance, it is the use of multi-level analysis which allowed their study to offer some indicative quantification of effects at this relatively high level of data disaggregation and which improved the accuracy of estimates of more general effects. Nonetheless, Gorard (2007: 232) sounds an appropriate note of caution in relation to the potential for multi-collinearity where closely related variables are introduced at different levels and in relation to the potential for interpretive confusion. It is essential to be led by parsimony and appropriate theory if to avoid barren empiricism. Equally, available data frequently impose limitations on the ability to model complex variation and interaction. Nevertheless, where appropriate, the approaches considered have the potential to reduce the extent of residual intra-cluster correlation by explaining group effects and may also improve explanation of variance at the individual level when compared to a single-level approach.

Hence, recognition of local factors, often associated with the extent of economic development in the education-consumption relationship is crucial. An early study by Hanushek concludes that:

> The value of education or other inputs cannot be described by a single statistic but instead appear to be a function of the geographical area in which one lives. Considering major metropolitan areas as separate labor markets, one finds significant variation in the returns to human capital across labour markets. This implies that past analyses of the returns to schooling, ability and experiences will be very dependent upon the geographic distribution of the individuals in the sample and, thus, upon the specific aggregation of relationships for different labour markets. (Hanushek 1973: 212)

The recognition that observations of household consumption are strongly correlated geographically even after controlling for key explanatory factors in a single level approach amounts to a recognition of a serious weakness of the approach. In a multi-level model, however, treating this residual correlation as a continuous latent variable permits the recognition of a distribution of constellations of contextual factors which, although not observed directly, are hypothesized to intervene in the relationship between education and the realization of its economic benefits. This is why Bickel argues that

> Seminal affirmations of human capital theory have placed near-exclusive emphasis on characteristics of individuals...with rare exceptions, consequences of investments in oneself have been treated as independent of variability in the social, political and economic contexts in which people are located...if ever there were a theoretical perspective that demanded emphasis on nesting, human capital theory is it. (Bickel 2007: 17)

#### 3.4.6.1 Endogeneity Bias in Multi-Level Models

Even if interest is primarily in a population of higher level effects and if these effects appear to be normally distributed, an important consideration remains in determining whether higher level factors are appropriately treated as randomly distributed in regard to possible endogeneity. If it is the case that higher level (e.g. cluster) effects are correlated with explanatory variables in the model rather than only with latent effects, then the random effects approach may lead to biased estimation of the explanatory variable co-efficients. The problem may be construed as an omitted variable issue. For example, a correlation between cluster-level effects or residuals and education levels in a household consumption equation may be due to the non-random distribution of employment opportunities.

An important reason for preferring 'fixed effects' approaches to 'random effects' in many applications is that in the fixed effects approach, estimates are not susceptible to this kind of endogeneity bias. This is because the approach estimates only within cluster effects, relying on only within cluster differences. In a random effects approach, cluster effects are estimated on the basis of both cluster-level and within-cluster data. Because of this, correlation may be absorbed into the group level effect. Given a model and data in which fixed effects estimation would be appropriate, a Hausman specification test (see Appendix B) may be used to test whether random effects estimation would be comparable. In general, if the test statistic is large, one should normally use fixed effects, although arguably in some cases random effects may still be preferable (see Fielding 2004). A potential alternative solution would clearly be to improve the specification of the model if possible, by including variables to reflect cluster-level variability. As a prior measure, the approach adopted in this study is to attempt to remove the correlation between an explanatory variable and a cluster-level random effect by de-meaning the problematic explanatory variable(s) and including it in the model along with the group mean. As Rabe-Hesketh and Skrondal (2008:115) note, this

measure addresses confounding because the mean-deviation variable acts an 'instrumental variable' in that it is correlated with the potentially endogenous term (the cluster mean) but not with the random effect (intercepts). The random intercept may be construed as the sum of the cluster-mean of the endogenous variable plus the cluster-level residual and thus is no longer uncorrelated with the endogenous regressor. The approach may be compared in its estimates to a two-stage least squares 'instrumental variables' model.

### 3.4.7 Modelling Techniques and Estimation Strategies

Two broad categories of model are required to estimate the equations used to represent the relationships addressed by the empirical research questions. Where the response variable is continuous and linearly related to explanatory variables, multivariate linear regression techniques are employed in both single and multi-level frameworks. Where the response variable is binary or categorical as in the case of educational outcomes, probit and/or logistic regression techniques are used to model probability density functions. Quantile regression is employed to explore variation in the effects of covariates across the distribution of the outcome variable. 'Fixed', 'between' and 'random' effects approaches are used to model data clustering in GLSS data and consideration is given to 'selection effects' with respect to employment. Details of the models employed are presented in Appendix B.

### 3.4.8 Modelling Approach and Procedure

For the purposes of this research data have been extracted mainly, although not exclusively, from three modules of the GLSS questionnaire: education, employment and household expenditure/income. The education module includes measures of the level of education or formal schooling of all household members aged five years or more, the amount spent on education and highest educational qualification achieved. The employment module gathers detailed information on employment and sources of household income for household members aged seven and above. The household expenditure and income module includes data on components of household income and consumption expenditure.

Figures reported in Ghanaian Cedis have been re-based to the 1999 purchasing power level of Accra using deflators from the GSS. Several derived variables have been

computed from the data, including a continuous variable for the number of years of education received which is based on information about the highest grade or level completed and the highest qualification attained. This is complicated somewhat by the 1987 education system reforms in Ghana which introduced changes to the length of lower and upper secondary school cycles. Table 3.3 below compares the systems before and after the reforms.

**Table 3.3: Pre and post reform qualifications in Ghana**

| Level | Pre-1987 Reform | Post-1987 Reform |
|---|---|---|
| Middle School | MSLC (up to 4 yrs) | BECE (3 yrs) |
| (Lower Secondary) | (Middle School Leavers' Certificate) | (Basic Education Certificate Examination) |
| Upper Secondary | O-Level (up to 5 yrs) | SSSC (3 yrs) |
| | A-Level | (Senior Secondary School Certificate) |

Although monetary figures have been re-based, the distribution of variables across independent cross-sections is likely to change over time so that although it is reasonable to assume that observations are independent across cross-sections it is not valid to assume that they are identically distributed. To reflect this, a dummy variable is included for each cross-section (time period) when data are pooled. Derived variables have also been computed to measure the proportion of young and older children and of adults aged sixty or more at household level. A simple binary indicator of migration has been computed to reflect whether an individual at the time of the survey was living in his or her region of birth.

#### 3.4.8.1 Modelling Household Poverty and Welfare

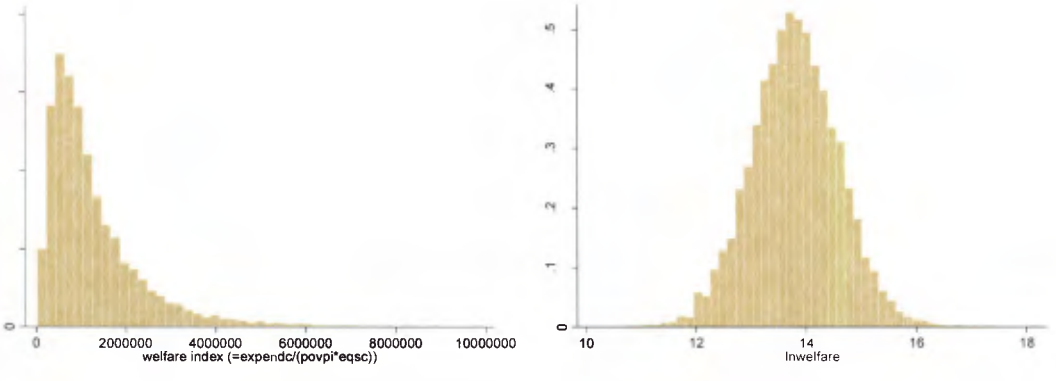
The approach adopted relies on regression of a 'consumption function' - an econometric model equating household consumption and its determinants. The procedure estimates the values for the partial effects of determinants on consumption, with special attention to educational variables. It requires the development of consumption and educational indicators, derived from items in the household survey questionnaires alongside a range of controls. The use of indicators of household assets allows consumption to be considered in part as a return to these assets. Additionally, returns to assets are affected

by contextual variables including urban/rural location and other features of the locality and environment for which indicators are constructed. Drawing upon, and in common with the approaches of Glewwe (1991) and Teal (2001), the inclusion of explanatory variables centres on predetermined rather than exogenous variables, with the consequence that interpretation is conditioned by the distribution of these variables.

As a first stage to examining the relationship between per capita household welfare (the measure used to define poverty outcomes in Ghana), welfare is modelled using OLS as a linear function of the educational attainment of household heads without additional controls. Both the household head's completed years of schooling and highest qualification or level of attainment are used in separate models with standard errors corrected for data clustering. This exercise estimates the correlations between welfare and education at household level, using the household head's level of education as a proxy for the general level of education in the household. While the correlations cannot be given a causal interpretation, they allow a consideration of both the level of overall association between welfare and education and of change over time since results are reported for a pooled cross section and for each individual survey round.

The outcome variable is the natural logarithm of 'welfare' as defined by the GSS (see section 3.4.3.2). A logarithmic transformation is used as welfare, like income has a distribution with a rather long upper 'tail' and the relationship between key predictors, especially education is consequently better modeled using linear regression when using the transformed variable. The histograms in Figure 3.8 below illustrate the distributions of the variables welfare and lnwelfare.

**Figure 3.8: Distribution of welfare and log-transformed welfare variable in GLSS**




Source: GLSS 3-5 data

Explanatory variables are included to account for variation in household welfare according to household assets and the broader context in which the household is located. Three groups of explanatory variables were extracted or computed from the GLSS data - human capital variables, physical capital variables and contextual variables. The two structural levels in the data are 'household' and 'cluster'. The education and age of the household head is used as a proxy for human capital levels in the household.

In order to explore the effects of explanatory variables on poverty outcomes more directly, an ordered probit model is estimated using the categorical variable for poverty status as the outcome. While this is a useful illustration of the determination of the probability of a household being poor, it does not make use of the full range of variability contained in the household welfare variable and consequently subsequent models employ the welfare variable as the outcome, with interpretation addressing poverty determination. Moreover, Appleton (1995: 2) found in his comparison of consumption and poverty functions that "the poor receive comparable rates of return on their assets to the non-poor" and hence consumption modelling may be considered informative with regard to the determinants of poverty.

Figure 3.9 illustrates the key contributors to the calculation of household poverty status. On the right–hand side of the figure, poverty status is shown as the outcome of the calculation of per-capita household welfare (consumption expenditure) levels, divided into three bands – extremely poor, poor and non-poor; based on calorie-requirements set to equivalent consumption expenditure values. These values are corrected to be equivalent in terms of purchasing-power in relation to these calorific requirements by being inflated/deflated to reflect local prices and points in time as described in section 3.4.3.2. This allows effects on welfare to be construed in equivalent terms between survey rounds and across locations. Accordingly, effects of region, for example, are not attributable to differences in prices. Household consumption expenditure (welfare) in monetary equivalent terms is a function of all sources of income (including in-kind incomes and auto-consumption) from five key groups of sources. These are employment, self-employment, own-agricultural outputs, remittances, rents and other sources, including transfer payments such as those from social security schemes and educational scholarships. In the cases of employment and self-employment, total

household income is the sum of individual household members' incomes from these sources.

Modelling proceeds in a systematic stepwise approach employing 'fixed', 'between' and 'random' effects then adding more complex variation including 'random intercepts', 'random slopes', 'contextual variables' and 'cross-level interaction' using multi-level modelling. While some of the household-level variables (for example employment status) might be expected to bias estimates of education effects in a single-level model by being correlated with both education and welfare, at cluster level they may be considered largely independent of individual household outcomes but rather an indicator of context (such as the availability of wage employment in the local labour market). The issue of potential endogeneity bias caused by correlation between random effects at cluster level and clustered values for explanatory variables at household level is examined and addressed as described in 3.4.6.1. Attention is given to the distribution of educational effects including in terms of the covariance between educational effects and cluster-level random intercepts, indicating the interaction between latent cluster effects and education effects on welfare. Quantile regression is also employed in order to examine differences in educational effects away from the mean of household welfare.

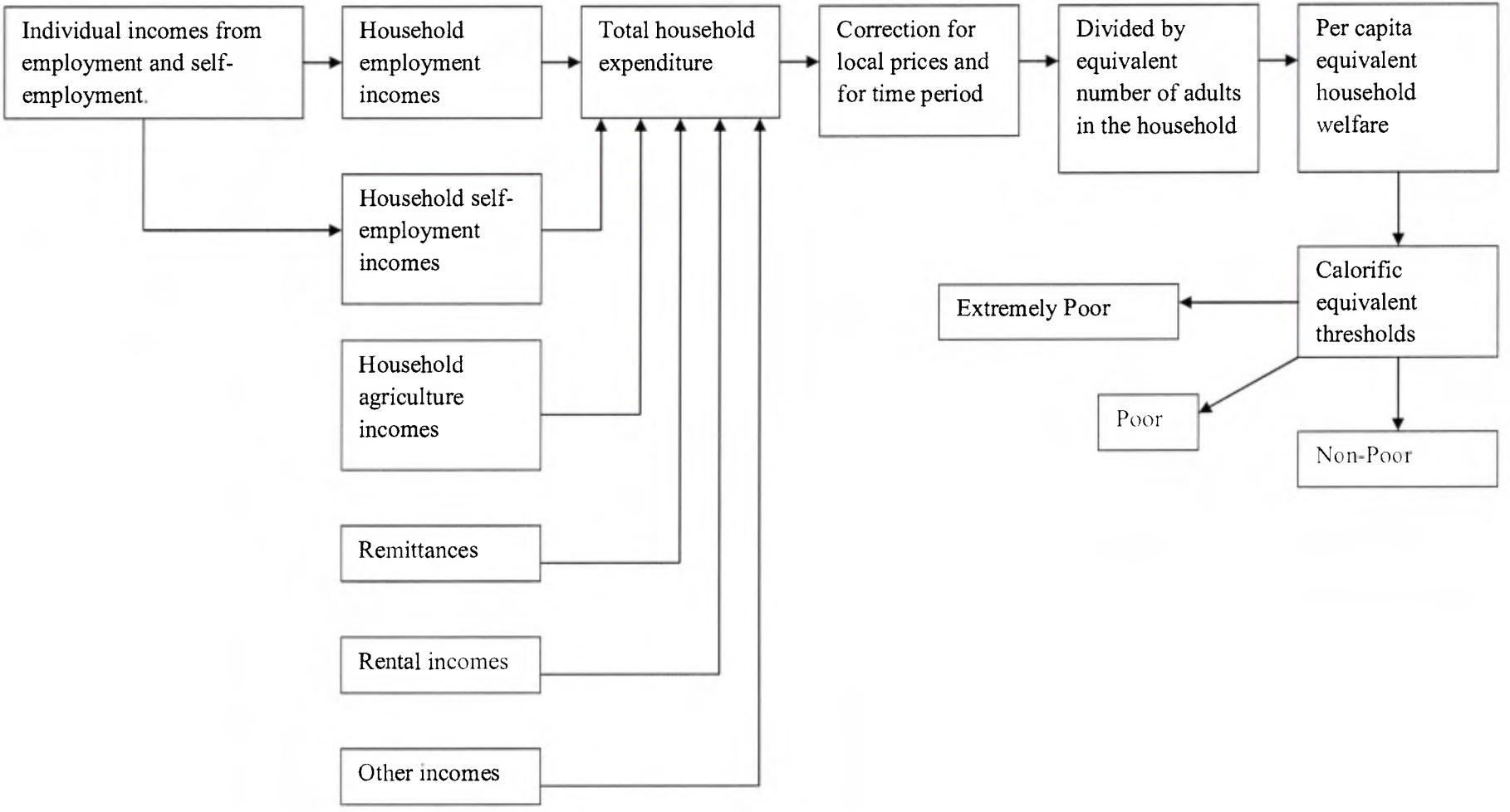
Since per capita household welfare is a function of incomes to the household, additional models are employed to examine the factors which are associated with selection into and the returns to particular income-earning activities, with particular attention to education.

### 3.4.8.2 Modelling Educational Outcomes

Since part of the focus of the study is on the system of determinants of the benefits of education, the benefits of educational investment must be considered in the light of what determines households' abilities to make these investments. In a situation of unconstrained access to education and to credit, households may be expected to invest insofar as the future benefits outweigh the (discounted) current costs in accordance with a household production function model (Becker 1965). This calculus of costs and benefits is nonetheless locally specific and dependent on factors including educational quality and the availability of economic opportunity. Moreover, households face different constraints based on their composition and exhibit a range of preferences for

education. Further, educational access in Ghana is also constrained by supply and households face credit constraints. The determination of access to education and of educational attainment needs therefore to be explored. For this purpose, a probit model is employed to estimate the determinants of educational access. An ordered multinomial model is employed to examine the determination of educational attainment of young adults alongside a series of binary logistic models, which explore the factors associated with educational progression between levels.

**Figure 3.9: The determination of household poverty status**



## 3.5 Methodology: Secondary Study

Levels of educational access and progression are considerably lower in Northern than in Southern Ghana, partly for fairly well understood economic reasons pertaining both to educational supply and demand. Historical and cultural factors also exert an important influence and the operation of mechanisms of educational exclusion is conditioned by local context. In order to explore the issues emerging from national level statistical analysis, the secondary study selects a single deprived district in Ghana - Savelugu-Nanton. The district was purposively selected as the Northern site for CREATE's Community and School Survey (ComSS) (see 3.5.2) because of deprivation in educational and economic terms. It is a district in which considerable challenges are experienced in relation to access to basic education (see Ampiah and Kwaah 2007 and Ampiah and Adu-Yeboah 2009). The secondary study focuses on research sub-question eight, employing both quantitative analysis of survey data and analysis of three sets of semi-structured interviews.

### 3.5.1 Qualitative Data and Analysis

The first stage of qualitative research was intended to explore issues of educational access in the Savelugu-Nanton district. Exploratory interviews were conducted by the author in March 2010. These interviews served as a preliminary for the identification and selection of local issues of educational access to be examined in depth both through quantitative and qualitative analysis. The interview schedule (see Appendix E2) addressed three thematic areas derived from the main study research question and sub-questions intended to examine factors associated with poverty, initial access to schooling, retention and progression. These were categorised under three headings - local labour markets and household income generation (relating to demand for education), culture and community perceptions (also relating largely to demand) and educational provision (relating to supply). Table 3.4 summarises the issues addressed.

**Table 3.4: Summary of issues addressed in interviews with education professionals**

| | |
|---|---|
| Local labour markets and household income generation | • availability and rewards to child labour (opportunity cost of schooling and enrolment decisions, gender-related enrolment decisions)<br>• natures of local and external labour markets, migration<br>• availability and rewards to adult labour, opportunities, incomes and returns to education<br>• livelihood challenges and poverty |
| Community culture and perceptions. | • cultural practices impacting on access to education, e.g. early marriage, migrant labour (*kayaye*), fosterage, polygamy<br>• perceptions of the importance of schooling, gender-roles, children's work and training |
| Educational assets and provision. | • availability of basic schooling and opportunities for progression<br>• school quality and relevance<br>• costs of schooling<br>• impact of policies and initiatives at local, district and national level e.g. school-feeding, incentives for girls, infrastructure rehabilitation, capitation grants |

Twelve exploratory interviews were conducted with education professionals, considered to have detailed knowledge of educational access issues in the district. The interviewees comprised four circuit supervisors (for the four circuits in the ComSS sample), six public primary head teachers, one private primary head teacher, five public JHS head teachers, the Deputy District Director of Education and Mahama Abukari, a district education officer and Dagbon tribal chief. Interviews followed a semi-structured approach and were conducted in English at the District Education Office in Savelugu town and at the schools where the head teacher interviews were concerned. Interview responses were recorded digitally.

Education professionals identified an extensive range of factors relating to educational access which are considered in relation to the literature in Chapter 7. Every interviewee drew attention to the importance of child fosterage and most to the practice of migrant labour common among school drop-outs known as *kayaye*. These emergent issues were selected for detailed exploration through both quantitative analysis where it was possible and through two sets of focused interviews – with foster-carers and migrant youth *kayaye* workers. The emergent research questions and research strategy, which also employed semi-structured interviews, are outlined in Chapter 8.

### 3.5.1.1 Semi-Structured Interview Approach

Semi-structured interviews were selected as the method of gathering qualitative data because of their relative simplicity and efficiency as a tool for gathering data on phenomena which are otherwise difficult to observe. The complexity of education-poverty relationships precludes direct observation so that at local level, informed opinion may be considered an appropriate source of evidence. The initial set of interviews was exploratory, so that interview schedules were designed to be open-ended, flexible and wide-ranging. It was not intended that responses should be comparable but that they would reveal as many insights as possible into dimensions of the education-poverty relationships in Savelugu-Nanton. According to Oppenheim (1992) such interviews should be designed to be heuristic and to focus on uniqueness at the expense of standardisation. The intention was to illuminate the issues under investigation with attention to particularity, interpretation and local explanation, without necessarily being able to capture the nuance and subjectivity that a more involved ethnographic approach might reveal. Cohen and Mannion (2010:351) suggest that semi-structured interviews can serve "to follow up unexpected results, for example, or to validate methods, or to go deeper into the motivations" and to "test hypotheses or to suggest new ones; or as an exploratory device to help identify variables or relationships". In the case of the interviews in this study, exploratory interviews were intended primarily to explore relationships, while focused interviews followed up on earlier results, serving to deepen the understanding gained from previous analyses.

The semi-structured interview approach allows space for respondents to express and develop views and to offer interpretation as well as to develop the interview focus in line with their concerns around the topic. The approach also presents the interviewer with opportunities to probe interesting issues arising, and is thus a practical way to pursue unanticipated aspects of the research questions. Indeed, in the cases of both fosterage and *kayaye*, these issues were known to present barriers to educational access in advance, but the strong emphasis given to them by education professionals was not expected by the researcher. Again the flexibility of the semi-structured approach to exploratory interviews was useful to limit the effects of pre-judgement of the issues. The researcher adopted an approach of deliberate openness and of acceptance of ambiguity and contradiction as far as possible, with the intention of capturing diversity among perspectives.

The most important disadvantage of the approach perhaps is its proneness to subjectivity and bias on the part of the interviewer and/or interviewee. Education professionals were selected as the sample of respondents for exploratory interviews since they are clearly experienced practitioners and are well acquainted with the issues they themselves face in schools as well as with many of the issues households experience in relation to gaining access to education for their children. The interviewees were selected from each of the schools and circuits included in the CREATE ComSS survey so in this way were linked to the school data sample and were drawn from a range of urban and rural settings. Nonetheless, the views of the selected sample may not necessarily be expected to be representative. In relation to bias, education professionals may be expected to view certain issues differently from other stakeholders in basic education, especially parents, particularly because the gap in educational and other forms of experience in the setting of northern Ghana is very large between relatively well qualified public servants and parents who are mostly food farmers.

This potential bias was addressed in part, however, through the two subsequent sets of interviews which sampled caregivers in rural areas and *kayaye* workers who were found to be particularly disadvantaged in terms of their home backgrounds and educations. Foster-carers were selected from households sampled in the CommSS in rural areas where fosterage is more prevalent, using a random procedure (see Chapter 8). The sample of *kayaye* workers was a purposive quota sample in that workers from Savelugu-Nanton and the neighbouring district were selected with the help of two education circuit supervisors until a fixed number of twelve was reached within the identified age-group (see Chapter 8). Differences in perception, especially in relation to fosterage and the treatment of foster children, which may be considered a sensitive issue, were notable and linked to respondent-groups.

More generally, the semi-structured interview approach suffers potentially from low reliability in the sense that interviews are difficult to repeat or to validate and samples are necessarily small. Equally, the personal nature of the interviews makes them difficult to generalise. These were not principal aims however, especially for the exploratory interviews. The focused interviews had more specific aims related to the exploration of issues of fosterage and *kayaye* and the intention was in part to be able to enumerate and categorise responses to give a sense of where consensus and differences

of perspective are to be found in relation to these issues. Thus, their validity consists rather more in their ability to illuminate findings from other sources of data so that they are in some measure 'symbolically representative' and 'theoretically generalisable' (see Greene et al 1989).

The exploratory interview schedules were piloted with education students at the University of Cape Coast who had lived in the Northern region. The students suggested revisions and additions particularly relating to local understanding of English terms by education professionals, which were incorporated. The focused interview schedules were piloted with two circuit supervisors in Savelugu-Nanton who are Dagomba and long time residents of the district. They also acted as translators.

#### 3.5.1.2 Data Coding and Analysis

Recordings were transcribed verbatim and analysis employed data from the transcribed interview scripts. A first phase of analysis served to summarise the data, to label, identify and highlight text relating to pre-identified themes (thematic coding), thereby identifying clustering of responses some of which formed recognisable categories. While coding has the potential to atomise data thereby losing some of the holistic character of responses, it is important as a method both to reduce information overload and to link responses meaningfully to the research aims (see Miles and Huberman 1994). A second stage highlighted emerging patterns and themes. A third analytic phase consisted of thematic analysis guided by the research questions and by the results of secondary analysis and, in the case of the focused interviews, the results of exploratory interview analysis. This phase served to fit categories together where appropriate and to delineate meaning and facilitate interpretation. Pre-identified and emergent themes provided the framework for analysis of the exploratory interviews while for the focused interviews, the literature on fosterage was employed to generate categories of analysis which were then supplemented by emerging themes. Where appropriate, frequency-counts were conducted relating to particular categories of response but for the most part analysis focused on connecting interview data with the literature and secondary findings by factoring, differentiating, elaborating and unpacking data through 'constant comparison' (see Saldana 2009). The analysis of data from the exploratory interviews focused on identifying patterns and issues for further investigation, particularly concerning local level 'intervening factors' in the education-

poverty relationship, while the analysis of data from the focused interviews sought to identify linkages and draw inferences from the data to conceptualise, synthesise and build a narrative, albeit loosely, around the roles played by fosterage and *kayaye* in the education-poverty relationship at the local level.

### 3.5.2 Quantitative Data and Analysis

Quantitative analysis in the secondary study employs data from the GLSS for the Northern region of Ghana and from CREATE's ComSS survey conducted in the Savelugu-Nanton district between 2007 and 2010, focused especially on the relationships between fosterage and educational access. These data offer a meso-level account of this important issue as identified in the exploratory interviews, which is linked to the macro level findings of the primary study.

For the CREATE ComSS study, six communities were selected purposively from four educational circuits in Savelugu-Nanton, two rural and two peri-urban. The selected circuits, communities and schools are summarised in Table 3.5 below. The CommSS tracked 1630 pupils in Savelugu-Nanton and collected data from 722 households identified as the homes of tracked children. These households comprised 7697 individuals, 2872 of whom were in the age-group 6-17; the ages when children most commonly attend school. The data contains information on children's attendance, progress and achievement at school and on relevant characteristics of their households. The survey was purposive in that the selection of schools is intended to capture peri-urban and remoter rural examples, where there may be particular access issues. The schools were identified in consultation with local Circuit Supervisors from the District Education Office. Pupils were then identified in four grades – primary 1, 4 and 5 and JHS 1 with the intention of focusing on issues of initial entry and transition. All pupils in the selected grades were included and none refused to participate. However, it was not possible to visit all of the children's households for logistical reasons, including costs, and therefore household information is available only for a sub-sample of 803 of the 1630 tracked pupils (49.3%). The group of tracked pupils is not representative of children in the district, firstly because the sample is purposively selected and secondly because children who have never attended school are excluded. While the purposive selection may mean that the schools are those with particular access issues, it is also the case that the remotest schools are not included for reasons of practical necessity.

Moreover, owing to higher school-enrolment among boys, the sample is skewed to include a higher proportion of boys. Nonetheless, the data illustrate the issues of interest in relation to children in school and are the best currently available.

**Table 3.5: CREATE ComSS study sample**[2]

| Circuit | Community | Survey Primary School | Survey Lower-Secondary School |
|---|---|---|---|
| 1 (peri-urban) | A | English-Arabic A | English-Arabic B |
| 2 (peri-urban) | B | Low-cost private | - |
| | C | English-Arabic C | English-Arabic D |
| | D | Roman Catholic A | Roman Catholic B |
| 3 (rural) | E | District Assembly A | District Assembly B |
| | F | District Assembly C | District AssemblyD |
| 4 (rural) | G | District Assembly E | District Assembly F |

Source: Adapted from Ampiah and Kwaah(2007)

### 3.5.3 Ethical Issues

The ethical implications of this study were considered in light of the literature on ethics in relation to undertaking research with human participants and the research is informed by appropriate ethical frameworks (BERA, 2004; ESRC, 2006). The research is linked to the DFID-funded CREATE project and was also guided by its research framework (see www.create-rpc.org). Participants were informed specifically of the research objectives of the exercises. They were given an opportunity to ask questions and informed consent was sought prior to participation. Participation in the study was entirely voluntary and participants were free to withdraw from the study at any point or to choose not to answer particular questions. Participant information sheets were provided giving details of the work to be undertaken and explaining issues of consent and confidentiality (see Appendix E1). No significant risks to participants were anticipated as a result of participation. Financial or other incentives were not provided and expenses were not incurred by participants. Anonymity and confidentiality were ensured through the removal of participants' names for the purpose of data storage and subsequent analysis with one exception in the case of Mahama Abukari whose work is cited in the thesis and who gave permission for his comments to be attributed to him.

[2] Community and school names are anonymised

It is intended that the DEO's professional work may benefit from the insights gained in the study. A copy of preliminary findings has been provided to the office for information and comment. A copy of the final analysis will also be provided.

# CHAPTER FOUR:

# MACROECONOMIC AND EDUCATIONAL CONTEXT

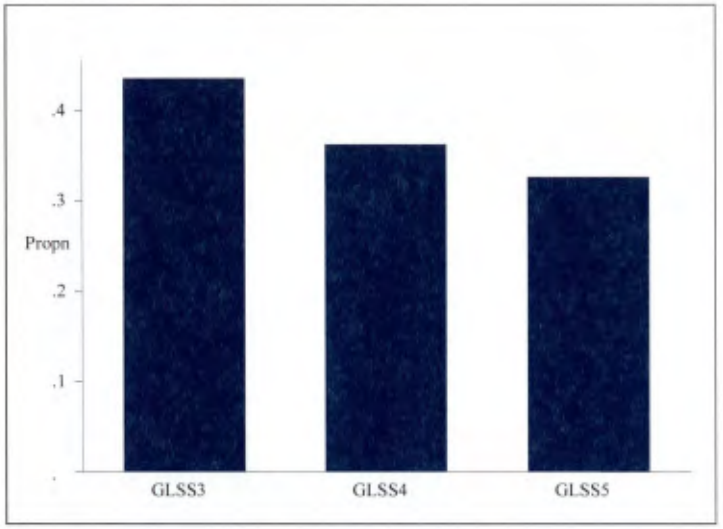
This chapter presents descriptive analyses of the context of educational and economic development in Ghana in the period 1991-2006. The patterns discussed are indicative and are not formally statistically tested. The chapter provides empirical background for the modelling work that follows in Chapter 5 and addresses research sub-questions one and two, focused on recent patterns and trends in educational access, welfare and poverty in Ghana.

## 4.1 Education in Ghana 1991-2006: The Adult Population

The period since 1991 has been marked by significant improvements in educational access and attainment overall in Ghana. The proportion of adults per household with no formal education declined markedly over the period from 1991-2006 as shown in Figure 4.1, reflecting educational access improvements stretching back much further than this period alone. The trend shows that greater gains were achieved between 1991 and 1999 than between 1999 and 2006. A pattern of improving access is also found in relation to higher levels of education. Table 4.1 gives more detail, showing the highest level of educational attainment of adults in the 18-35 age-group for each round of the GLSS in the period. Figure 4.2 shows an increasing trend in relation to adults with senior secondary or higher level qualifications in the 18-35 age group. The proportion of adults who had never attended school fell, but only between the two earlier survey rounds, from more than a quarter to just over a fifth. Around half of adults had primary education or less as their highest level of educational attainment and although this fraction reduced between GLSS 3 and 4, there is little evidence of improvement thereafter. The pattern is similar for lower secondary schooling and it is only at the level of upper secondary and above that notable increases in attainment are found in GLSS 5 when compared to GLSS 4. In the case of tertiary education in particular, the proportion of adults educated to this level more than doubled between GLSS 4 and 5.

Increases at higher levels of education were possible due to notable increases in access at lower levels in the period prior to 1991. Overall, improvements in adult education levels were achieved mostly in the early part of the period and are consistent with Teal's finding that the average working adult's education increased by 27 per cent using GLSS 3 and 4 data (Teal 2001:11). Table 4.2 shows the mean number of years of schooling for household heads only, which increased by 23 per cent over the 15 year period. It also provides detail on the highest educational qualification of household heads in Ghana in each of the GLSS survey rounds. Increases in the proportions of heads educated to particular levels are apparent between 1991 and 1999, but these remained fairly stable thereafter, except in the case of higher education degrees.

**Figure 4.1: Adult household members with no formal education in Ghana 1991-2006**



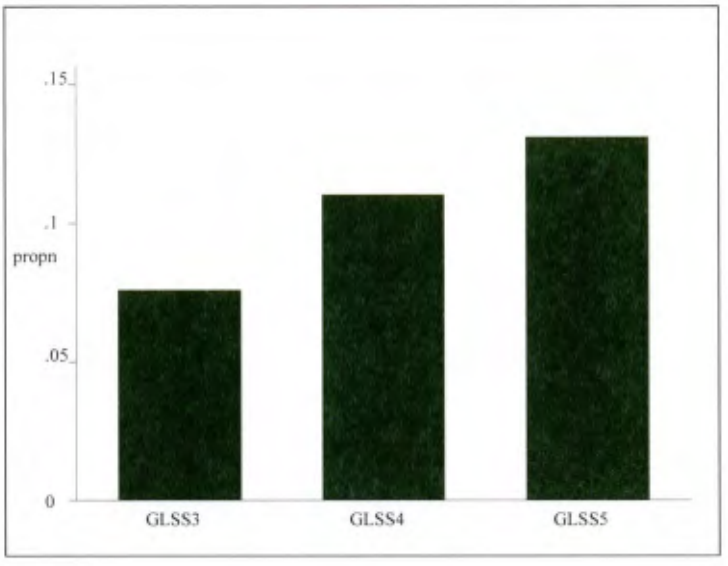

Source: Computed from GLSS 3-5

**Table 4.1: Adults' (aged 18-35) highest levels of education in Ghana 1991-2006**

| Education level | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|
| Never attended | 27.8 | 21.2 | 22.9 |
| Less than completed primary | 9.0 | 9.7 | 10.4 |
| Primary | 14.4 | 14.6 | 15.3 |
| Lower secondary | 39.3 | 39.6 | 34.2 |
| Upper secondary /vocational | 7.7 | 11.5 | 13.3 |
| Technical/professional | 1.1 | 1.9 | 1.8 |
| Tertiary | 0.5 | 0.7 | 2.0 |
| Other | 0.2 | 0.8 | 0.1 |
| Total | 100.0 | 100.0 | 100.0 |

Source: Computed from GLSS 3-5

**Figure 4.2: Adults aged 18-35 with senior secondary or higher qualifications in Ghana 1991-2006**




Source: Computed from GLSS 3-5

**Table 4.2: Household head's highest levels of education in Ghana 1991-2006**

| Qualification | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|
| None | 41.41 | 34.14 | 34.72 |
| Less than primary | 10.10 | 9.53 | 9.99 |
| Primary | 10.36 | 10.80 | 11.01 |
| Middle | 28.18 | 31.70 | 29.58 |
| Vocational / commerce | 1.32 | 1.34 | 1.52 |
| O level | 3.89 | 4.14 | 2.41 |
| Senior Secondary | 0.00 | 0.67 | 2.74 |
| A level | 0.86 | 1.27 | 0.77 |
| Teacher training | 1.76 | 2.30 | 1.41 |
| Tech/prof cert | 0.59 | 1.84 | 2.07 |
| Tech/prof dip | 0.55 | 1.05 | 1.08 |
| Bachelor | 0.51 | 0.45 | 1.22 |
| Master | 0.15 | 0.08 | 0.35 |
| Doctor | 0.04 | 0.00 | 0.07 |
| Years of schooling | 5.39 | 6.26 | 6.62 |

Source: Computed from GLSS 3-5

### 4.2 Education in Ghana 1991-2006: Participation in Schooling

Notable differences emerge between schooling participation data from different sources in Ghana, partly because of the wording of questions in survey instruments and because of the definitions of schooling variables. For example, reported gross primary enrolment rates include over-age pupils, while net enrolment rates and attendance rated from household surveys typically report rates in particular age groups appropriate for

timely enrolment. Table 4.3 reports the available summary data for national-level participation in basic schooling since 1997 from various sources (see footnotes). In general, figures from administrative data are found to be higher than attendance rates based on surveys, in part because they may include enrolled pupils who are enrolled but not attending, but this pattern is not consistent in the Ghanaian case and the pattern to some extent appears to be reversed (see UNESCO 2005; Akyeampong 2007). Administrative data do not usually include private (especially unrecognized private) and Koranic schools, however, which are typically covered in household surveys (and are covered in GLSS) and are relatively common in Ghana. As a result of these discrepancies, schooling participation data in Ghana require careful interpretation.

**Table 4.3: Participation in basic education in Ghana 1997-2008 (%)**

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UIS/MOE Primary GER[3] | ... | ... | 81 | 85 | 81 | 83 | 80 | 84 | 95 | 95 | 101 | 107 |
| UIS/MOE Primary NER[4] | ... | ... | 61 | 64 | 59 | 61 | 64 | 59 | 66 | 66 | 72 | 78 |
| GLSS Attendance ratio | ... | ... | 84[5] | ... | ... | ... | ... | ... | ... | 86[6] | ... | ... |
| CWIQ Attendance ratio | 67[7] | ... | ... | ... | ... | ... | 70[8] | ... | ... | ... | ... | ... |
| DHS Attendance ratio | ... | 75[9] | ... | ... | ... | ... | 60[10] | ... | ... | ... | ... | 74[11] |
| MICS Attendance ratio | ... | | ... | ... | ... | ... | ... | ... | ... | 75[12] | ... | ... |

Sources: MICS, UIS, GLSS, DHS (see footnotes)

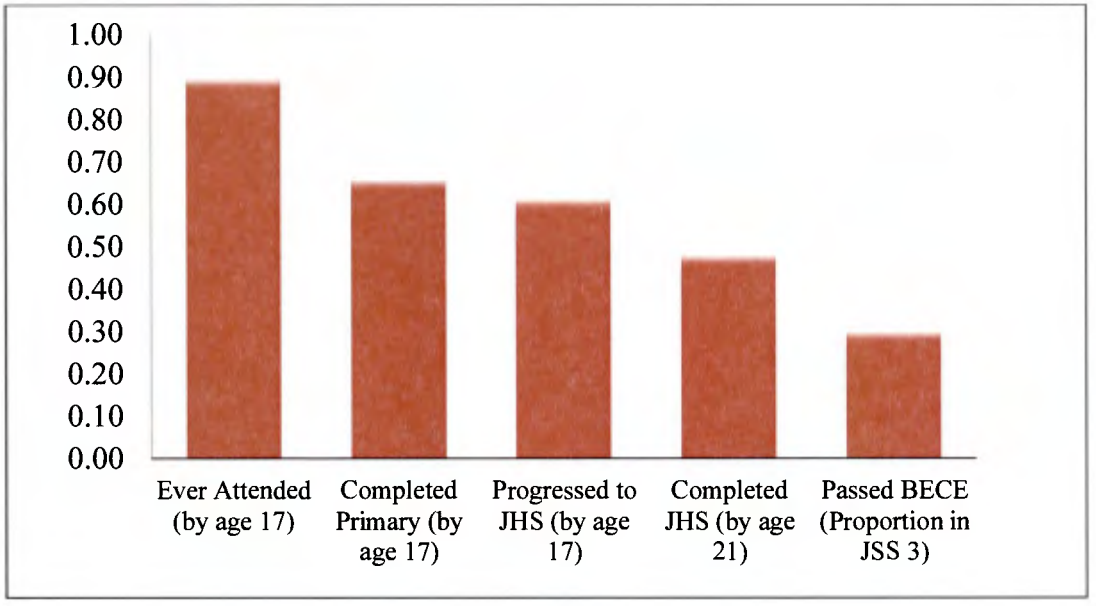
The figures suggest that a relatively small proportion of children in Ghana never enrol in any form of education. However, a much larger fraction do not reach the end of

[3] Primary GER. UIS website - http://stats.uis.unesco/unesco/TableView/tableView.aspx Table 5
[4] Primary NER. UIS website - http://stats.uis.unesco/unesco/TableView/tableView.aspx Table 5
[5] Primary Net Attendance Ratio (age 6-11) GSS(2000a):11
[6] Primary Net Attendance Ratio (age 6-11) GSS(2008):10
[7] Primary Net Attendance Ratio (age 6-11) World Bank website - http://siteresources.worldbank.org/INTSTATINAFR/Resources/ghcoreinds.pdf see Page (i)
[8] Primary Net Attendance Ratio (age 6-11) Ghana National Development Planning Commission website - http://www.ndpc.gov.gh/GPRS/NationalRegional.pdf
[9] Primary Net Attendance Ratio (age 6-11) GSS(1999b):13
[10] Primary Net Attendance Ratio (age 6-11) GSS(2004):18
[11] Primary Net Attendance Ratio (age 6-11) GSS(2009):19
[12] Primary Net Attendance Ratio (age 6-11) GSS(2007b):81

primary schooling. A fairly large proportion never enter secondary education and among those who do, many do not complete it. Figure 4.3 illustrates the cross-sectional pattern in 2005/6 (so that figures are for different cohorts and are indicative only) and shows that while around 90 percent enroll initially, only two-thirds complete primary school with a similar proportion entering JHS but only around half completing it and one third passing the end of basic school examination. Annual data from the UNESCO Institute for Statistics (UIS) gathered from the Ministry of Education illustrate national trends in enrolment in detail for the latter part of the period from 1991, i.e. from 1999 and are summarized in Figure 4.4. Total enrolment in basic education in Ghana has increased steadily since 1999, but more rapidly in primary education since 2005 (when the capitation grant was introduced). Figure 4.5 shows that enrolment ratios in primary education remained constant between 1999 and 2005, but increased markedly thereafter.

The substantial divergence between net and gross primary enrolment in Ghana reflects the relatively large number of 'over-age' children enrolled. This is illustrated in Figure 4.6 using data from GLSS 5. The last grade of primary school in Ghana would be reached by a pupil starting at the nominal starting age of 6 by age 12, barring grade repetition, but it is apparent that more than half of children in this grade are aged 13 or more. At the national level, gender differences in enrolment ratios in primary education in Ghana decreased over the period and there was near parity by 2008. The larger gender gap in gross enrolment rates when compared to net enrolment in primary education indicates a slightly greater prevalence among boys of enrolment outside the system defined age-range for primary schooling (i.e. over-age boys). Table 4.4 reports national statistics from UIS which show higher and increasing over-age enrolment for boys, reaching 30 per cent by 2008. In lower secondary education, enrolment ratios remained static from 1999 to 2003 but increased markedly from then onwards as illustrated in Figure 4.7. Upper secondary enrolment ratios began to increase from 2002. Gender differences are more marked in secondary than in primary education and differentials in secondary education show only very limited narrowing over the period.

**Figure 4.3: Proportions of pupils reaching stages of progress in basic education**



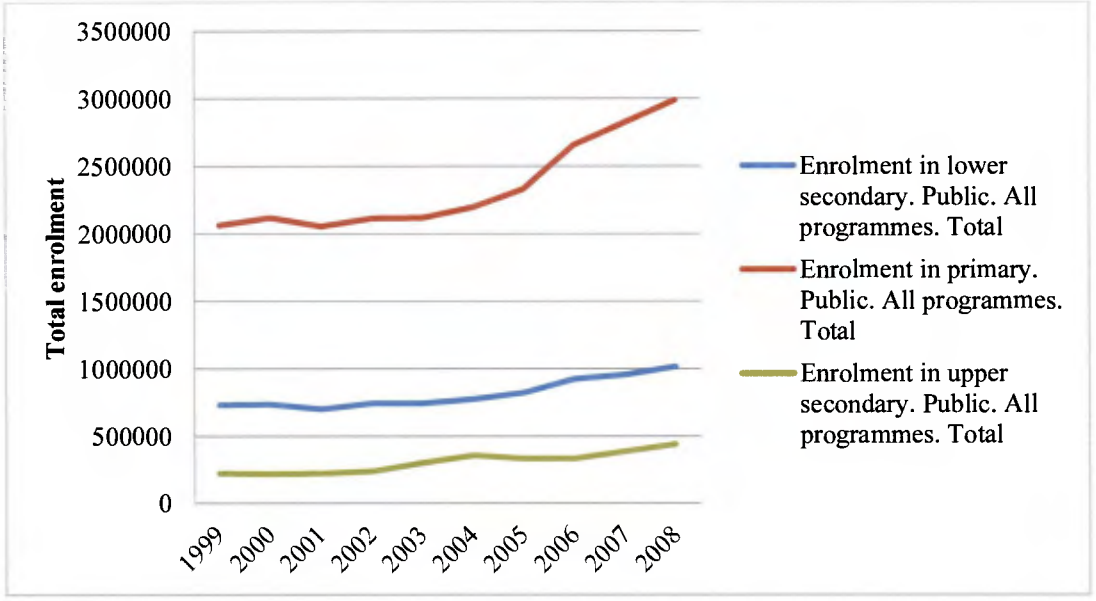

Sources: EMIS (2006) and GLSS 5

**Table 4.4: Educational participation indicators: Ghana 1999-2008**

| Year | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|
| Over-age enrolment ratio. Female | 13.9 | 14.9 | 15.9 | 16.9 | 12.2 | 18.2 | 19.3 | 25.8 | 25.0 | 28.4 |
| Over-age enrolment ratio. Male | 18.0 | 19.0 | 19.7 | 21.0 | 14.0 | 23.5 | 22.2 | 28.0 | 24.3 | 30.5 |
| Over-age enrolment ratio. Total | 16.0 | 17.0 | 17.8 | 19.0 | 13.1 | 20.9 | 20.8 | 26.9 | 24.6 | 29.4 |
| School life expectancy (years). Primary to secondary. Female | 6.4 | 6.7 | 6.5 | 6.7 | 6.7 | 7.0 | 7.6 | 8.1 | 8.7 | 9.3 |
| School life expectancy (years). Primary to secondary. Male | 7.4 | 7.6 | 7.2 | 7.5 | 7.2 | 7.8 | 8.2 | 8.7 | 9.2 | 9.8 |
| School life expectancy (years). Primary to secondary. Total | 6.9 | 7.2 | 6.9 | 7.1 | 7.0 | 7.4 | 7.9 | 8.4 | 8.9 | 9.6 |
| Survival rate to last grade of primary. Female | ... | 58.0 | ... | 65.3 | ... | ... | ... | ... | ... | ... |
| Survival rate to last grade of primary. Male | ... | 60.7 | ... | 55.3 | ... | ... | ... | ... | ... | ... |
| Survival rate to last grade of primary. Total | ... | 59.4 | ... | 60.0 | ... | ... | ... | ... | 83.4 | ... |
| Transition from primary to lower secondary (%) Female | 93.3 | 82.8 | 90.9 | 86.7 | ... | ... | ... | ... | 95.8 | ... |
| Transition from primary to lower secondary (%) Male | 92.1 | 81.4 | 89.2 | 86.9 | ... | ... | ... | ... | 90.0 | ... |
| Transition from primary to lower secondary (%) Total | 92.6 | 82.1 | 90.0 | 86.8 | ... | ... | ... | ... | 92.7 | ... |

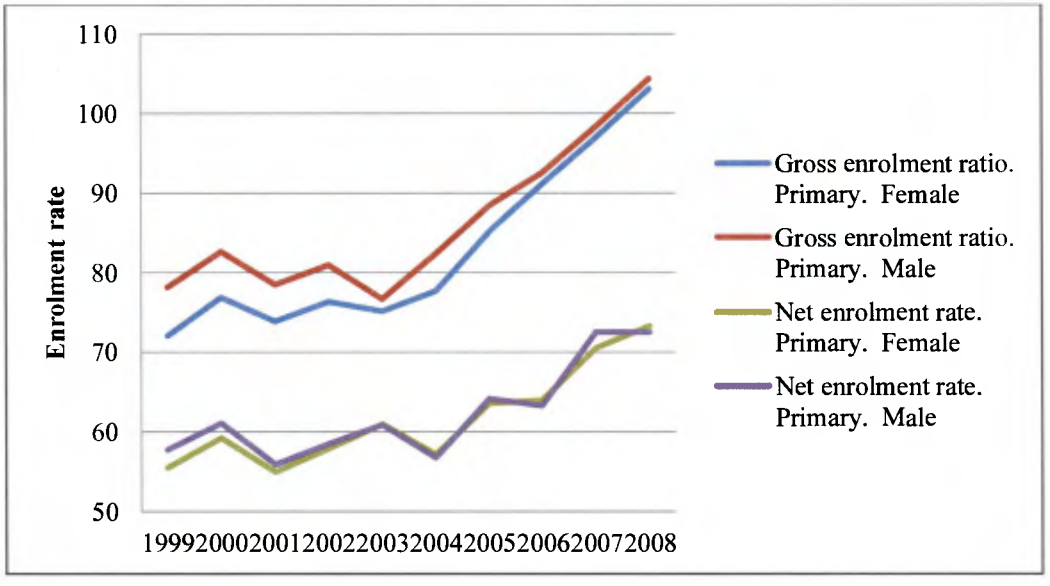
Source: UNESCO Institute for Statistics (national data)

**Figure 4.4: Enrolment in basic education: Ghana 1999-2008**



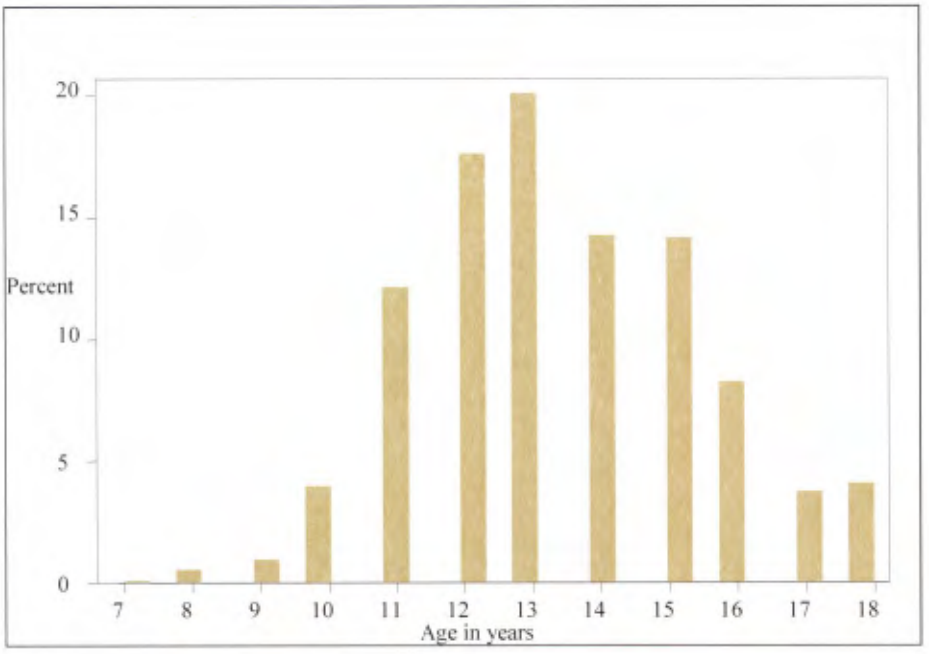

Source: UNESCO Institute for Statistics (national data)

**Figure 4.5: Enrolment ratios in primary education: Ghana 1999-2008**



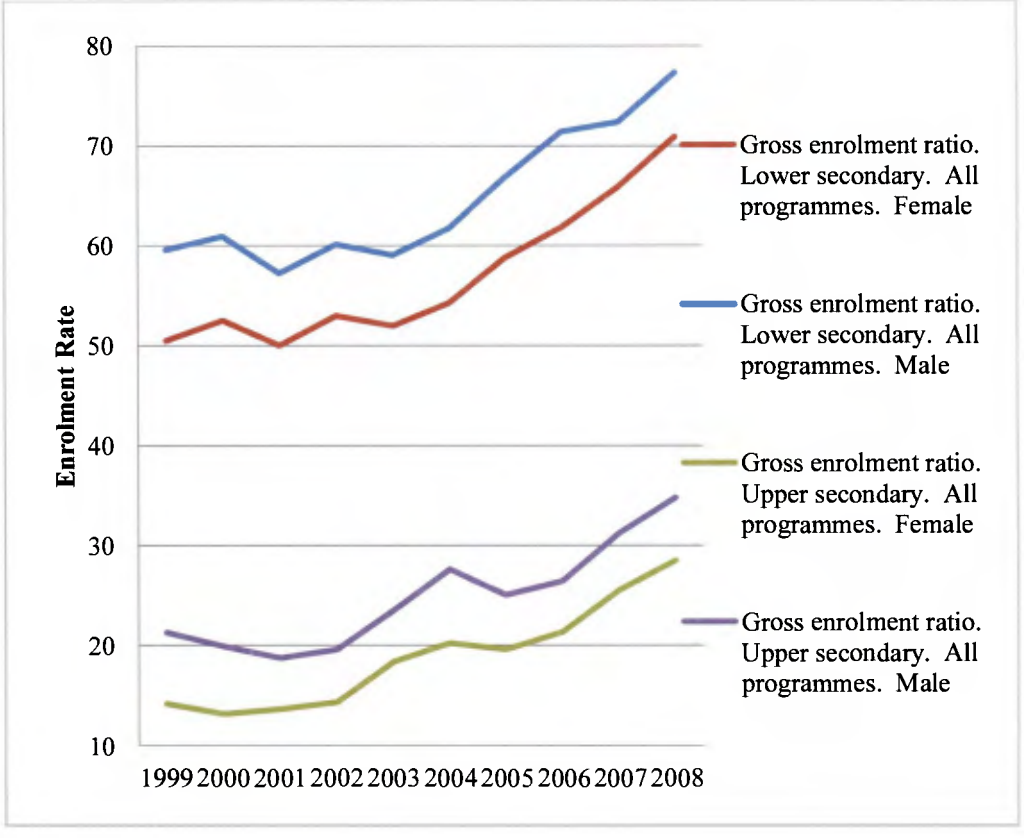

Source: UNESCO Institute for Statistics (national data)

**Figure 4.6: Enrolment in primary grade 6 by age: Ghana 2005/6 (GLSS 5)**




Source: Computed from GLSS 5

**Figure 4.7: Enrolment ratios in secondary education: Ghana 1999-2008**

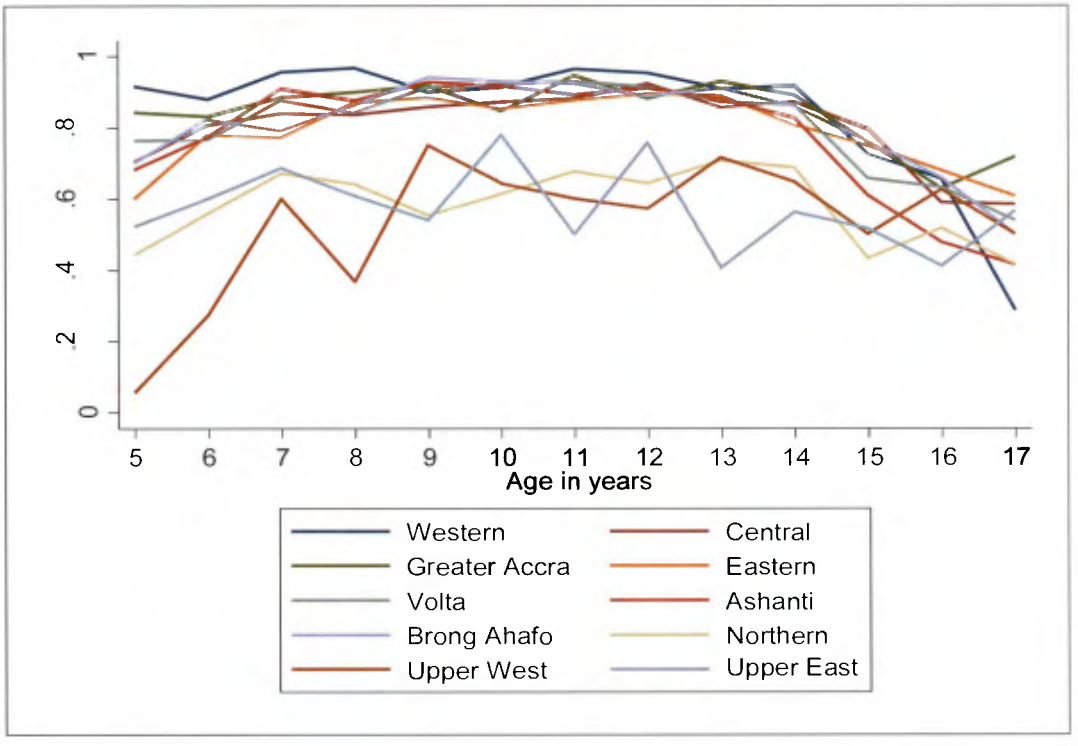



Source: UNESCO Institute for Statistics (national data)

The figures that follow illustrate some of the demographic characteristics with which schooling participation was associated in Ghana in 2005/6. Figure 4.8 illustrates school attendance rates by age and region, Figure 4.9 by age and religion, Figure 4.10 by age and gender, Figure 4.11 by urban/rural residence and Figure 4.12 by age and household poverty status. All of these figures employ data from GLSS 5. The survey question asks whether a child had attended school at any time during the twelve months prior to the survey visit. The same question is used in the DHS surveys in Ghana. Accordingly, a child has attended only rarely will be included. Levels of attendance may thus be expected to be higher than attendance-rates measured at school-level, which reflect average pupil attendance. Despite impressive figures at the national level, it is apparent that the distribution of disadvantage in schooling in Ghana reflects key cleavages in society, economy and culture. Figure 4.8 shows a similar shaped relationship between age and attendance in all regions, but at a lower absolute level for the three northern regions. The clustering of patterns into two groups – southern and northern is fairly distinct. In all groups, attendance falls dramatically at around age 15 when some pupils have reached the end of the basic cycle, but owing to over-age enrolment, many have not reached completion.

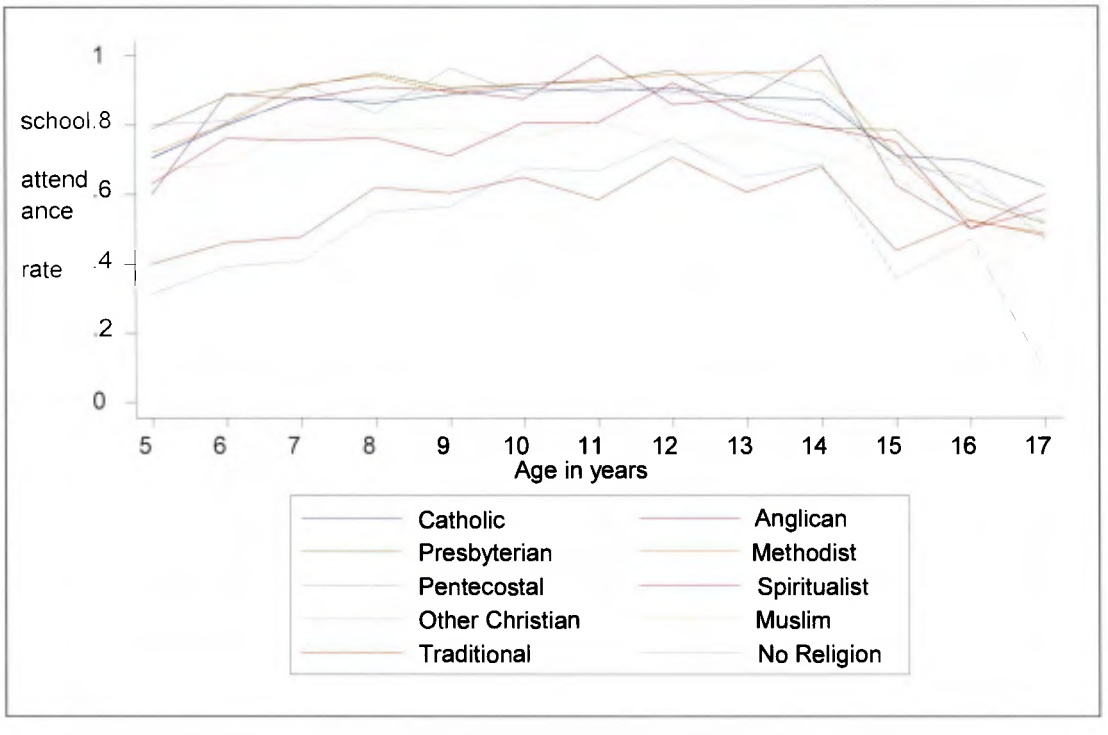
Figure 4.9 shows that children in households whose heads practiced Christian religions had higher attendance, a finding which is somewhat consistent with the regional picture, since Christian religions are more often practiced in the South. Figure 4.10 shows the gender gap in attendance rates which is moderate by comparison with other low income countries but widens for older children, consistent with the larger gap in secondary than in primary education shown in Figures 4.5/6. A sizeable gap in attendance between urban and rural dwellers is shown in Figure 4.11, although again a very similar pattern by age is apparent. Figure 4.12 shows that although the differences in attendance rates between the non-poor and the poor are not large for much of the age range, the extremely poor lag behind the other two groups substantially, possibly indicating that the direct, indirect and opportunity costs of schooling may be prohibitive only at the very lowest levels of household welfare and/or that extreme poverty is more closely associated with areas limited in school supply. Extreme poverty is also concentrated in Northern regions and rural areas.

**Figure 4.8: School attendance rates by age and region (GLSS 5)**



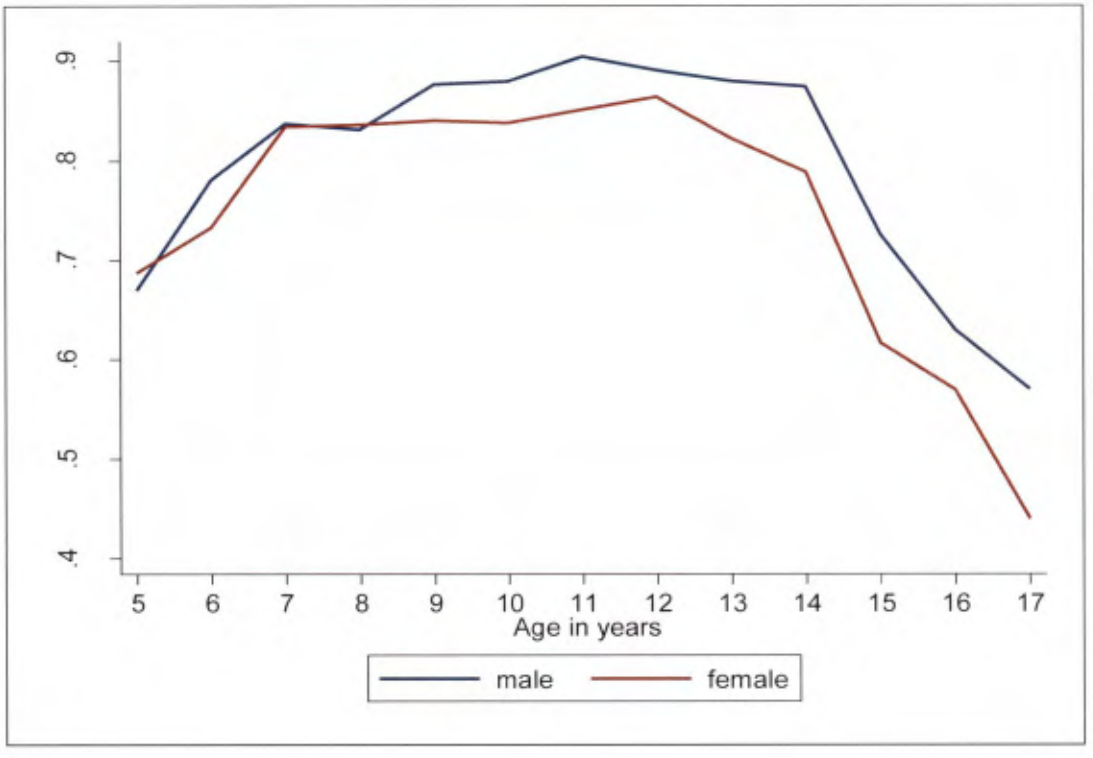

Source: Computed from GLSS 5

**Figure 4.9: School attendance rates by age and household religion (GLSS 5)**



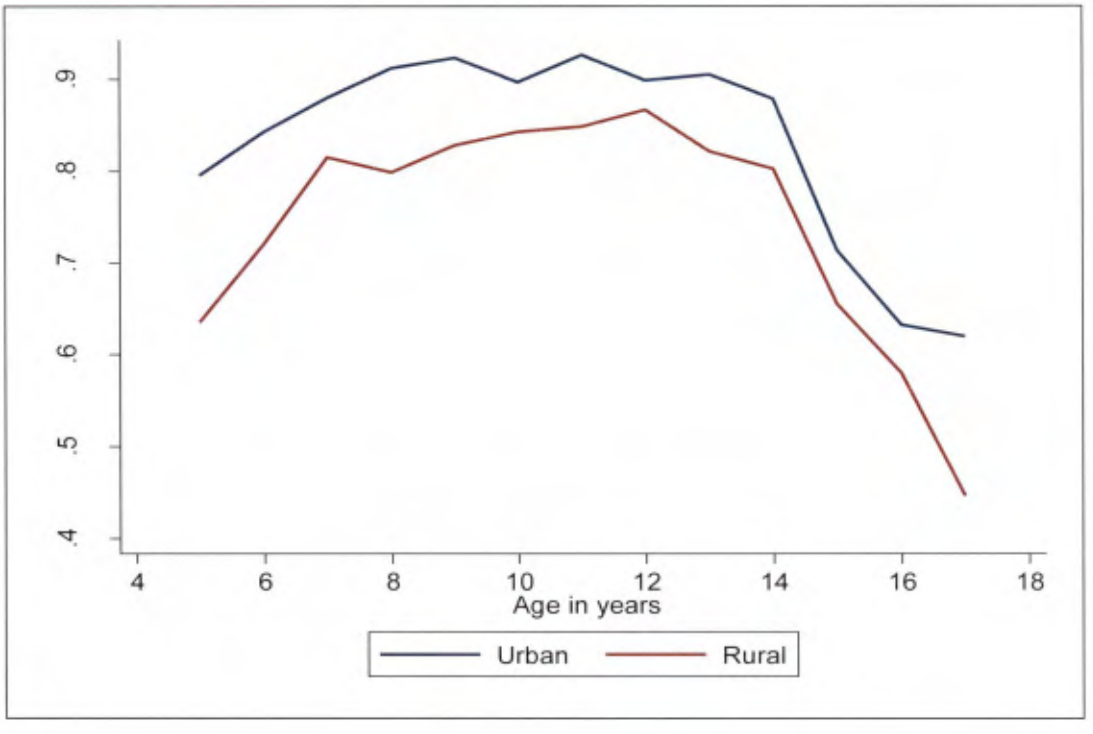

Source: Computed from GLSS 5

**Figure 4.10: School attendance rates by age and gender (GLSS 5)**



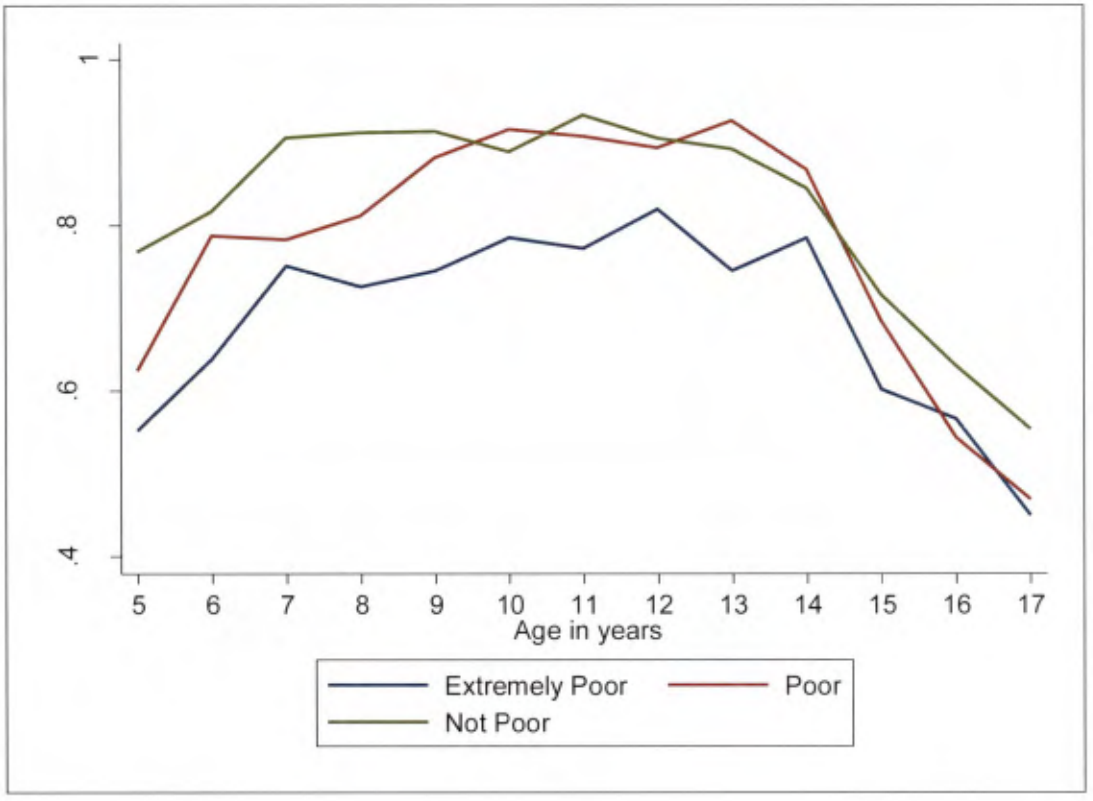

Source: Computed from GLSS 5

**Figure 4.11: School attendance rates by age and urban/rural residence (GLSS 5)**




Source: Computed from GLSS 5

**Figure 4.12: School attendance rates by household poverty status (GLSS 5)**




Source: Computed from GLSS

Table 4.5 shows the shares of total participation in public schooling by household expenditure quintile, calculated by Coulombe and McKay (2007) for GLSS 3 and 5. It may be used to illustrate the distribution of benefits of public expenditure on schooling. It shows that households in the richest two quintiles shared less in primary school participation, primarily because of their typically lower numbers of children. By secondary level, however, the poorest two quintiles shared least, despite having larger numbers of children. At tertiary level, the richest quintile of households captured more than two thirds of total participation, with much of the remainder being captured by the second richest quintile. Thus, primary education provision in Ghana may in this sense be considered relatively pro-poor while tertiary provision is decidedly pro-rich. Over time, the poorest two quintiles increased their share of primary and tertiary participation but reduced in their share of secondary provision.

**Table 4.5: Shares of total participation in public schooling by expenditure quintile**

| | Primary | | Secondary | | Tertiary | |
|---|---|---|---|---|---|---|
| **Quintile** | **1991/92** | **2005/06** | **1991/2** | **2005/06** | **1991/92** | **2005/06** |
| **Poorest** | 21.3 | 24.1 | 15.7 | 12.1 | 0.0 | 1.8 |
| **2nd** | 23.1 | 24.7 | 18.6 | 17.2 | 5.3 | 7.8 |
| **3rd** | 21.7 | 22.9 | 22.8 | 23.7 | 0.0 | 9.4 |
| **4th** | 19.4 | 17.6 | 21.4 | 23.3 | 21.1 | 14.1 |
| **Richest** | 14.5 | 10.7 | 21.6 | 23.8 | 73.7 | 66.9 |

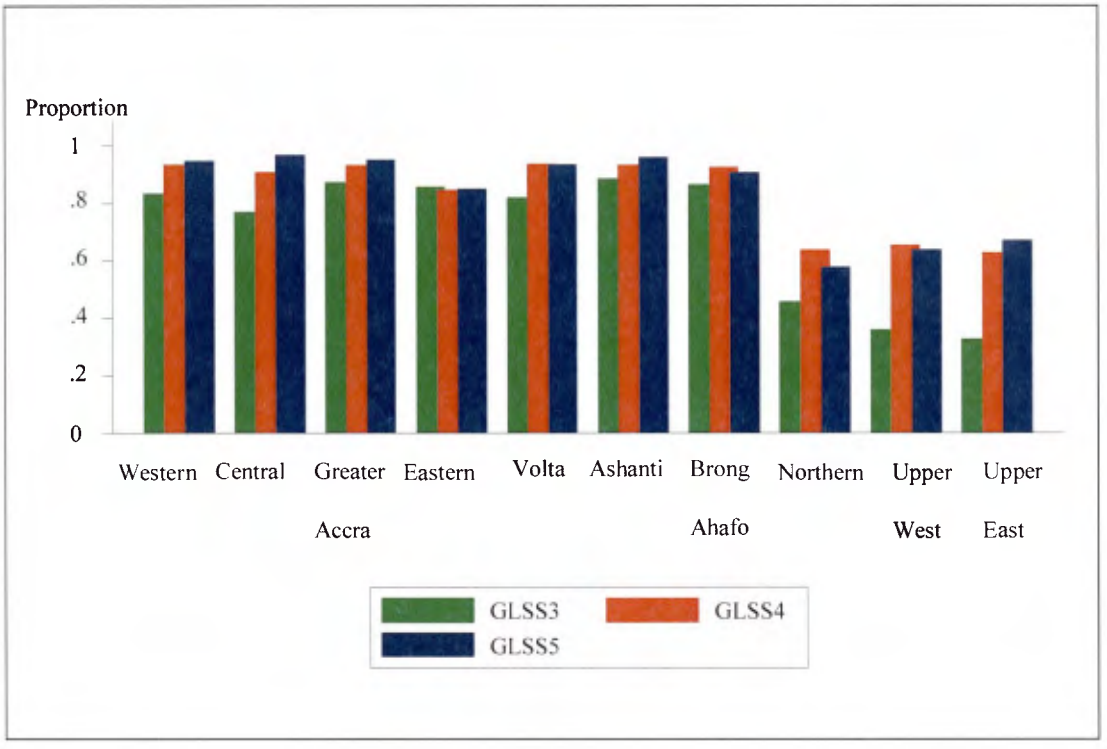
Source: Coulombe and McKay (2007)

Participation in basic education may be understood in terms of a number of access dimensions considered in the CREATE analytic model (see Lewin 2007) outlined in Chapter One – initial access, retention and drop-out and completion. 'Meaningful access' also includes a 'quality' dimension which is considerably more difficult to conceptualise and measure. Consideration is given to these dimensions of access below.

*Initial access*

Among those in the 5-18 age group who were not attending school at the time of the GLSS surveys were children who had never attended school and those who had ceased attending school. Mean rates of ever-attendance by region and survey round are shown in Figure 4.13. Overall rates in the 5-18 age group show an increase at the national level between GLSS 3 and 4 from 77 to 87 per cent, remaining stable at 87 per cent in GLSS 5. The three northern regions show notably lower mean levels of ever-attendance but these increased dramatically over the period from GLSS 3 to 4 but not thereafter. Most other regions generally showed moderate increases in ever-attendance rates across the surveys, much of which occurred in the early part of the period. As many as two thirds of children in the Upper East region in 1991/2 had never attended school, compared to only 3 per cent of children in the Central region by 2005/6.

**Figure 4.13: Ever-attendance of 5-18 year olds by region and survey round**



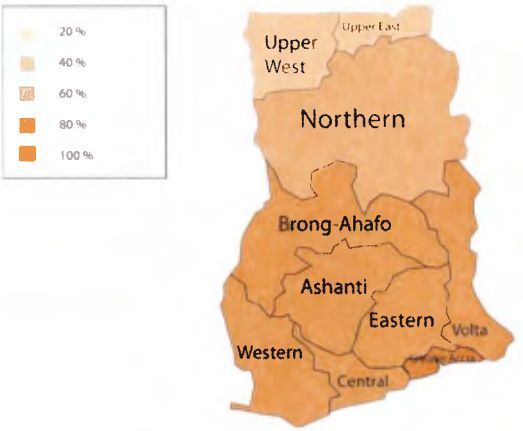

Source: Computed from GLSS 3-5

*Retention and drop-out*

Table 4.6 shows the figures for the mean level of current attendance at school by region, defined at the time of the survey visit for the same age range, and also at ages 7 and 14 specifically. Figures are expressed as proportions of all children in the age-range, including those who had never attended school. In common with the ever-attendance results, the period between 1991/2 and 2005/6 was found to be characterized by a ten percentage point increase in the overall rate of current attendance (from 0.71 to 0.81), which also appears to have occurred mainly in the period from 1991/2 to 1998/9. The figures show that current attendance rates, like ever-attendance rates were substantially lower across the age range for the three northern regions, illustrated for GLSS 3 in Figure 4.14. At age 7, between 7 and 26 per cent of children were not attending school in 1991 outside the northern regions. In the north, this ranged from 54 to 78 per cent. The figures for the north had improved substantially by 1998/9 when 30 to 31 per cent were not attending, but this growth in current attendance rates does not appear to have been sustained thereafter since the figures for 2005/6 ranged from 31 to 48 per cent. However, regional results should be interpreted cautiously since the GLSS data are not

strictly representative at the regional level. Moreover, current attendance nationally at age 14 appears to have fallen from 86 per cent in 1998/9 to 81 per cent in 2005/6, while it remained static at age 7 over this period at 84 per cent. When current attendance is considered only in relation to those who had ever attended school, there is surprisingly little variation over the period, with 88 per cent of those who had ever attended currently attending in 1991/2, and 89 per cent in both 1998/9 and 2005/6.

**Figure 4.14: Percentage of children (aged 5-17) currently attending school by region in 1991/2.**




Source: Computed from GLSS 3

**Table 4.6: Proportions of children aged 5-17 who were currently attending school by region and survey round**

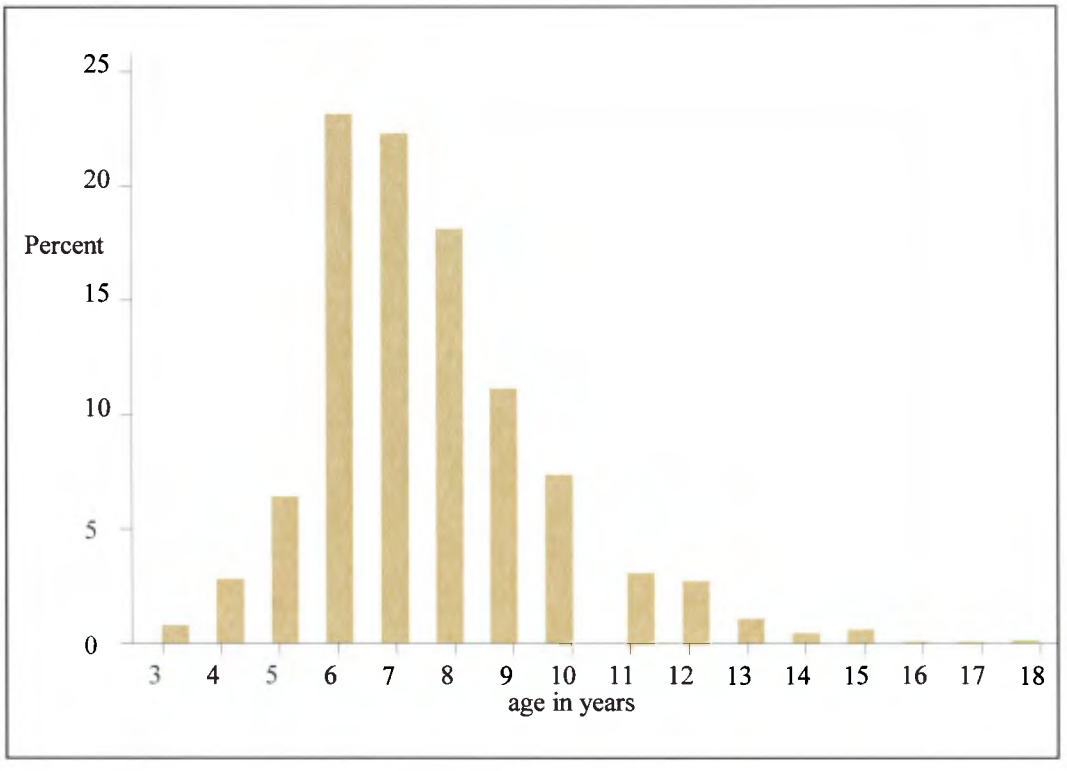
| | Age 7 | | | Age 14 | | | Total age 5-17 | | |
|---|---|---|---|---|---|---|---|---|---|
| | GLSS 3 | GLSS 4 | GLSS 5 | GLSS 3 | GLSS 4 | GLSS 5 | GLSS 3 | GLSS 4 | GLSS 5 |
| Western | 0.76 | 0.91 | 0.94 | 0.77 | 0.91 | 0.83 | 0.75 | 0.89 | 0.89 |
| Central | 0.74 | 0.86 | 0.92 | 0.78 | 0.93 | 0.88 | 0.71 | 0.85 | 0.90 |
| Greater Accra | 0.81 | 0.92 | 0.91 | 0.88 | 0.95 | 0.87 | 0.82 | 0.87 | 0.89 |
| Eastern | 0.83 | 0.75 | 0.83 | 0.90 | 0.79 | 0.87 | 0.80 | 0.80 | 0.79 |
| Volta | 0.73 | 0.90 | 0.88 | 0.79 | 0.89 | 0.94 | 0.77 | 0.87 | 0.86 |
| Ashanti | 0.83 | 0.93 | 0.97 | 0.81 | 0.88 | 0.84 | 0.79 | 0.86 | 0.89 |
| Brong Ahafo | 0.82 | 0.85 | 0.91 | 0.88 | 0.93 | 0.82 | 0.79 | 0.88 | 0.86 |
| Northern | 0.46 | 0.70 | 0.52 | 0.44 | 0.68 | 0.58 | 0.44 | 0.60 | 0.55 |
| Upper West | 0.35 | 0.69 | 0.63 | 0.31 | 0.68 | 0.58 | 0.34 | 0.64 | 0.60 |
| Upper East | 0.22 | 0.69 | 0.69 | 0.48 | 0.57 | 0.64 | 0.32 | 0.57 | 0.64 |
| Total | 0.71 | 0.84 | 0.84 | 0.77 | 0.86 | 0.81 | 0.71 | 0.81 | 0.81 |

Source: Computed from GLSS 3-5

The difference between the proportions of children who had ever attended and those who were currently attending indicates the prevalence of drop-out. Although the nominal age at which basic education ends in Ghana is 14 or 15, late enrolment, grade

repetition and periods of absence mean that few children reach the end by this age. Hence, the age range in the tables and figure is extended to 17 to allow for a two to three year 'age-grade delay'. The prevalence of late enrolment in grade 1, apparently the dominant cause of age-grade delay, is shown for GLSS 5 in Figure 4.15. Estimates of drop-out are shown in Table 4.7. These are the differences between the percentages of children who reported ever having attended school and those who were currently attending in the age-range (5-17) within which children would normally be expected to be attending school, taking account 'age-grade delay'. As a percentage of all children in the age range, drop-out affected an estimate of between 1 and 10 per cent of the age group according to region with no clear trend over the time period. The national figure remained constant over the period at around 6 per cent. Although the figures are lower for the northern regions, because ever-attendance is lower in these regions they represent similar proportions of those who had ever been to school.

**Figure 4.15: Enrolment in primary Grade 1 by age (GLSS 5)**




Source: Computed from GLSS 5

Table 4.7: **Percentages of children aged 5-17 who had 'dropped-out' of basic education by region and survey round**

| | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|
| Western | 8 | 5 | 6 |
| Central | 6 | 6 | 7 |
| Greater Accra | 5 | 6 | 6 |
| Eastern | 6 | 5 | 6 |
| Volta | 5 | 7 | 7 |
| Ashanti | 10 | 7 | 7 |
| Brong Ahafo | 7 | 5 | 5 |
| Northern | 2 | 4 | 3 |
| Upper West | 2 | 1 | 4 |
| Upper East | 1 | 6 | 3 |
| Total | 6 | 6 | 6 |

Source: Computed from GLSS 3-5

It is important to view these estimates of proportions of children attending and dropping-out of school in the light of estimates of population size and of population growth. Table 4.8 uses multiples provided by the Ghana Statistical Service to estimate figures for the population of Ghana at each of the three survey rounds from the sample data. It is clear that population growth in the 5-17 age group has been comparatively rapid, with the absolute size of the group having grown by more than fifty percent over the period. The number of children attending school in 2005/6 is estimated to be larger than the 1991/2 figure by more than three million. Clearly, in the presence of rapid population growth, static proportions represent large increases in absolute numbers and growth in the number of children in school has been dramatic.

**Table 4.8: Educational access (ages 5-17): Estimated population figures using GLSS 3-5 (millions)**

| | GLSS 3 (1991/2) | | GLSS 4 (1998/9) | | GLSS 5 (2005/6) | |
|---|---|---|---|---|---|---|
| | estimate | std. error | estimate | std. error | estimate | std. error |
| Population | 5.59 | 0.28 | 6.94 | 0.47 | 8.82 | 0.35 |
| Ever-attended | 4.28 | 0.23 | 5.80 | 0.40 | 7.52 | 0.29 |
| Currently-attending | 3.94 | 0.21 | 5.43 | 0.38 | 7.03 | 0.28 |
| Dropped-out | 0.34 | 0.03 | 0.37 | 0.03 | 0.49 | 0.03 |

Standard errors robust to data clustering Source: Computed from GLSS 3-5

The GSS conducted a Core Welfare Indicators Questionnaire (CWIQ) in 2003 (see GSS 2005) which included questions on attendance at school and on reasons for non-attendance, which are not included in GLSS. Among drop-outs nationally, the most

common reasons for not attending were that school was considered "useless" (27%) or too costly (25%).

*Completion*

Tables 4.9 and 4.10 report the proportions of children who had ever attended school in the age range 11-17 who had also completed primary school and in the age range 14-21 for those who had completed Junior High School (JHS). If it is assumed that the vast majority of children who will ever complete primary school will do so by age 17, then the data suggest that over the period, between one fifth and a quarter of children who had ever attended school in Ghana never completed their primary education. Figures from UIS reported in Table 4.4 show somewhat lower figures for 2002, reporting that 65 per cent of girls and 55 per cent of boys who began primary education survived to the last grade. Table 4.4 also provides data on the expected number of years of schooling and on transition rates, which are not available in GLSS data. The expected number of years of schooling for a girl was 6.4 in 1999 rising to 8.1 years in 2006 and to 9.3 in 2008. For boys, the school life expectancy was slightly longer, at 7.4, 8.7 and 9.8 years respectively. Among those who completed primary school, transition rates to Junior High School are found to be high at 86.8 per cent with little difference by gender. If it is assumed that the vast majority of children who will complete JHS will do so by age 20, then it appears from GLSS data that around two-fifths to a half of children who had ever attended school did not complete JHS.

Overall, completion rates for both the primary and lower secondary phases of education do not appear to have improved over the period. In 2005/6, 73 per cent of 17 year olds had completed primary school, compared with 74 per cent in 1992 (although the rate in 1999 was 80 per cent). UNICEF (2010) reports a comparable figure of 72% for 2003 and a figure of 75% for 2008 using data from the DHS. With regard to lower secondary school completion, rates also appear to have remained fairly static over the period overall, with around half having completed by age 20 in both 1991/2 and 2006/7. These groups of pupils would have enrolled initially between 1976 and 1993 however, so that these figures may not be interpreted in the light of initial enrolment rate gains in the mid and late 1990s. In the case of both primary and secondary completion, a lower proportion of children had completed by the earlier age measure (13 or 17) in 2006 than

in 1991, indicating a possible increase in age-delayed completion. Other patterns by region varied but may also be partly due to sampling issues, especially where regional samples were small.

**Table 4.9: Proportions of children who had completed primary school by age, region and survey round**

| | Age 13 | | | Age 17 | | | Total age 11-17 | | |
|---|---|---|---|---|---|---|---|---|---|
| | GLSS 3 | GLSS 4 | GLSS 5 | GLSS 3 | GLSS 4 | GLSS 5 | GLSS 3 | GLSS 4 | GLSS 5 |
| Western | 0.41 | 0.48 | 0.26 | 0.65 | 0.84 | 0.80 | 0.48 | 0.48 | 0.39 |
| Central | 0.36 | 0.38 | 0.30 | 0.75 | 0.79 | 0.75 | 0.44 | 0.41 | 0.44 |
| Greater Accra | 0.37 | 0.60 | 0.46 | 0.85 | 0.96 | 0.84 | 0.50 | 0.58 | 0.57 |
| Eastern | 0.41 | 0.29 | 0.28 | 0.83 | 0.81 | 0.79 | 0.47 | 0.40 | 0.33 |
| Volta | 0.42 | 0.44 | 0.33 | 0.76 | 0.85 | 0.87 | 0.42 | 0.48 | 0.44 |
| Ashanti | 0.42 | 0.51 | 0.35 | 0.85 | 0.85 | 0.87 | 0.52 | 0.52 | 0.48 |
| Brong Ahafo | 0.35 | 0.39 | 0.26 | 0.89 | 0.86 | 0.66 | 0.44 | 0.48 | 0.32 |
| Northern | 0.08 | 0.24 | 0.10 | 0.27 | 0.40 | 0.31 | 0.12 | 0.24 | 0.16 |
| Upper West | 0.26 | 0.49 | 0.10 | 0.57 | 0.77 | 0.43 | 0.24 | 0.35 | 0.18 |
| Upper East | 0.16 | 0.15 | 0.15 | 0.18 | 0.39 | 0.46 | 0.10 | 0.19 | 0.21 |
| Total | 0.35 | 0.42 | 0.28 | 0.74 | 0.80 | 0.73 | 0.42 | 0.44 | 0.39 |

Source: Computed from GLSS 3-5

**Table 4.10: Proportions of children who had completed JHS by age, region and survey round**

| | Age 15 | | | Age 20 | | | Total age 14-21 | | |
|---|---|---|---|---|---|---|---|---|---|
| | GLSS 3 | GLSS 4 | GLSS 5 | GLSS 3 | GLSS 4 | GLSS 5 | GLSS 3 | GLSS 4 | GLSS 5 |
| Western | 0.17 | 0.22 | 0.08 | 0.53 | 0.63 | 0.57 | 0.34 | 0.41 | 0.35 |
| Central | 0.22 | 0.17 | 0.09 | 0.41 | 0.45 | 0.58 | 0.31 | 0.32 | 0.36 |
| Greater Accra | 0.15 | 0.20 | 0.29 | 0.79 | 0.75 | 0.70 | 0.48 | 0.57 | 0.55 |
| Eastern | 0.30 | 0.13 | 0.04 | 0.54 | 0.67 | 0.50 | 0.48 | 0.38 | 0.27 |
| Volta | 0.08 | 0.25 | 0.15 | 0.37 | 0.49 | 0.56 | 0.29 | 0.42 | 0.39 |
| Ashanti | 0.18 | 0.21 | 0.12 | 0.54 | 0.74 | 0.66 | 0.43 | 0.47 | 0.41 |
| Brong Ahafo | 0.13 | 0.15 | 0.06 | 0.63 | 0.74 | 0.53 | 0.38 | 0.37 | 0.28 |
| Northern | 0.00 | 0.04 | 0.02 | 0.11 | 0.34 | 0.27 | 0.08 | 0.19 | 0.12 |
| Upper West | 0.05 | 0.00 | 0.04 | 0.17 | 0.17 | 0.23 | 0.16 | 0.16 | 0.12 |
| Upper East | 0.00 | 0.02 | 0.01 | 0.08 | 0.33 | 0.24 | 0.03 | 0.24 | 0.13 |
| Total | 0.14 | 0.17 | 0.11 | 0.49 | 0.58 | 0.53 | 0.35 | 0.39 | 0.34 |

Source: Computed from GLSS 3-5

### 4.3 School Quality

When asked about satisfaction with schooling in the CWIQ survey (see GSS 2005), 68 per cent of households replied that they were satisfied with primary school provision and 74 per cent were satisfied with Junior High School. Among those who were not satisfied, 43 per cent said lack of books and supplies was a reason for dissatisfaction, 35 per cent cited poor facilities, 37 per cent a lack of furniture, 30 per cent a lack of teachers and 17 per cent poor quality teaching. The quality of schooling is clearly important with respect to the determination of both schooling access (demand for schooling) and to the income and welfare benefits of education. One summary indicator of quality is found in education spending. Total public real expenditure on basic education in Ghana increased steadily between 1991 and 2006, increasing at the primary level by as much as an estimated 80% between 2000 and 2005 (see Rolleston 2009), but enrolments also increased substantially, so that changes in per-pupil expenditure have been small. Indeed, Penrose (1998) estimates basic-level real per pupil expenditure to have been approximately constant between 1990 and 1997.

EMIS data collected since 2001 include a range of simple indicators of basic quality dimensions. Table 4.11 summarises the data using the district level database for 2004/5. Pupil teacher ratios (PTRs) were generally low at JHS level. At primary level, in three quarters of districts the ratio was 40:1 or less, but in the remainder, especially in the North they were higher, reaching a maximum of 72:1. In the median district, one textbook was available per pupil in the core subjects at primary level on average, although in the least advantaged quarter of districts on this indicator the figure was somewhat lower. Differences in the percentages of male teachers who were trained were larger, ranging from almost 98% in one district at JHS level to 13.2% in another. Again, teachers were less likely to be trained in the North. Around one third of classrooms needed major repairs on average, with notable variation, ranging from zero to 57%. Variation in BECE pass rates in mathematics was not typically wide, but nonetheless ranged from a low of less than 50% to a high of almost 100%. It is important to note that rates of enrolment and progression vary widely by district, however so that in some districts a much higher proportion of the school-age population reaches the BECE. At primary level, the NER ranged from around 37 to 97 percent by district, and at JHS from 7 to 64%.

**Table 4.11: Example school quality indicators: Ghana districts (2004/5)**

| Median /Quartile | Pupil Teacher Ratio | | Core Text Books Per Pupil | | Trained Teachers (Male) % | | Schools Needing Major Repairs % | | BECE Maths Pass Rates % | Net Enrolment Rates % | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pri | JHS | Pri | JHS | Pri | JHS | Pri | JHS | | Pri | JHS |
| Minimum | 24.0 | 14.0 | 0.2 | 0.1 | 15.1 | 13.2 | 9.3 | 0.0 | 45.5 | 36.6 | 6.9 |
| Q1 | 30.0 | 17.0 | 0.8 | 1.4 | 50.3 | 72.7 | 22.4 | 24.9 | 65.6 | 53.9 | 19.3 |
| Median | 34.0 | 18.0 | 1.0 | 1.7 | 62.3 | 79.1 | 29.0 | 33.3 | 70.8 | 60.0 | 26.7 |
| Q3 | 40.8 | 22.0 | 1.1 | 2.1 | 79.1 | 86.6 | 35.7 | 40.1 | 78.3 | 64.6 | 34.7 |
| Maximum | 72.0 | 38.0 | 1.8 | 3.3 | 95.1 | 97.9 | 56.3 | 57.0 | 97.6 | 96.7 | 63.7 |

Source: Computed from EMIS data (2004/5)

Table 4.12 shows the trends in indicators between 2001 and 2009. The proportion of schools with toilet facilities declined slightly, while those with drinking water increased. Indicators of classroom state of repair, textbook availability, examination pass rates and PTRs remained largely constant, while there appears to have been some reduction in repetition at primary level. The percentage of both male and female teachers who were trained declined, especially at primary level, most likely owing to the need to recruit large numbers of teachers given rising pupil numbers and constant PTRs.

**Table 4.12: Change in example school quality indicators 2001-2009**

| Indicator | Primary | | | JHS | | |
|---|---|---|---|---|---|---|
| | 2001/2 | 2005/6 | 2008/9 | 2001/2 | 2005/6 | 2008/9 |
| Toilet (%) | 68 | 45 | 50 | 61 | 49 | 54 |
| Drinking water (%) | 38 | 50 | 62 | 42 | 50 | 62 |
| Major repairs needed to classrooms (%) | - | 30 | 25 | - | 30 | 26 |
| Core subject textbooks per pupil | 1.8 | 1.8 | 1.6 | 2.7 | 2.5 | 2.1 |
| Trained teachers male (%) | 69 | 58 | 48 | 85 | 77 | 72 |
| Trained teachers female (%) | 92 | 84 | 77 | 95 | 92 | 91 |
| Pupil-Teacher Ratio (PTR) | 33 | 38 | 34 | 19 | 19 | 18 |
| Repeaters (%) | 8 | 5 | 4 | 4 | 4 | 3 |
| BECE maths pass rate (%) | | | | 58 | 59 | 59 |

Source: Computed from EMIS data 2001-2009

A World Bank evaluation study examined changes in quality indicators between 1988 and 2003 and found some general improvement on simple measurable indicators (see World Bank 2004b). Table 4.13 shows an example of results, indicating improvements in all-weather classroom availability, chalkboards, water supplies and library provision. However, they also examined equity in the distribution of resources according to community-level income, region and urban or rural location and found that with respect

to almost all indicators, schools serving higher income communities were better resourced in both 1988 and 2003, with regional disparities widening and urban/rural disparities narrowing over the period.

**Table 4.13: Improvements in school Quality Indicators in Ghana 1988-2003**

| | Primary | Middle/ JSS | Total |
|---|---|---|---|
| Adequate classrooms | - | - | - |
| Classrooms which cannot be used when raining | *** | - | *** |
| Percentage of classrooms with a chalkboard | *** | *** | *** |
| Chalkboard quality | *** | *** | *** |
| Own water supply | *** | *** | *** |
| Library | - | ** | ** |

*** significant at 1%, ** significant at 5%, * significant at 10%, and – indicates no significant change

Source: World Bank (2004b)

### 4.4 Education and Children's Work

Table 4.14 reports the mean values of indicators of children's work status. It shows that over the period, the proportion of children undertaking work (other than domestic chores) fell from around thirty percent to sixteen percent, largely because of a decline in children reporting involvement in agricultural work. Only a very small fraction of children were reported to be involved in waged work, self-employment or unpaid work, while up to a quarter were involved in farm work. Table 4.15 reports the mean values for ever-attendance and current-attendance by work category. In GLSS 3, there was little difference between the ever-attendance rates of working and non-working children, although this difference became substantial by GLSS 4 and continued to grow to GLSS 5 so that in 2006, 92 percent of non-working children had attended school while only 62 percent of children in farm work had attended. With regard to current attendance, differences are large and grew across the survey rounds. 92 percent of non-working children were attending in each of the surveys while the figure for waged children fell from 36 percent to 6 percent and for farm workers from 82 to 71 percent.

**Table 4.14: Children's work status (age 5 to 19)**

| Work category | Pooled GLSS | | GLSS 3 | | GLSS 4 | | GLSS 5 | |
|---|---|---|---|---|---|---|---|---|
| | mean | se | mean | se | mean | se | mean | se |
| No work | 0.793 | 0.008 | 0.692 | 0.015 | 0.815 | 0.014 | 0.842 | 0.010 |
| Waged work | 0.006 | 0.001 | 0.008 | 0.002 | 0.006 | 0.001 | 0.006 | 0.001 |
| Self-employment | 0.012 | 0.001 | 0.022 | 0.003 | 0.012 | 0.002 | 0.005 | 0.001 |
| Farm work | 0.161 | 0.007 | 0.260 | 0.016 | 0.115 | 0.012 | 0.131 | 0.010 |
| Observations | 31922 | 31922 | 8300 | 8300 | 10142 | 10142 | 13480 | 13480 |

standard errors robust to data clustering Source: Computed from GLSS 3-5

**Table 4.15: Children's work and school attendance GLSS 3-5**

| Work category | Mean level of ever-attendance by work category | | | | | | Mean level of current-attendance by work category | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GLSS 3 | | GLSS 4 | | GLSS 5 | | GLSS 3 | | GLSS 4 | | GLSS 5 | |
| | mean | se | mean | se | mean | se | mean | se | mean | se | mean | se |
| None | 0.78 | 0.01 | 0.89 | 0.01 | 0.91 | 0.01 | 0.92 | 0.01 | 0.92 | 0.00 | 0.92 | 0.00 |
| Waged | 0.75 | 0.08 | 0.74 | 0.09 | 0.68 | 0.06 | 0.36 | 0.09 | 0.26 | 0.10 | 0.06 | 0.04 |
| Self-employed | 0.72 | 0.03 | 0.79 | 0.05 | 0.77 | 0.06 | 0.57 | 0.06 | 0.33 | 0.08 | 0.21 | 0.06 |
| Farm | 0.75 | 0.02 | 0.74 | 0.04 | 0.62 | 0.04 | 0.82 | 0.01 | 0.69 | 0.03 | 0.71 | 0.03 |
| Unpaid | 0.77 | 0.05 | 0.84 | 0.04 | 0.79 | 0.04 | 0.75 | 0.05 | 0.79 | 0.03 | 0.28 | 0.05 |

standard errors robust to data clustering Source: Computed from GLSS 3-5

### 4.5 Costs of Education and Distance to School.

Over the period from 1991-2006, GLSS data show that mean spending on education per household showed a steep increase in real terms from around 93000 Cedis to around 510000 Cedis at constant 1999 prices. Table 4.16 summarizes data taken from GLSS 4 and from data reported by the Ghanaian education ministry cited in Canagarajah and Ye (2001). Both sets of data pertain to 1998, allowing an indicative comparison between 'private' and 'social' costs for that year, the mid-point in the period covered by this study. GLSS 4 collected information at the household level on annual expenditure per household member attending an educational establishment at some point during the 12 month period covered by the survey. The total figures shown for 'private expenditure' are the sums of expenditure on school registration, fees, PTA contributions, uniforms, sports clothes, books, school supplies, transportation to and from school, food, board and lodging at school and 'other expenses' including in-kind contributions, clubs and extra classes. This represents a fairly comprehensive measure of costs intended to include both direct and indirect costs of education. It does not include a measure of the private opportunity cost, however. Social expenditure shown in the table is the annual

unit cost of education calculated by dividing the total government expenditure on a particular level of education by the number of students enrolled at that level.

The data show that private expenditure on education in 1998 was higher than government expenditure per student except at the level of higher education. Households in Ghana meet more than half of all education expenditures on primary and senior secondary education, more than two thirds at junior secondary level but less than one third at the level of higher education. The absolute figures show the increasing cost of education to both households and the government at progressively higher levels of education, with government spending more than twenty times as much per student per year on university education as compared to primary and households countrywide approximately eight times as much.

Table 4.16: **Annual education expenditures (000s 1999 Cedis)**

| | Private Exp. | Social Exp. | Total Exp. | Private Exp. as % of total | Social Exp. as % of total |
|---|---|---|---|---|---|
| Primary | 122 | 121 | 277 | 56 | 44 |
| JSS | 423 | 191 | 656 | 71 | 29 |
| SSS | 636 | 486 | 1107 | 56 | 44 |
| Higher (tertiary) | 965 | 2488 | 3522 | 29 | 71 |

Sources: GLSS 4 and Table 4, Canagarajah and Ye (2001)

The mean time spent travelling to school in the pooled GLSS surveys for 6-17 year olds was fairly constant over the period at around 0.6 hours. The 2003 CWIQ found that 89 per cent of pupils lived within approximately half an hour's travelling distance to school with only 3 per cent needing to travel for more than an hour.

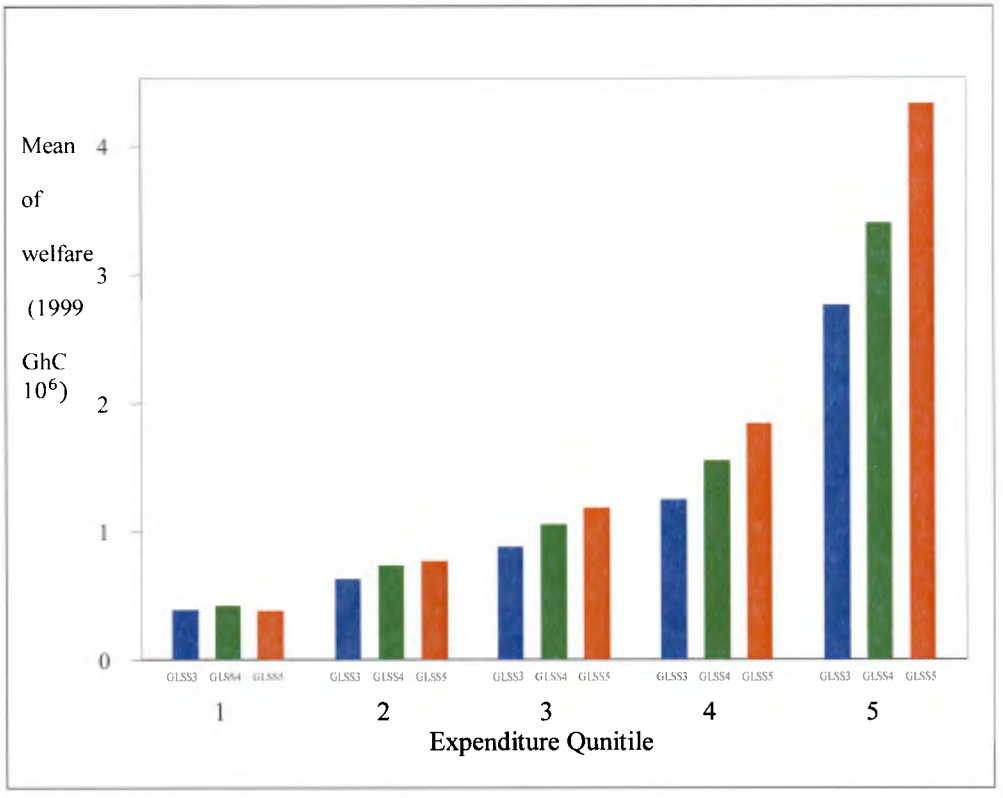
### 4.6 The Ghanaian Economy 1991-2006: Poverty and Inequality

Nutritionally based poverty lines set by the Ghana Statistical Service define extreme poverty at an annual level of consumption expenditure (welfare) below 700,000 Cedis at 1999 prices (in Accra) and define poverty at 900,000 Cedis (see GSS 2007a). The lower line is intended to denote an expenditure level below which food subsistence is jeopardized while the upper line takes account of basic non-food requirements. There was little change over the period from 1991-2006 in the mean welfare of poor households, although of course these values are limited by the poverty line definitions.

The non-poor, however, improved their welfare notably. The pattern is seen more clearly when examined by welfare quintile as in Figure 4.16. The poorest welfare quintile is found to enjoy fractionally lower welfare in 2006 than in 1991. For other quintiles, welfare levels improved, with larger improvements being enjoyed by the higher welfare groups. The most advantaged quintile in terms of per capita household welfare enjoyed 7.03 times greater mean welfare than the least advantaged quintile in 1991/2, 8.07 times greater welfare in 1998/9 and 11.26 times greater welfare in 2005/6, indicating a general increase in welfare inequality.

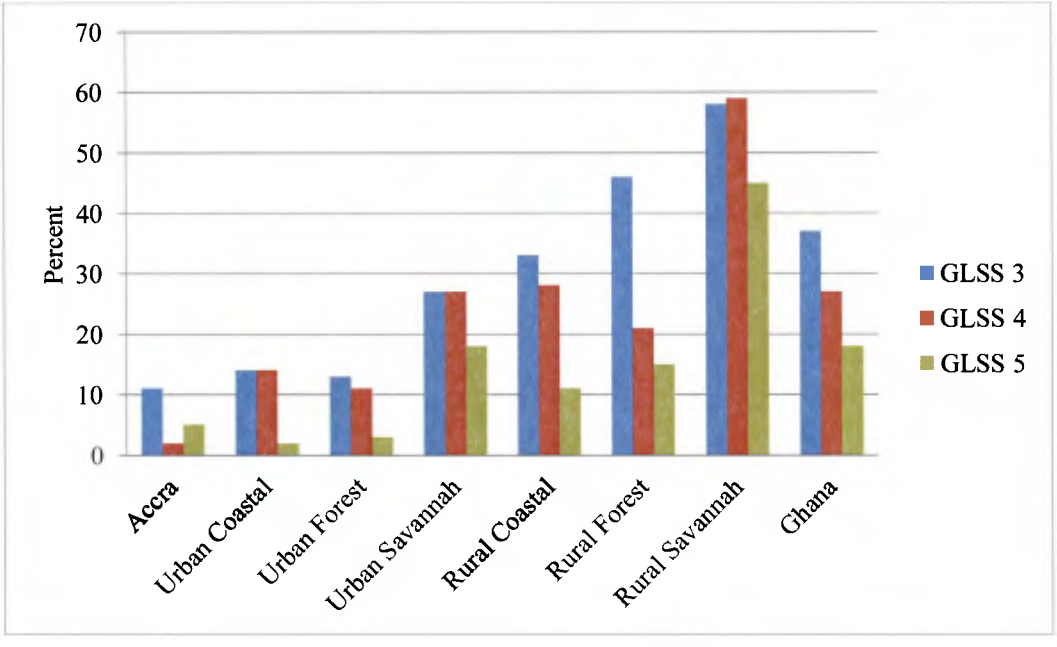
Nonetheless, in terms of absolute poverty, fewer households suffered from this form of deprivation. Extreme poverty fell from 36 percent of households in 1991/2 to 27 per cent in 1998/9 and 18 per cent in 2005/6. The rates for poverty overall were 52 per cent, 40 per cent and 29 per cent respectively (GSS 2007a). Regional differences in the incidence of absolute poverty are found to be marked, as shown in Figure 4.17 for extreme poverty and figures 4.18 and 4.19 in relation to poverty overall. Rural areas have much higher incidences of extreme poverty, in particular the rural savannah, although these declined over the period. In Accra the incidence of extreme poverty rose between 1998/9 and 2005/6, possibly owing to migration (see GSS 2007a). Overall, however, despite population growth, the number of Ghanaians in poverty fell from an estimated 7.93 million in 1991/2 to 6.18 million in 2005/6 (GSS 2007a). Coulombe and McKay (2007) conclude that "Ghana has achieved substantial poverty reduction over the last 15 years and is on track to reduce its poverty rate by half versus the level of 1990 well before the target date of 2015". They also note, however that despite recent poverty reduction, from the limited available data there are indications that the incidence of equivalent conceptions of poverty would have been lower in the 1960s, prior to a prolonged period of economic decline.

**Figure 4.16: Mean household welfare by expenditure quintile and survey round**



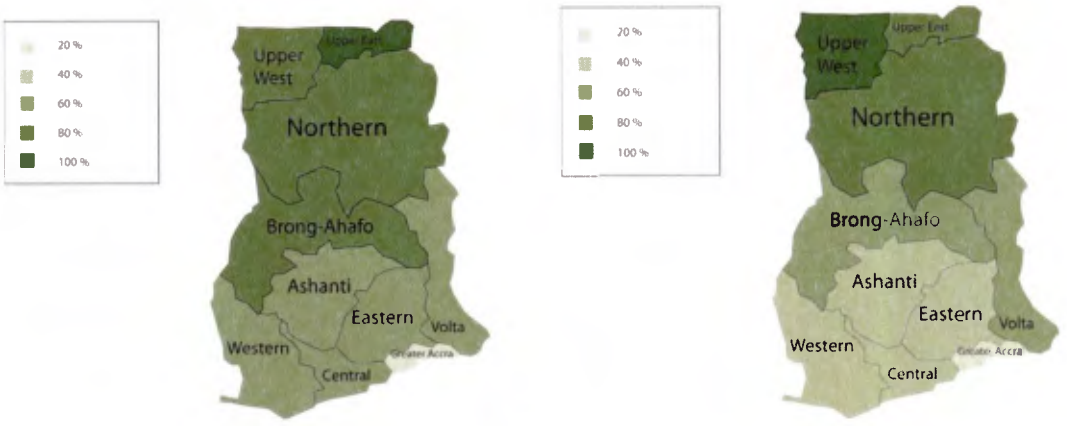

Source: Computed from GLSS 3-5

**Figure 4.17: Incidence of extreme poverty by locality (GLSS 3-5)**



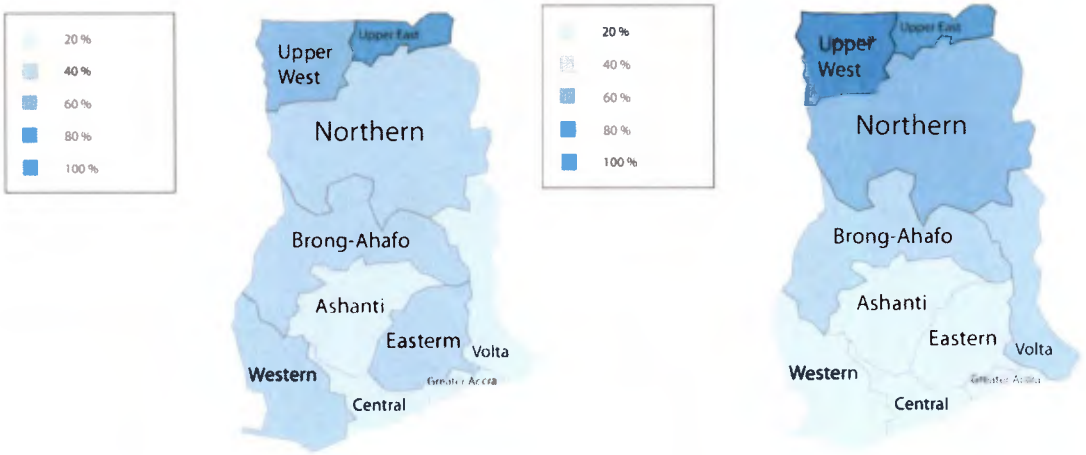

Source: GSS (2007a)

**Figure 4.18: Poverty incidence by region in Ghana: Percentage of the population living in poverty 1991/2 and 2005/6**




Source: Computed from GLSS 3 and 5

**Figure 4.19: Poverty incidence by region in Ghana: Percentage of poor households 1991/2 and 2005/6**

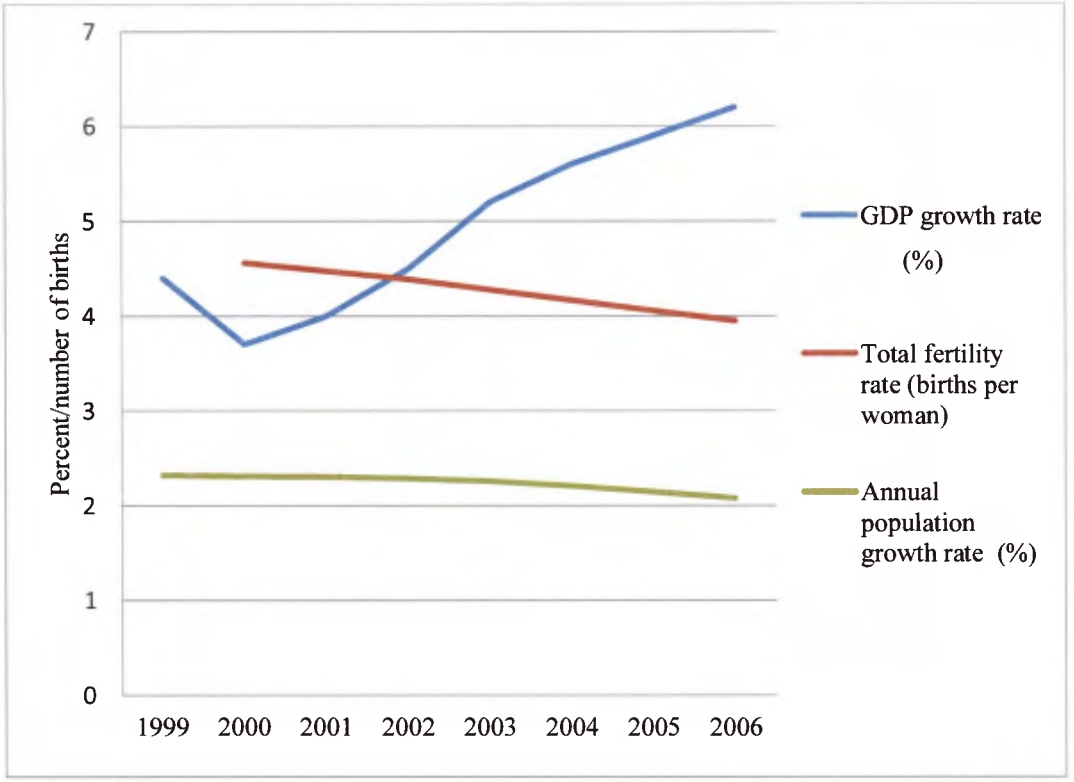



Source: Computed from GLSS 3 and 5

Total consumption in Ghana increased by more than 8 per cent per year on average between GLSS 3 and 5; and taking into account population growth, mean per capita consumption (welfare) increased by around 3 percent per year. These figures are consistent with sustained economic growth in the country which averaged around 4.7 percent in the early period, rising thereafter to 5.0 percent or more in the latter period when account is taken of the fact that food and import prices did not rise as quickly in Ghana as costs of production; so that real consumption growth exceeded GDP growth (see Coulombe and McKay 2007). The more recent pattern of growth is shown in

Figure 4.20 below alongside demographic trends which demonstrate falling fertility and population growth rates.

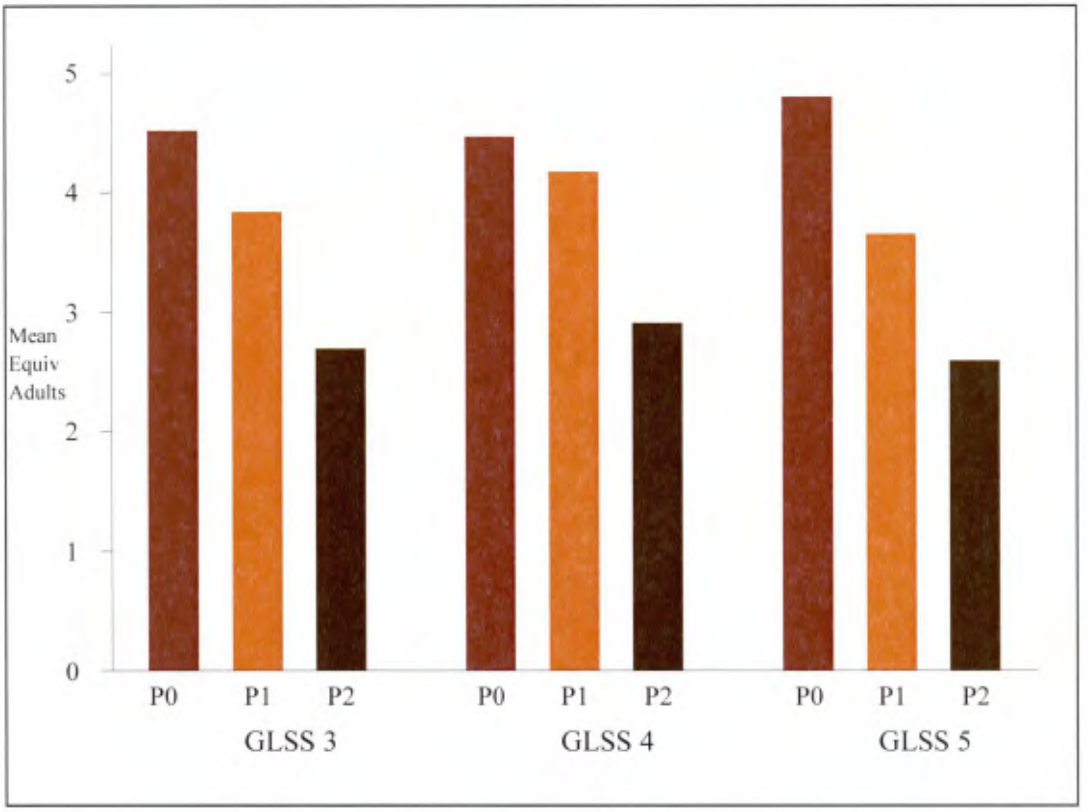
**Figure 4.20: Economic growth and demographic trends in Ghana 1999-2006**




Source: UIS

Since welfare and absolute poverty are defined in per capita terms at the household level, household size is an important factor affecting these outcomes. Figure 4.21 shows the mean household size in terms of equivalent adults on a calorific consumption scale, according to household poverty status. Extremely poor households had a mean household size of around 4.5 adults in GLSS 3 rising to 4.8 adults by GLSS 5. Poor households comprised around 3.8 equivalent adults in GLSS 3 and 3.6 in GLSS 5. Non-poor households comprised only around 2.7 adults in GLSS 3 falling to 2.6 in GLSS 5.

**Figure 4.21: Household size in equivalent adults by poverty status and survey round**




P0: Extremely poor P1: Poor P2: Not Poor. Source: Computed from GLSS 3-5

When inequality and the related issue of relative poverty are concerned, while growth has benefitted most groups, it is instructive to consider the effects of redistribution over the period. The GSS report results of a decomposition exercise which separates the total change in welfare into effects of growth and redistribution (GSS 2007a). The results are reproduced in Table 4.17. It is clear that the benefits of growth for poverty reduction were large, but were partly offset by countervailing redistributive effects whereby welfare was redistributed in favour of the non-poor. The growth incidence curve shown in Figure 4.22 illustrates the trend, showing that increases were greater at higher levels of consumption, indicating that growth was relatively pro-rich and inequality-increasing. The curve shows the growth between 1991 and 2006 in median consumption expenditures at each percentile of the distribution of consumption (shown on the x-axis), connected by an interpolating curve – the median spline. Values on the y-axis thus represent the consumption growth rates (at the median) for each percentile of the consumption distribution. Coulombe and McKay (2007) report Gini co-efficients which confirm this – in terms of per capita incomes they calculated 0.526, 0.573 and

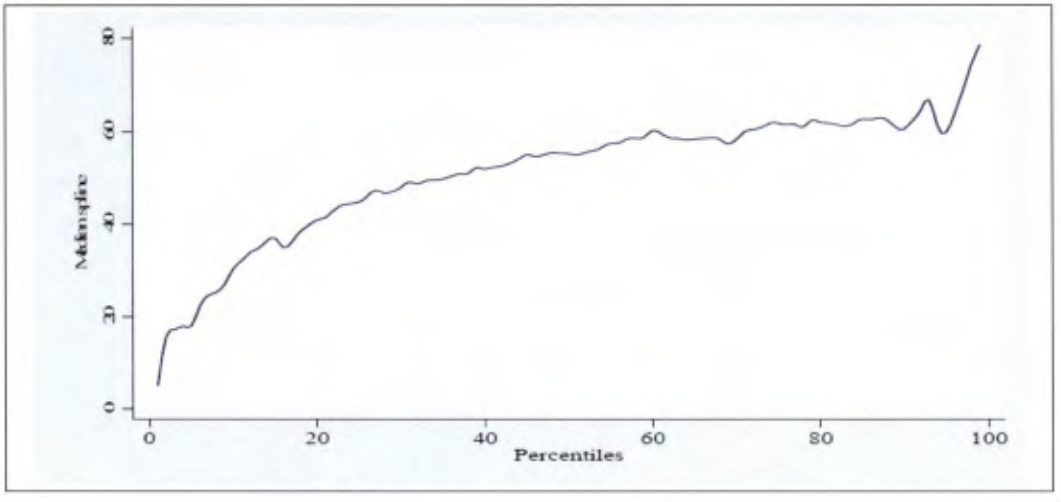
0.657 for 1991/2, 1998/9 and 2005/6 and for consumption 0.373, 0.388 and 0.425 respectively. The figure of minus 27.5 percentage points in Table 4.16 for the share of change in poverty due to growth nationally would, in the absence of countervailing redistribution, have been sufficient to meet the MDG of halving poverty.

**Table 4.17: Decomposition of changes in poverty incidence (1991-2006)**

| | | Share of change due to: | |
|---|---|---|---|
| | Total Change | Growth in real consumption per equivalent adult in the survey | Redistribution (change in inequality in consumption in the survey) |
| *1991/92 to 1998/99* | | | |
| National | -12.3 | -13.1 | 0.9 |
| Urban | -8.3 | -10.7 | 2.4 |
| Rural | -14.0 | -14.4 | 0.3 |
| *1998/99 to 2005/06* | | | |
| National | -10.9 | -13.5 | 2.6 |
| Urban | -8.6 | -8.6 | 0.0 |
| Rural | -10.4 | -13.8 | 3.4 |
| *1991/92 to 2005/06* | | | |
| National | -23.2 | -27.5 | 4.3 |
| Urban | -16.9 | -20.0 | 3.1 |
| Rural | -24.4 | -28.7 | 4.3 |

Source: GSS (2007a)

**Figure 4.22: Consumption growth incidence curve: Ghana 1991-2006**



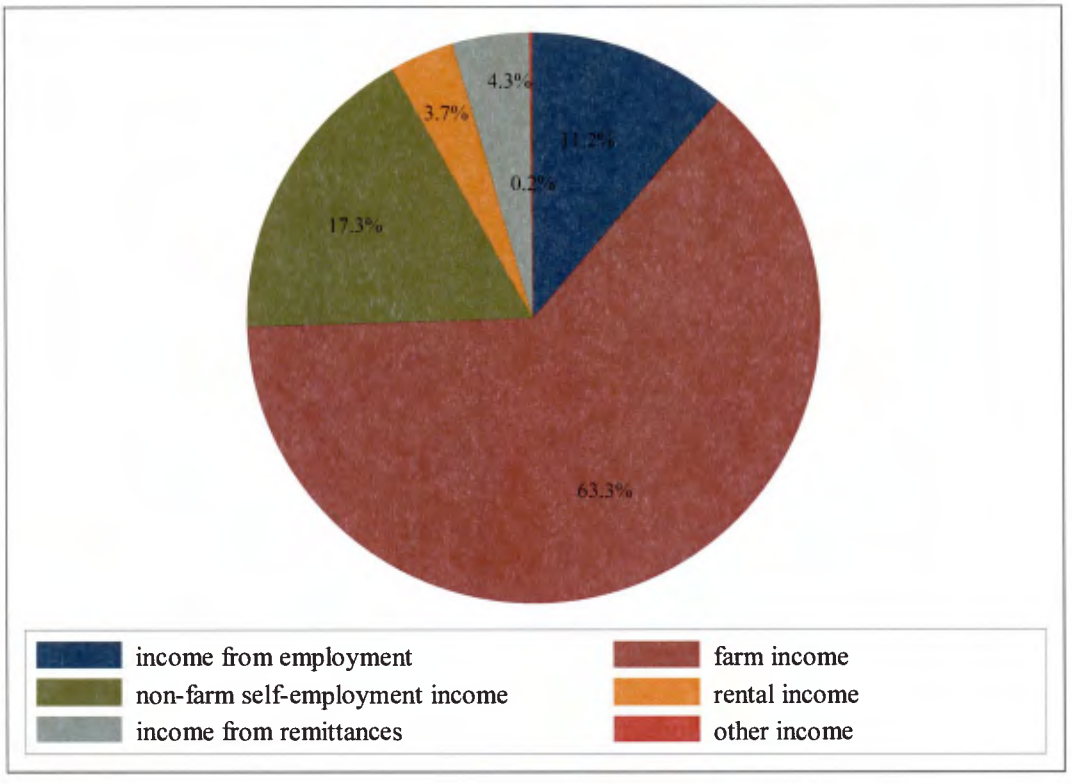

Source: GSS (2007a)

## 4.7 The Ghanaian Economy 1991-2006: Incomes, Employment and Education

The sources of income which partly determine household consumption are found to differ markedly by household poverty status. Figure 4.23 below shows the mean

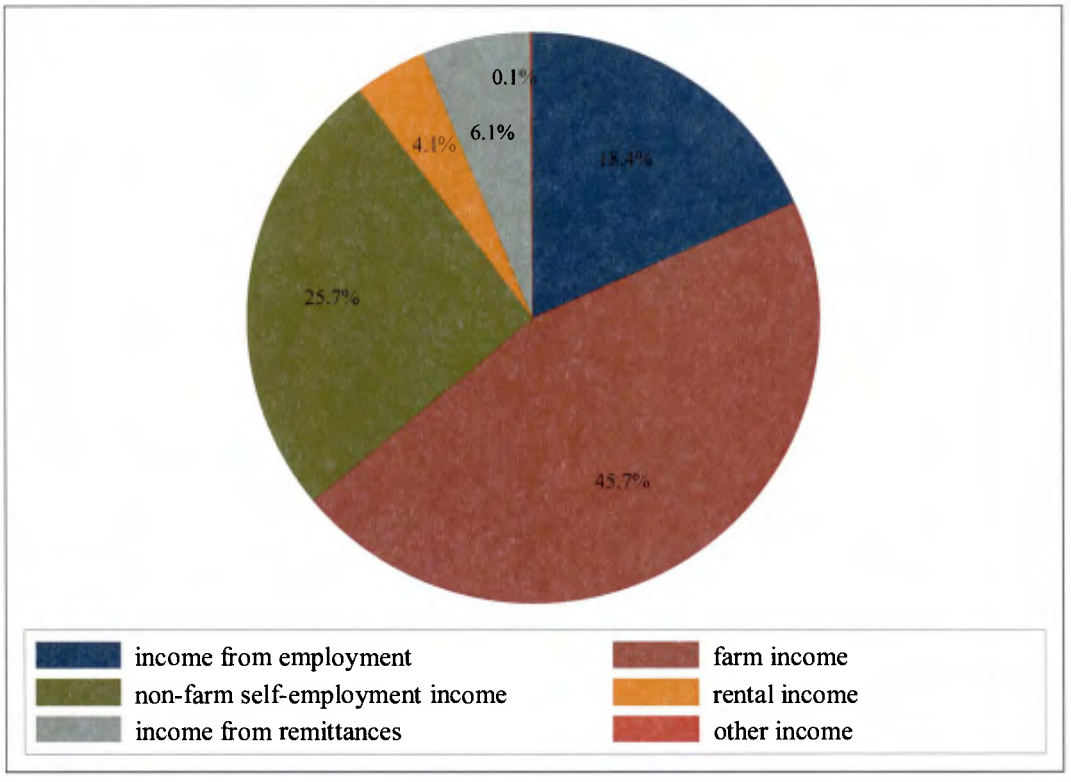
composition of total household income for the extremely poor group in the GLSS 5 survey. Almost two-thirds of income is derived from household agricultural activities. Of the remainder, around half is derived from self-employment and around 11 per cent of the total is derived from employment earnings. In the poor group (Figure 4.24), agricultural activities comprise less than half of household income, self-employment a quarter and employment around 18 percent. For the non-poor group (Figure 4.25), agricultural activities contribute less than one fifth of total household income, self-employment just less than one third and employment almost four fifths. Income from remittances rises as a proportion of total household income from around 4 per cent for the extremely poor to 10 per cent for the non-poor. Coulombe and McKay (2007) note that the benefits from remittances accrue much more to richer and urban households and that their importance, especially in terms of international remittances is rising.

**Figure 4.23: Sources of income for extremely poor households (GLSS 5)**



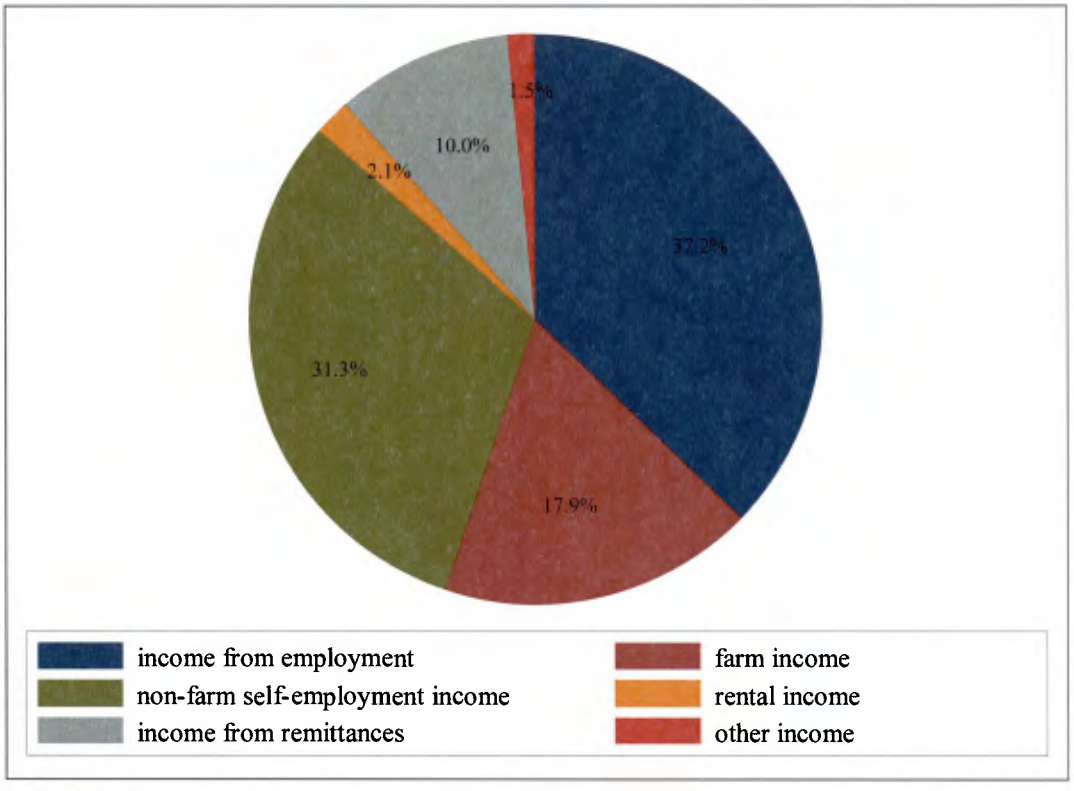

Source: Computed from GLSS 5

**Figure 4.24: Sources of income for poor households (GLSS 5)**




Source: Computed from GLSS 5

**Figure 4.25: Sources of income for non-poor households (GLSS 5)**




Source: Computed from GLSS 5

Over the period from 1991-2006, the proportion of adults in paid employment declined slightly from around 15 to 12 per cent, remaining broadly comparable with the 13 percent figure reported by Philip Foster in the 1960s (Foster 1965a), although there has been a notable shift away from higher paying public sector to lower paying private sector employment. The proportion in self-employment other than farming also declined slightly from around 25 to 22 per cent. Farm work was undertaken as a main job by a slightly smaller percentage of adult household members in GLSS 5 than in GLSS 3, but continued to involve around two-fifths of all adults. Unpaid work increased somewhat but continues to employ very few adults, while the proportion of adults reporting that they undertook no work rose from around 17 percent to almost 28 percent. These figures are reported in Table 4.18. Table 4.19 shows the mean number of hours per week and weeks per year worked by adults according to their highest qualification for the pooled GLSS sample. A weak pattern of increasing work by qualification is apparent. It is notable that that those with no qualifications worked more hours and weeks than those with primary education and those with post-basic education typically worked the most hours per week and most weeks per year.

**Table 4.18: Types of work undertaken as a 'main job' by adult household members (aged 18-60) %**

| Work type | Survey round | | |
|---|---|---|---|
| | GLSS 3 | GLSS 4 | GLSS 5 |
| **No work** | 16.82 | 19.96 | 27.83 |
| **Paid employment** | 14.99 | 12.02 | 12.12 |
| **Self employment** | 24.58 | 25.35 | 17.99 |
| **Farm work** | 42.01 | 39.54 | 39.38 |
| **Unpaid work** | 1.60 | 3.12 | 2.68 |
| **Total** | 100.00 | 100.00 | 100.00 |

Source: Computed from GLSS 3-5

Table 4.20 reports the mean hourly earnings of household heads according to their occupational grouping and by survey round. Public sector employees received the highest hourly earnings in all survey rounds, and these increased over the period as a whole, although they were highest in GLSS 4. The lowest hourly earnings were in food farming and informal work although these also increased over the period, more markedly in informal work. Export farmers' hourly earnings increased notably, as did those in non-agricultural self-employment while private sector employee' earnings increased more modestly. Export farming includes a significant proportion of cocoa

farmers whose incomes rose considerably over the period partly because of an increased world price for cocoa and because of decreased production in the Cote D'Ivoire. Table 4.21 shows the mean hourly earnings of all adult household members by main type of work. Farm earnings declined slightly over the period in real terms while earnings from paid employment increased a little. Self-employment earnings increased markedly, especially during the second half of the period.

**Table 4.19: Mean hours and weeks worked by highest educational qualification**

| Qualification | Mean hours | Mean weeks |
|---|---|---|
| None | 23.7 | 28.5 |
| Primary | 18.0 | 21.4 |
| Middle school | 29.8 | 31.6 |
| Voc/com | 34.0 | 32.9 |
| O level | 40.1 | 40.3 |
| A level | 43.4 | 37.2 |
| Teacher training (B) | 30.1 | 39.9 |
| Technical/professional | 34.9 | 36.2 |
| Bachelor's | 36.3 | 37.8 |
| Master's | 36.7 | 41.4 |
| Doctorate | 42.3 | 51.4 |

Source: Computed from GLSS 5

**Table 4.20: Mean hourly earnings of household heads according to occupational group (GLSS 3-5) (1999 Cedis)**

| Occupational group | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|
| Public sector employee | 2832.9 | 5262.8 | 3379.9 |
| Private sector employee | 1465.9 | 1967.9 | 1727.4 |
| Private sector informal | 813.3 | 790.4 | 1597.9 |
| Self-employed (agriculture – export) | 1070.5 | 1211.6 | 2379.3 |
| Self-employed (agriculture – food) | 763.4 | 616.7 | 914.1 |
| Self-employed (non-agriculture) | 1324.3 | 1349.7 | 2170.5 |
| Total | 1267.8 | 1460.2 | 1643.9 |
| Observations | 4089 | 5253 | 7132 |

Source: Computed from GLSS 3-5

**Table 4.21: Mean hourly earnings of all adult household members by type of work (1999 Cedis)**

| Work type | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|
| Paid employment | 2079.7 | 2570.4 | 2136.5 |
| Self employment | 1118.4 | 1190.2 | 2045.4 |
| Farming | 743.2 | 631.9 | 667.3 |
| Total | 1179.5 | 1204.4 | 1237.1 |

Source: Computed from GLSS 3-5

Table 4.22 shows the proportions of household heads engaged in each type of work. Lucrative public sector employment declined substantially from employing around 13 to 8 per cent of household heads while private sector formal employment increased. Informal work increased markedly in terms of the proportion of household heads it engaged. Other types of work continued to employ similar proportions of household heads.

When earnings are examined by highest level of educational attainment, they are found to rise notably with education as shown in Table 4.23. By GLSS 5 mean hourly earnings for those with tertiary education are more than eight times higher than for those who have never attended school. In GLSS 3 they are found to be four times higher. Over the period, there typically a small increase in mean hourly earnings for most levels of schooling with the notable exception of tertiary education whose graduates earned twice as much in 2005/6 than in 1991/2. Primary school graduates' earnings improved, by around one fifth, although their earnings are found to be below those of primary school non-completers. Those with upper secondary education earned approximately twice as much on average as those who had never attended school. These figures show that post-primary education is strongly associated with economic advantage in Ghana with some evidence of a strengthening association.

**Table 4.22: Household heads' employment by occupational group and survey round (GLSS 3-5)**

| Occupational group | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|
| Public sector employee | 12.98 | 9.39 | 7.13 |
| Private sector employee | 4.53 | 5.86 | 8.29 |
| Private sector informal | 3.92 | 3.75 | 8.13 |
| Self-employed (agriculture – export) | 5.55 | 6.38 | 6.75 |
| Self-employed (agriculture – food) | 41.50 | 36.51 | 37.08 |
| Self-employed (non-agriculture) | 27.56 | 33.79 | 26.66 |
| Total | 100.00 | 100.00 | 100.00 |

Source: Computed from GLSS 3-5

**Table 4.23: Mean hourly earnings for adult household members by highest level of education**

| Highest schooling level | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|
| Never attended | 827.3 | 625.6 | 838.1 |
| Less than completed primary | 1054.7 | 901.8 | 1175.2 |
| Primary | 853.6 | 772.3 | 1059.7 |
| Lower secondary | 1132.8 | 1735.0 | 1186.1 |
| Upper secondary | 1690.3 | 1557.8 | 1608.5 |
| Tertiary | 3322.9 | 6947.7 | 6924.6 |
| Total | 1178.9 | 1204.8 | 1236.6 |

Source: GLSS 3-5

## 4.8 Summary

Education levels in the adult population improved gradually over the period 1991-2006 as did participation in schooling by children. The gap between the more advantaged Southern regions and the North narrowed with regard to children's participation in schooling and public spending on primary education is found to be pro-poor and increasingly so over the period. At secondary level and above, however, public spending is pro-rich and increasingly so. Policies aimed at cost-reduction in basic education are associated with improved primary enrolment since 1991, most notably the FCUBE and Capitation Grant policies, although on average spending on education increased markedly. Completion rates do not show comparable improvement and over-age enrolment appears not to have improved at least for older pupils although these would typically have initially enrolled prior to the implementation of these policies. Differences in school quality indicators typically favour southern districts in Ghana but showed some limited improvement over the period. The proportion of children involved in work declined as did the average size of households, except among the extremely poor. Household welfare increased between 1991 and 2006 for non-poor households. The number of households in poverty declined substantially, however, the gap between poor and non-poor welfare levels increased and inequality between welfare quintiles also widened substantially owing to redistributive effects favouring these groups. Growth was nonetheless substantial. Poor households depend considerably on agricultural incomes. Employment in wage labour, the most lucrative source of income, declined in proportionate terms and is associated strongly with more educated workers. These workers are also found to work more hours. Hourly wages increased markedly for workers educated to tertiary level, but not for other groups.

# CHAPTER FIVE

# MODELLING EDUCATION AND POVERTY RELATIONSHIPS

This chapter reports the findings of modelling the determination of living standards in terms of per capita household welfare and poverty in Ghana over the period from 1991 to 2006, with a focus on the role of education. It also reports the results of modelling of the effects of education on occupational selection and on household income from various sources; alongside modelling of the determination of schooling access and progression outcomes. Research sub-questions three to seven are addressed. Tables prefixed with A are included in Appendix A.

## 5.1 Household Welfare, Poverty and Education in Ghana 1991-2006

Table A5.1 reports the correlations between household heads' years of schooling and real per capita household welfare, first for pooled GLSS 3-5 data with controls for survey rounds and then separately for each of the three surveys. Strong associations are found, which appear to be increasing over time. Better educated households (using the household head's education a proxy for household education levels) enjoy considerably higher living standards in terms of welfare, with an additional year of education being associated with an approximate three per cent increase in welfare for the period 1991-2006 as a whole. A quadratic term is included to reflect a possible curvilinear effect of education on the log of welfare. A positive correlation is found, indicating that the additional welfare associated with successive years of schooling increases at higher levels of schooling. The co-efficients for the two survey round dummies show that welfare increased by around thirteen per cent between each of the survey rounds, controlling for changes in levels of schooling only.

Table A5.2 reports the correlations between the household head's highest level of educational achievement (qualifications) and welfare. The pattern is consistent with the

findings in Table A5.1 in that the correlations are found to be increasing over time, in some cases rising dramatically. By GLSS 5, households whose heads held a bachelor's degree were associated with welfare levels more than three times greater than households whose heads had no education, who are the reference group (an increase in the log of welfare of 146%). The association between welfare and lower levels of education along with some professional qualifications increased between two and three fold in the period between 1991 and 2006.

Clearly these associations cannot be interpreted causally, but they do present strong evidence for the proposition that better educated households in Ghana enjoy substantially higher (and increasing) living standards. Definitions of key variables employed in this chapter are given in Table 5.3 below and descriptive statistics are provided in Table A5.4. Owing to endogeneity concerns in general regarding the determination of welfare as discussed in Chapters 2 and 3, indicative trends may be considered more reliable than exact estimate magnitudes.

*Education and Poverty*

With respect to the specific issue of poverty outcomes in relation to potential causal effects of education, the results shown in Table A5.5 provide more detailed evidence. Three poverty outcomes (extremely poor, poor and non-poor) are modelled using an ordered probit model for the pooled sample. Controls are introduced for household composition factors and asset levels along with controls for effects of region and urban/rural location (the control variables included are not reported in A5.5 but are the same as those reported in Table A5.7). The approach treats the poverty outcomes as selections from a latent continuous variable and marginal effects are calculated to estimate effects on the probability that a household is selected into each of the categories of each explanatory variable evaluated at its mean.

Results show that in the presence of controls, there is evidence that education plays a potentially important role in determining poverty outcomes, with higher levels of qualification being found mostly to have larger effects, some of which increased over time. Both 'cut-points' are statistically significant at the five percent level in GLSS 3

and 4 indicating that there are three distinct poverty outcomes explained by the model. In GLSS 5, however, only the first cut point is significant indicating that in this survey

**Table 5.3: Description of key explanatory variables**

| | |
|---|---|
| Age in years | Child's age in years |
| Age squared/1000 | Square of child's age divided by 1000 |
| Sex | Dummy variable for child's gender (female is reference category) |
| Relationship to the household head | Set of dummy variables for child's relationship to the household head – son/daughter is the reference category |
| Child's work | Set of dummy variables for main category of child's work – not working is the reference category |
| Household Characteristics | |
| Log of household size | Log of the household size (in equivalent adults on calorific needs scale) |
| % girls aged 7 to 14 | Proportion of household members who are girls in the age range 7-14 |
| % under 7 | Proportion of household members who are boys aged under 7 |
| % over 59 | Proportion of household members who are aged over 59 |
| Sex – Head of HH | Dummy variable for the gender of the household head - female is the reference category |
| Age – Head of HH | Age in years of household head |
| Age squared/1000 (HHH) | Square of household head's age divided by 1000 |
| Occupational group of the household head | Set of dummy variables for the occupation of the household head (not working is the reference category) |
| Log of household welfare | Log of annual household consumption expenditure in the child's household corrected for household size and relative prices by region/survey round |
| Contextual Characteristics | |
| Survey round | Dummy variable for GLSS4 and GLSS 5 - GLSS 3 is the reference category |
| Urban | Dummy variable for urban/rural location - rural is the reference category |
| Region | Set of dummy variables for the child's region of residence - Upper West region is the reference category |
| Urban | Dummy variable for urban/rural location - rural is the reference category |
| School travel time | Mean time spent travelling to school by those currently attending at the cluster level (hours) |

Source: Variables computed/extracted from GLSS 3-5

round the extremely poor outcome is distinct in terms of its determination from the poor and non-poor groups taken together. Marginal effects are reported in Table A5.6 for the pooled sample. These show that educational attainment of the household head reduces the probability of a household being extremely poor or poor and increases the probability of a household being in the non-poor category. In respect of lower levels of

attainment, the probability of being extremely poor is reduced by between 2 and 8 percentage points, and for qualifications at A-level or higher the probability is reduced by 10 to 12 points. It is notable that in relation to extreme poverty, contextual effects are large, so that living in the Ashanti region, for example, reduces the probability of being extremely poor by 16 percentage points and living in an urban area by 13 points. Households in GLSS 4 and 5 were less likely to be extremely poor by around 5 percentage points than those in GLSS 3. The probability of being poor was found to be affected similarly but with slightly smaller marginal effects for education and region. Urban and survey round effects were notably smaller at around half of the effects for extreme poverty. In respect of the non-poor category, education levels were found to increase the probability of a household being in this category by between 3 and 15 percentage points for lower levels of education and by up to 25 points for higher levels. These effects may be considered indicative of potential positive effects of education in potentially 'lifting' households out of poverty and into the non-poor category. Regional effects increased the probability of not being poor by up to 27 percentage points, urban location by 20 points and the two later survey rounds by 7 to 8 points.

*Education and Welfare*

Tables A5.7 and A5.8 report the results of ordinary least squares (OLS) regressions for the pooled survey sample and for each survey round separately, with the log of household welfare as the outcome and with the same explanatory variables as the ordered probit. This is intended to model the determination of the full range of welfare outcomes, not only poverty status. The full set of controls used in all the regression exercises is reported in Table A5.7, which reports results using the household head's years of schooling as the education variable. Table A5.8 reports the results using the head's highest educational achievement. Across all survey rounds, the household head's years of schooling is found to have a negative linear effect and a positive quadratic effect on welfare, so that the marginal and average effects of education on welfare increase with the number of years of schooling. The total effect is negative up to two years of schooling, rising to an average effect per year of education of 1 per cent beyond 5 years and 2 per cent beyond 10 years. For the individual surveys, the negative linear effects are not significant, but the household head's education is found to

have a fairly consistent positive quadratic effect, which appears to rise between GLSS 4 and 5, again indicating a pattern of rising welfare benefits for successive years of schooling, which are possibly rising over time. Regional and urban effects are found to be large and mostly increasing in the case of regional effects over the period as a whole. Household composition effects indicate that households with a greater proportion of children, especially those under age 7 enjoyed lower per capita welfare. The proportion of male adults in the household was also found to reduce welfare slightly. Larger households (in terms of the number of equivalent adults using a calorific scale) enjoyed considerably lower welfare, with one additional equivalent adult being found to have the effect of reducing per capita welfare by 10 to 12 per cent. Households with male heads (around two-thirds of households) enjoyed lower welfare in GLSS 5, possibly in part because female headed households receive remittances from males working away from home (see 5.2). Land ownership and ownership of large animals was found to positively affect welfare as was the status of the household head as a migrant, defined in terms of being resident in a region different from the region of birth. In the presence of these controls, welfare was found to have increased by 13 per cent between GLSS3 and 4 and by 18 per cent between GLSS 3 and 5.

Examining the effects of individual qualifications in Table A5.8, results show a number of increasing effects over time. At lower levels of achievement, the effects of some education and primary schooling (as opposed to the reference category of never having attended school) were not significant in GLSS 3, but by GLSS 5 were significant at the one per cent level with effect sizes of 10 and 15 per cent. At higher levels, university and professional qualification effects increased, in some cases steeply. The marginal effects of successive levels of education beyond the basic phase are found to be typically increasing, so that in the pooled sample, a year of primary education is found on average to increase welfare by around two percent (6 years equates to 11.7%), while a year of a four year bachelor's degree, assuming earlier education to A level, is found to increase welfare by around eight percent.

Tables A5.9 to A5.12 present the results of quantile regressions using the household head's years of schooling as the education variable. They report co-efficients estimated at the $20^{th}$, $40^{th}$, $60^{th}$ and $80^{th}$ percentiles of the distribution of the log of household

welfare and allow comparison of effects among these welfare groups, particularly for the purpose of comparing educational effects. Table A5.9 reports the pooled survey results, Table A5.10 GLSS 3 results, Table A5.11 GLSS 4 results and Table A5.12 GLSS 5 results. There is little evidence for differences in the welfare benefits of education in terms of years of schooling among the four welfare groups and results are similar to those for the whole sample reported in Table A5.7. Overall, the effect an additional year of education on welfare in Ghana may thus be considered broadly similar across the distribution of welfare. Positive effects of region when compared to the reference category (Upper East, a relatively poor region in Ghana) are, however, found to be larger for the lower welfare quantiles, except in the cases of the Northern and Upper West regions where effects are generally smaller, indicating that lower welfare groups benefit less (or lose more) from living in the poorer Northern regions and benefit more from living in the more affluent Southern areas, indicating an important difference between contextual effects by quantile. Also, the co-efficients for the GLSS 5 survey in the pooled quantile regression indicate that the highest welfare quantile increased its welfare by a larger proportion than the lowest over the period since GLSS 3 (17 compared to 13 per cent) net of the effects of the explanatory variables in the model, indicating rising welfare inequality.

*Within and between cluster effects*

Tables A5.13 and A5.14 report the effects of repeating the modelling exercises reported in Tables A5.7 and A5.8 using a 'cluster fixed effects' approach. The results reported are 'within cluster' effects since effects common to a cluster are removed. Clusters in the survey are censal enumeration areas, typically villages or around 200 households. This approach may be considered to remove endogeneity bias due to a correlation between cluster level factors including economic and labour market opportunity and education and welfare to produce a more accurate measure of the effect of household level welfare improvement through education. Concerning the effect of the household head's years of schooling, this approach reduces the co-efficient of the quadratic term in the pooled regression slightly when compared to the earlier OLS model and the negative co-efficient for (linear) years of schooling in GLSS 5 becomes significant. In common with earlier findings, however, the relationship is found to be convex.

The cluster fixed effects results for qualifications show fairly large reductions when compared to the earlier OLS model where lower levels of education are concerned indicating within region differences, with co-efficient sizes for 'some education' and primary schooling falling by half in GLSS 5. For higher qualifications, co-efficients are reduced typically by up to one third. Table 5.15 shows the marginal returns in consumption to a year of education at selected levels of academic qualification. The pattern is one of broadly increasing returns by level, but with particularly high marginal returns at A-level and at master's degree level (although samples at tertiary level are small).

The 'cluster fixed effects' approach removes the 'between cluster' effects of cluster mean levels of education on mean levels of welfare, which in the OLS approach in Table A5.8 are subsumed in the education effects. In order to explore these separately, Table A5.16 presents the results of a 'between-effects' model using years of schooling as the education variable. The approach is to model the determination of cluster-mean welfare using cluster-mean values of the explanatory variables. In terms of years of schooling, the results show that an increase of one year in the mean value of the quadratic term for the household heads' levels of education by cluster increases the cluster mean of the log of welfare by 0.6 per cent in the pooled sample, equivalent to a value of more than 6 per cent at 5 years of schooling. The effect appears to be falling slightly from 0.6 per cent in GLSS 3 to 0.4 per cent in GLSS 5, although it is not significant in GLSS 4. The proportion of migrants in a cluster along with the proportion of male household heads also have notable 'between cluster' effects (positive and negative respectively) on welfare in two of the survey rounds. While 'between cluster' effects are not attributable to individual households or household members, in the case of (ostensible) education effects, these represent the benefits of living in better educated clusters which may relate to cluster level factors correlated with mean education levels and/or the 'spillover' effects of cluster-level education itself. Nonetheless, individual households enjoy the benefits of these education or education-correlated effects.

**Table 5.15: Marginal Returns to a year's education by level of qualification**

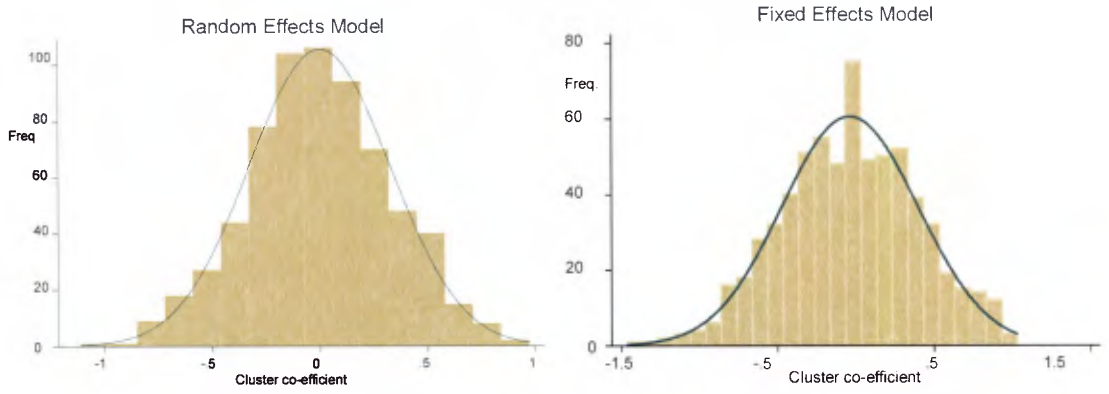
| | Pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Primary | 1.2 | 0.3 | 2.0 | 1.3 |
| Middle school cert | 3.3 | 4.8 | 2.0 | 3.4 |
| O level | 4.2 | 2.6 | 4.8 | 3.8 |
| A level | 11.3 | 16.2 | 7.7 | 12.2 |
| Bachelor degree | 4.7 | 1.3 | 0.9 | 7.4 |
| Master's degree | 13.2 | -1.5 | 27.6 | 14.5 |

Source: computed from Table 14

*Multi-level models*

In order to explore the importance of within and between cluster education effects in more detail, it is useful to employ a modelling strategy which allows them to be modelled simultaneously. A 'random effects' approach to clustered data allows the explicit modelling of cluster-level unobserved or latent effects ('random intercepts') alongside household level and contextual effects. However, as discussed in Chapter 3, an additional issue of endogeneity arises in that cluster-level effects (intercepts) are assumed in a random effects approach to be uncorrelated with explanatory variables. If this assumption is violated, the approach may produce biased estimates for the explanatory variables concerned. The Hausman specification test is employed to test this assumption. Table A5.17 presents the results of a Hausman test to compare the 'cluster fixed effects' approach whose results were reported in Table A5.13 with a random effects model including the same variables. The results show differences in the co-efficients of interest, indicating potential bias in the random effects estimates. The larger value in the 'random effects' model may be absorbing part of the effect of cluster-level education. The differences result in a p-value for the Hausman test which is significant at the 1 per cent level, indicating that bias in the random effects approach cannot be ruled out. Nonetheless, as Figure 5.1 below illustrates, both the fixed effects and random effects co-efficients for cluster effects are approximately normally distributed and that their distributions are similar, although the random effects are affected slightly by 'shrinkage' to the mean as discussed in Chapter 3.

**Figure 5.1: Comparison of fixed and random effects cluster co-efficients**




Source: GLSS 3-5 data

Following Rabe-Hesketh and Skrondal (2008), the random effects approach may be developed in relation to the endogeneity problem by including cluster-mean values for variables where cluster-level endogeneity may be an issue. Table A5.18 reports the results of the Hausman test comparing the fixed effects model and a random effects model which includes cluster mean values for all appropriate variables. The co-efficients are found to be much more similar to those in the fixed effects model and the test statistic is not significant except in GLSS 4. With respect to the co-efficients for education variables, differences in GLSS 4 are nonetheless extremely small so that the random effects approach may be considered reliable for the estimation of education effects.

Table A5.19 reports the results of a random intercepts (latent cluster effects) model containing the same explanatory variables as the cluster fixed-effects model but where the education variables at household level are transformed into deviations from the cluster mean and mean values are included separately. This approach allows the deviation values to be interpreted as within cluster (fixed) effects and the mean values to be interpreted as between cluster effects. The results show that the co-efficients for the deviation values are very close to the fixed effects values in Table A5.13. Cluster mean values are close to the 'between effects' in Table A5.16. When compared to the OLS model reported in Table A5.8, regional, urban/rural, and survey round effects are notably reduced, indicating that these effects in part capture between cluster effects. The rho co-efficient indicates the conditional intra-cluster correlation coefficient whose value denotes the extent of residual within cluster homogeneity in household welfare

levels in the model. Results show that between a third and two-fifths of unexplained variation remains at the cluster level, which may be considered high and indicative of considerable within cluster homogeneity consistent with large contextual effects. The 95% confidence interval for the range of cluster-level intercepts is 14.085+/- 1.96*0.326 in the pooled sample which gives a 9.5% increase in welfare due to this parameter between the $5^{th}$ and $95^{th}$ percentiles of cluster effects.

The random effects model may be augmented in a multi-level approach to include cluster-level explanatory variables and cross-level interactions between household-level and cluster level variables with the intention of explaining patterns of inter-cluster variation which the rho co-efficient indicates are noteworthy. It is useful to include cluster-level contextual variables whose counterparts at household level could not usefully be included owing to potential endogeneity due to correlation with both education and welfare. Since formal employment in Ghana is generally associated with higher welfare levels and higher returns to education (see 5.2), the availability of such employment is a key factor in determining cluster-level benefits from education. It may be that households in clusters with greater availability of formal employment enjoy greater welfare benefits overall and from their educations. While some household heads are obviously employed outside the cluster in which they live, the cluster-level formal employment variable reflects this by being constructed as the mean of household-level formal employment. Table A5.20 reports the results of a multi-level modelling exercise which includes a variable for the cluster proportion of household heads engaged in formal employment and an interaction between cluster level formal employment and household level education as well as an interaction between household and cluster-level schooling of the household head.

The coefficient on the formal employment variable is sizeable and significant at the 1 per cent level in the pooled data and in each survey round separately, indicating that the availability of formal employment is potentially an important determinant of household welfare in all survey rounds. A ten per cent increase in formal employment within a cluster is found to increase individual household welfare by 12 to 19 per cent on average. When this variable is included, the size of between-cluster education effects becomes non-significant in GLSS 3 and 4 and is reduced in GLSS5, indicating that the

cluster-level education effects at least partly subsumed formal employment effects in earlier models.

The interaction term for schooling and formal employment does not achieve statistical significance, however, so that there is no clear evidence for increased educational benefits in clusters with a greater availability of employment, although there is evidence that household welfare is higher across the range of education levels in these clusters. In GLSS5, and in the pooled sample, the cross-level interaction term between household and cluster education (quadratic of years of schooling) is significant. In GLSS 5, an additional year of schooling of the household head at 2 years of schooling in a cluster with a mean of 2 years increases welfare by an approximate additional 1.6 per cent and in a cluster a 3 year mean by 3.6 per cent. At ten years of schooling for the household head, an additional year of schooling in a cluster with a 2 year mean increases welfare by 6.7 per cent and in a cluster with a 3 year mean by 15.1 per cent. Better educated contexts are thus associated with higher welfare benefits of household level education indicating variation in cluster-level welfare benefits of schooling.

A final development of the model is also permitted in the multi-level framework in that coefficients on household-level explanatory variables may be modelled as 'random co-efficients' i.e. allowed to vary by cluster, useful to explore this last point. Table A5.21 reports the results of a multi-level model with random co-efficients for the quadratic term for the household head's years of education. While the between-cluster, within-cluster mean and cross-level interaction education effects remain similar, the model also estimates standard deviations for the random co-efficients, indicating the range of variation in household level education effects by cluster. The standard deviation of the random co-efficient for the quadratic years of schooling term is around 0.0007 in the pooled sample and across the individual survey rounds. In the case of the pooled sample, the 95 per cent confidence interval for the co-efficient (slope) on the quadratic term is the range 0.0015 +/- 1.96*0.00067 i.e. 0.0002 to 0.003, indicating that at cluster-level, the effect of an additional year of education on welfare at the 5 year level is between 0.5 and 7.5 per cent and at the 10 year level is between 2 and 30 per cent, depending on the cluster. These results indicate a wide level of variation between clusters in terms of the welfare benefits of schooling even when controlling for the

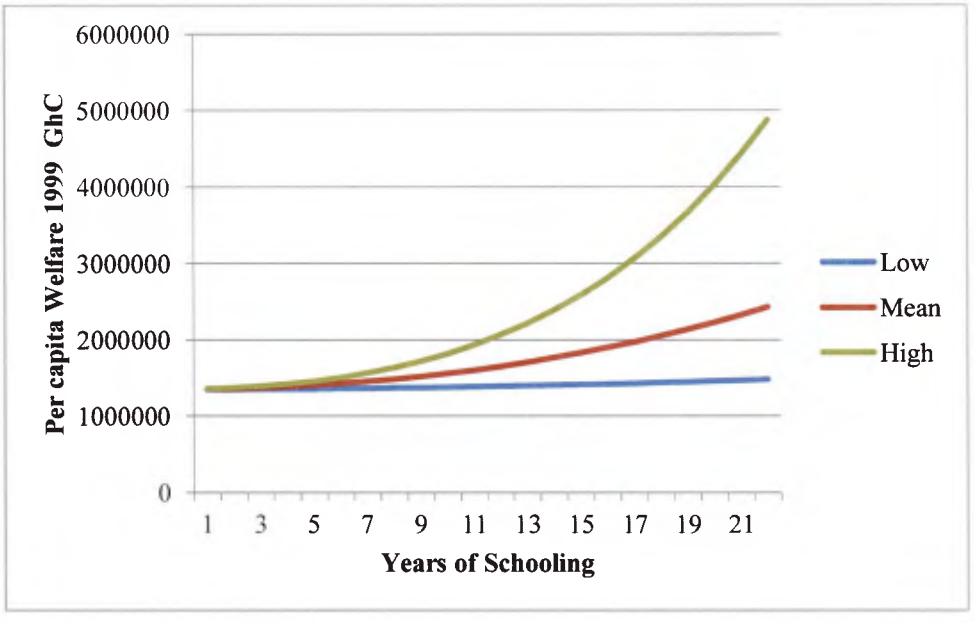
effect of the interaction between household and cluster levels of schooling on welfare and for the availability of formal employment. Figure 5.2 illustrates this variation by plotting predicted values for household welfare against the household head's level of schooling, using a reference value for household per capita welfare of 1.29 million 1999 Ghana Cedis at Accra prices, the mean value in the pooled sample for a household whose head has no education. The blue line represents a cluster at the upper bound of the 95 per cent confidence interval for the slope on the household head's years of education squared. The red line represents a cluster at the lower bound of the confidence interval. The green line represents the mean value, which also depicts the relationship identified in the cluster fixed effects model i.e. the mean within cluster effect. The figure suggests that relatively little welfare benefit is derived from 4 or fewer years of education for the household head in all clusters, but for clusters with at least a mean effect, benefits rise at an increasing rate, particularly where the household head has more than 9 years of education. For clusters with the smallest effects, all levels of schooling have relatively little effect on household welfare. The values for cluster-level random co-efficients on the quadratic term for household head's years of schooling in the pooled sample, estimated using the 'empirical Bayes' method (see Rabe-Hesketh and Skrondal 2008) are shown in Figure 5.3 and are approximately normally distributed. These are cluster-specific deviations from the mean effect of 0.0015 and show that variation in cluster effects is sizeable. Figure 5.4 plots the predicted cluster-level relationships between schooling and welfare by cluster in GLSS 5. While the dominant pattern is one of a positive relationship, it is apparent that the overall relationship between schooling and welfare conceals considerable variation at cluster-level and some clusters are found to have negative relationships. Figure 5.4 also illustrates the wide variation in cluster-intercepts.

When district-level quality indicators for 2004/5 taken from EMIS were included in this model at cluster-level, while other estimates remained stable, the cluster mean of years of schooling became insignificant and two quality variables were found to have small but significant effects. The district PTR at primary level had a coefficient of -0.009 (significant at the 1% level) which equates to an increase of household welfare of 9% for a reduction in the PTR of 10 pupils per teacher. The district BECE pass rate in maths had a coefficient of 0.003 (significant at the 10% level) indicating that a 10%

increase in the pass rate is associated with a 3% increase in household welfare. The explanatory power of the model was improved slightly. These findings suggest that the cluster mean schooling level is correlated with educational quality in the district and that better quality education is weakly associated with higher welfare.

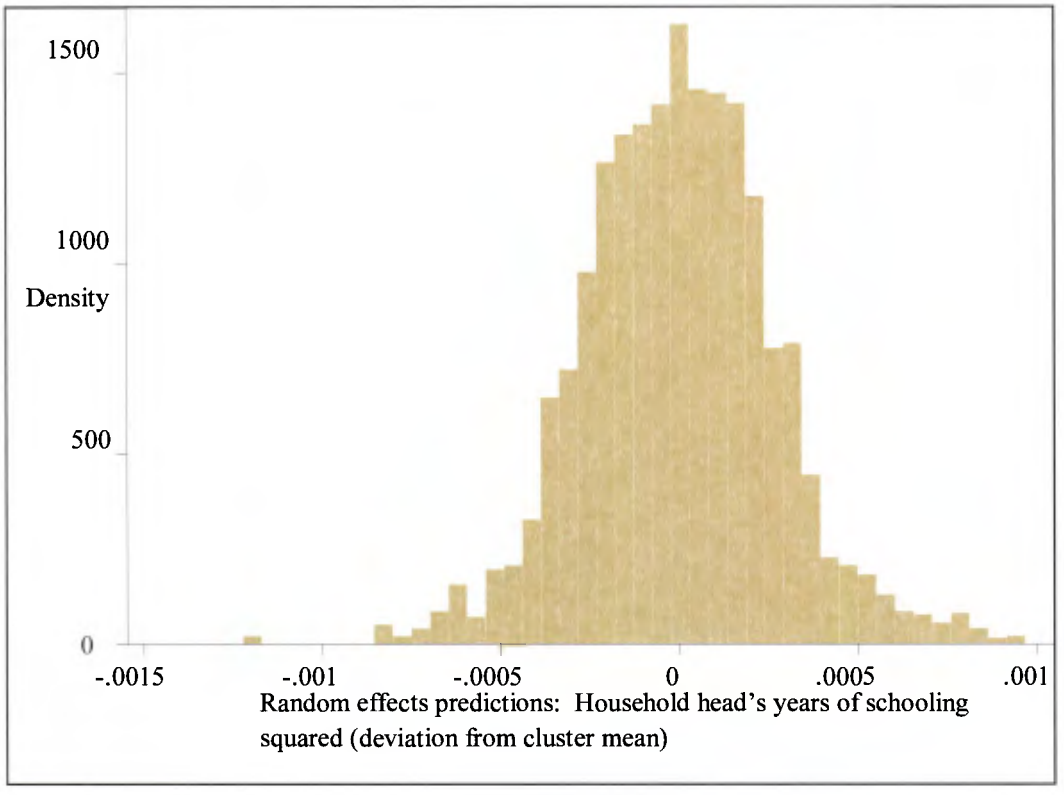
Figure 5.5 shows the relationships between the estimated random intercept and slope parameters for each survey round and illustrates an increasingly negative relationship over time suggesting that in GLSS 5 at least, higher cluster-level co-efficients for the effect of education on welfare are associated with lower impacts of unobserved cluster-level factors which affect mean levels of education and welfare. This is not to suggest that that the benefits of education on welfare are higher in areas where educated workers are scarcer or where opportunities for wage employment are fewer, since the estimated parameters are net of these factors. It might however indicate that that higher impacts of some cluster level unobserved factors which could include infrastructure, types of crops cultivated and so on are associated with lower consumption returns to education although this could not be investigated further.

**Figure 5.2: Education effects on welfare: Random co-efficients model**



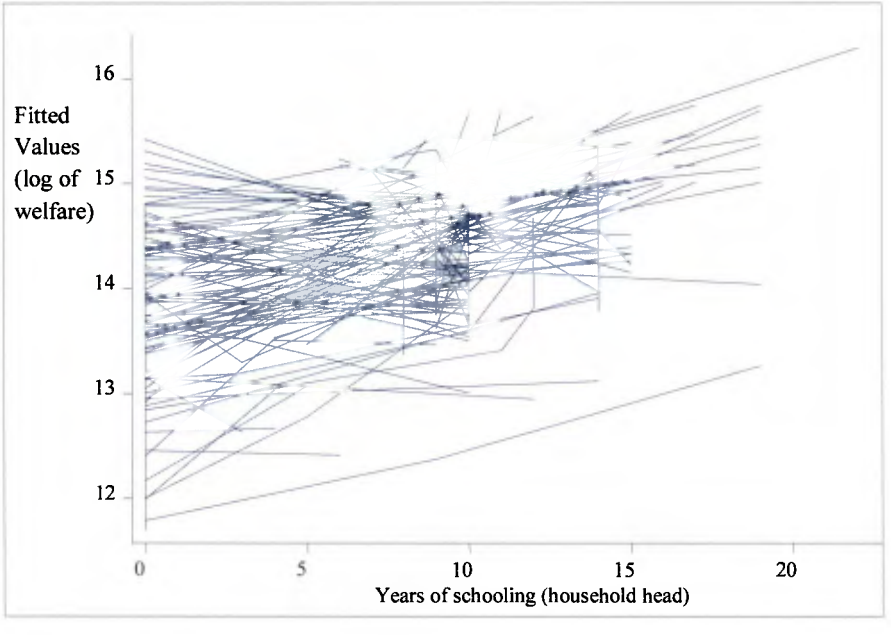

Source: computed from model results (Table 20)

**Figure 5.3: Cluster-level random co-efficient predictions: household head's education (quadratic effect)**



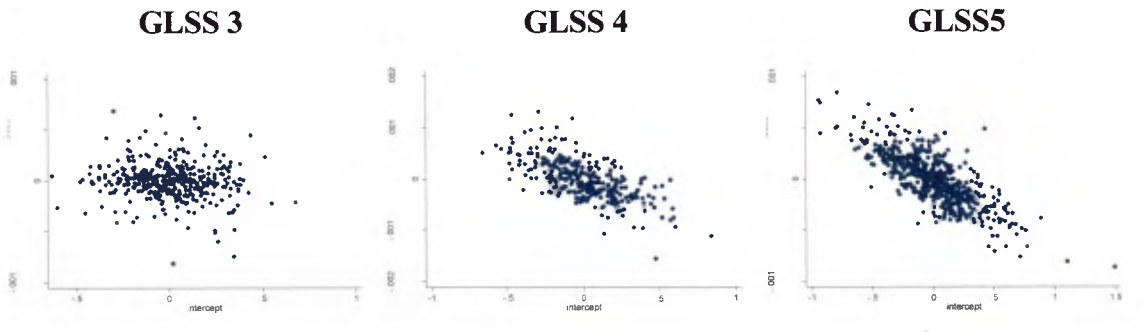

Source: computed from model results (Table 20)

**Figure 5.4: Predicted within cluster relationships between household head's education and welfare (GLSS 5)**




Source: Computed from model results (Table 20)

**Figure 5.5: Relationships between predicted random intercept and slope parameters**




Source: Computed from model results (Table A5.20)

## 5.2 Returns to Sources of Income

While per capita consumption measures are most often the best indicators of poverty defined in terms of the satisfaction of nutrition-related requirements, it is instructive to consider in more detail the income-determinants of consumption when examining the effects of education on consumptions levels, since the benefits of education on consumption operate through the benefits of various sources of income, and the ways in which these are combined and shared. Per capita (equivalent adult) consumption levels are a function of total consumption by a household and the number of equivalent adults in a household; and total consumption is in turn a function of the household's total income. Consumption may be considered as 'smoothed' income over the longer term (see discussion of the Permanent Income Hypothesis in Chapter 2). The GLSS contain data on the individual and household income sources which contribute to consumption expenditure. Individual level earnings in wage employment are collected alongside household earnings in agriculture and self-employment, household income from remittances and rents and 'other household income'. The pattern of consumption returns described in the previous section indicates a typically convex relationship between the household head's years of schooling and per capita consumption so that the marginal return to a year of schooling increases with the number of school years, especially at higher levels of qualification. Examination of the determination of incomes serves to investigate this further in terms of the returns to education from the sources of income that generate consumption.

*Wage employment*

Table A5.22 shows the relationship between the level of education/qualification achieved and (log) hourly earnings in employment for adult household members over the age of 14 who were employed at the time of the surveys using OLS owing to limited variation within cluster on qualifications levels. Male wages are found to be higher ceteris paribus and there are significant positive experience effects (proxied by age), although these are diminishing at higher levels of experience, shown by the negative quadratic term for age. Positive effects of education are significant at the primary level only in GLSS 3. Effects rise fairly consistently by level post-primary with a 29.2 per cent premium on log earnings being associated with middle-school education compared to no schooling in the pooled sample, rising to 233 per cent for a doctorate. Marginal returns in wage terms to a year's education at selected qualification levels are shown in Table 5.23 below. In the pooled sample, marginal returns are clearly increasing substantially by education level. In GLSS 3, returns to a year of higher education were relatively low, but become large by GLSS 4 and remain so in GLSS 5. Marginal returns to primary and middle school education are found to be falling over time.

Table A5.24 (columns 1-8) shows the effects of years of schooling on earnings in employment using cluster fixed effects in order to address issues of endogeneity bias associated with correlation between education and wage levels within clusters due to clustering of educational and employment opportunity. Columns 1-4 show use a linear term for years of schooling only, while columns 5-8 include a quadratic term. Columns 9-12 report the results with a linear term only using household fixed effects. This last model relies on within household variation which is limited in that relatively few households comprised more than one wage earner. The approach may nonetheless be considered to address further endogeneity issues associated with bias due to ability and background factors common to the household. Using cluster fixed effects with the linear term only, a consistent and significant effect of between 7 and 8 percent for a year of schooling is estimated across all survey rounds. When the quadratic term is included, this term only is significant in the pooled sample and in GLSS 4, the linear term only in GLSS 3 and both the linear and quadratic in GLSS 5. The combined effect in GLSS 4 gives a (marginal) return to a year of schooling at 10 years (the end of basic education) of 5% and at 20 years (for example Master's degree) of 10%. In GLSS 5 the figures are

4.8% and 12%. This indicates an increasingly convex relationship over time; the effect being a constant linear 5.2% in GLSS 3. The estimates are consistent with those in Table 5.23 which show rising returns to higher qualifications over time. The household fixed effects model finds a significant effect only in the pooled sample, estimated at a 5.8 percent increase in wages per year of schooling. Table 5.25 below reports the results of estimation of wages returns for each region using OLS alongside the proportions of household heads in wage employment. It shows notably high wage returns in the disadvantaged Upper West and Upper East regions in particular, where wage employment is particularly scarce, but also in the relatively advantaged Greater Accra and Brong Ahafo regions.

**Table 5.23: Marginal wage returns to a year's education by level of qualification**

| | **Pooled** | **GLSS 3** | **GLSS 4** | **GLSS 5** |
|---|---|---|---|---|
| Primary | 2.1 | 4.5 | 2.7 | 0.3 |
| Middle school cert | 5.6 | 7.6 | 6.7 | 3.4 |
| O level | 10.8 | 11.4 | 6.0 | 15.4 |
| A level | 15.9 | 15.9 | 24.6 | 4.4 |
| Bachelor degree | 15.4 | 4.4 | 18.0 | 20.6 |
| Master's degree | 17.0 | 3.4 | 34.3 | 19.6 |

Source: computed from Table 23

**Table 5.25: Estimated wage returns by region (GLSS5)**

| **Region** | **Wage return %** | **% aged 15+ in wage employment** |
|---|---|---|
| Western | 5.5*** | 13.8 |
| Central | 5.7*** | 12.7 |
| Greater Accra | 10.2*** | 26.4 |
| Volta | 5.7** | 7.0 |
| Eastern | 7.2*** | 10.1 |
| Ashanti | 7.0*** | 12.1 |
| Brong Ahafo | 10.8*** | 8.7 |
| Northern | 5.7** | 4.3 |
| Upper East | 10.6*** | 2.1 |
| Upper West | 10.8*** | 3.4 |

*** p<0.01, ** p<0.05, * p<0.1

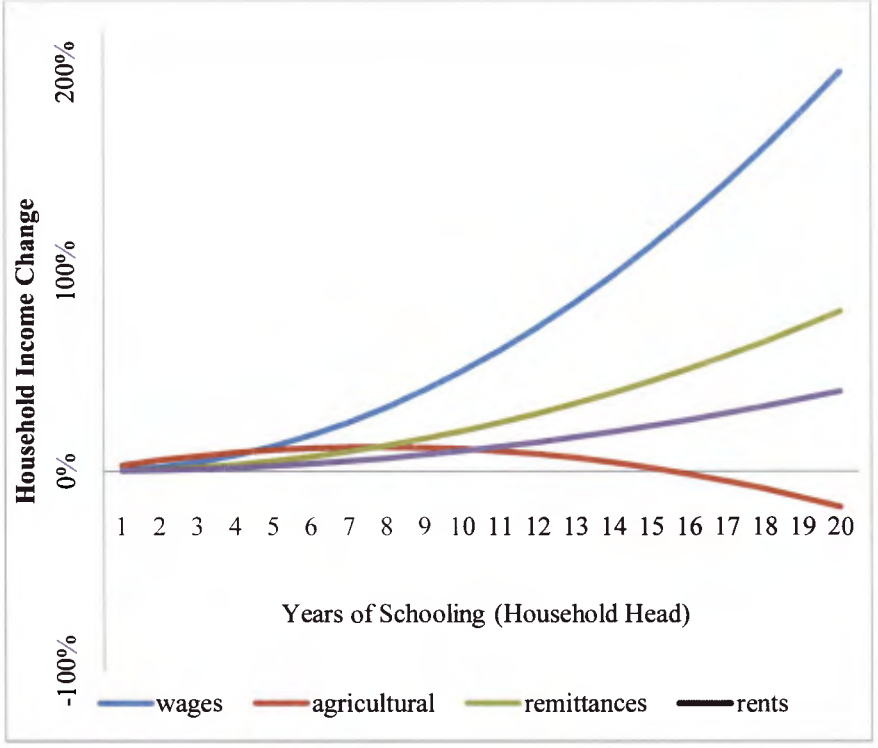
*Other Income Sources*

Table A5.26 shows the results of estimation using cluster fixed effects of the partial correlations in the pooled sample between the household head's education and total household incomes from six sources at the household level – wage employment, agriculture, non-farm self-employment, remittances, rents and other incomes. The associations may not be interpreted strictly as returns or indeed causally, especially because education levels are associated with particular income sources for the reason that better educated households for example devote less time to farm work and are more likely to contain more wage employees. An additional year of schooling of the household head is associated with an increase all wage incomes to the household in a convex relationship, being associated with a 5% increase at 10 years of schooling, as in the case of the individual-level relationship. In agriculture, the relationship is found to be concave, with agricultural incomes rising by 2% per additional year of schooling at 5 years, falling to almost zero percent at 15 years of schooling. No significant relationship is found in relation to non-farm self-employment or other income while in the cases of remittances and rents a relatively weak convex relationship is found, so that at ten years of schooling, a year of schooling of the household head is associated with a 2% rise in incomes from remittances and a 1% rise in incomes from rents (including imputed rents). Female headed households were found to be associated with higher levels of remittances. Figure 5.6 below illustrates the pattern of changing income benefits in each income source (within clusters) associated with increases in the household head's education, when compared to a household head with no education; which of course comprise effects of changing returns and changes in occupational selection with education; which are also inter-related. It shows that the relationship between education and incomes from wages is considerably stronger than the relationship with other income sources.

When associations between the household head's education and incomes in agriculture and in non-farm self-employment were examined only for households where the household head was employed in those occupations, results were mostly relatively modest. In the pooled sample and in GLSS 4, households where the household head was a farmer were found to have a significant linear association with the household

heads years of schooling in the presence of controls of between 1 and 2 percent. In non-farm self-employment a significant linear 'effect' was found in GLSS 4 and 5 of between 3 and 4 percent.

**Figure 5.6: Associations with household head's education and household income sources**




Source: Computed from results in Table A5.26

*Employment selection*

The issue of the selection of household heads into different occupational groups according to educational level is examined in more detail using a multinomial model with the pooled sample, reporting results in the form of 'relative risk ratios' in Table A5.27. The reference category is food farmers, typically the poorest occupational group. Regional and contextual effects are found to be large, with urban areas being associated with selection into waged work, informal employment and non-farm self-employment. Compared with the reference category of the Upper West region, more developed regions such as Greater Accra are also associated with these forms of work, especially private sector employment, somewhat unsurprisingly. With regard to the survey round variables, GLSS 3 and 4 are associated with notably lower selection into public sector

employment and GLSS 5 with a smaller increase in private sector employment, consistent with retrenchment in the sector. Education effects on selection are large in relation to waged work. Compared to household heads with no schooling, those with primary education were twice as likely to be in public sector employment than in food faming, those with a Senior Secondary School Certificate 19 times more likely, rising to 278 times more likely for those with Master's degree (although numbers are very small in higher education). Figures were smaller with regard to private sector formal employment, but remained large, with, for example, Bachelor's degree holders being 29 times more likely than those with no education to be in this kind of employment compared to food farming and O level holders being 10 times more likely. More educated household heads were also found to be more likely to work in non-farm self-employment or informal employment, especially where they held vocational qualifications. These effects were typically smaller, however, when compared to effects on formal employment.

Selection into formal employment over time is explored using a binary logistic model comparing selection into wage employment (public and private sector) to any other occupation for each of the survey rounds and for the pooled sample using cluster fixed effects to account for differences in local-level opportunity. Results are reported in Table A5.28. Selection effects of lower levels of education are significant only in GLSS 3 and the effects of intermediate level qualifications are found to be declining over the period. The effects of higher levels of qualification are found to be rising, however. For example in GLSS 3 a household head with O levels was almost 8 times more likely than an uneducated head to be in formal employment as opposed to other occupations, but only 4 times more likely in GLSS 5 while a bachelor's degree holder was 10 times more likely in GLSS 3 and 24 times more likely by GLSS 5.

*Household welfare, occupation and region*

Having explored the factors associated with selection into occupational groups, it is useful to explore the range of consumption benefits derived from education for the full range of occupational categories of the household head. Results are reported in Table A5.29. Using a linear term for years of schooling, households in which the head was in

formal employment increased their welfare in the pooled sample by 3.5-4.0% per year of schooling, with public sector employment associated with slightly higher benefit. Education was found to be almost as beneficial in households where the head was employed in informal employment or non-farm self-employment. Benefits were found to be lowest in households whose heads were farmers, with effects ranging from 1.5-1.7% per year of schooling, being slightly higher for export famers. Increases in welfare over time were particularly low for food farmers at around 8% between 1991 and 2006 compared to 34% for public sector workers. Regional and urban/rural effects are found to be large within each occupational group except private sector and informal employment. Notably, food farmers and non-farm self-employed workers in southern regions had considerably higher welfare than in the northern regions.

A further model examines the consumption benefits of education using a linear term only within regions, controlling for the household head's occupation. The results are reported in Table A5.30. Benefits are highest in Accra at a 3.7% increase in welfare per year of education of the household head, lowest in the Upper West region (where the effect is not significant) and low in the other northern regions plus in the Eastern and Volta regions. The highest benefits are typically in the more advantaged regions. Improvements in welfare within regions over the period were particularly low in the northern regions, being negative in the Upper West region. Rural areas in the north were also found to be more disadvantaged than rural areas in the south with the exception of Brong Ahafo which borders the Northern region. There were also differences in the effect of the household head's occupation within regions, controlling for education levels. The relative benefits of formal employment were typically highest in the north but the benefits of informal employment were also highest in the North. This suggests that within the northern regions, those few in these advantaged occupations increase their welfare relative to the majority of food farmers considerably. This is clearly partly because food farmers in the North enjoy notably lower welfare than in the South as shown in Table A5.29.

Finally, the partial correlations between education levels, region and occupation and the annual number of hours worked by household heads in the pooled sample (mean 1903 hours) are explored in Table A5.31. The results show that, controlling for occupations

and regions, the effect of schooling was very small. The effects of region and occupation are large, however. Working hours are notably lower in the three northern regions and higher among males. They are also much higher in formal and informal employment (especially in the private sector) and in non-farm self employment and lower in food farming and export farming (the reference group). Hours worked also increased notably between GLSS 4 and 5. The results indicate that part of the consumption benefits in more advantaged regions and occupations are likely to be due to longer working hours, while the figures are for household heads only.

### 5.3 Educational Access and Progression in Ghana 1991-2006

*Ever attendance at school*

Table A5.32 reports the results of estimation of the probability of a child in the 5-19 age-group ever having attended school, given certain key characteristics using a probit model. The results show that the effect of a child's gender is significant in both the pooled regression and in all of the separate survey-round regressions, with boys being more likely to have ever attended school. The gender effect declined substantially over the period, however, from a difference in probability of around nine percent to one percent. Older children were, unsurprisingly, more likely to have ever attended school, although the negative sign of the effect of the square of age indicates that the effect is curvilinear and diminishing. The overall effect of age on the probability of ever attending school declined between GLSS 3 and 5. Certain relationships of a child to the household head were found to exert a negative effect, including in the case of fostered children. Biological children of the household head are the reference category and compared to them, fostered children were less likely to have ever enrolled by 6 to 9 percentage points. The education of a child's parents, notably including Koranic schooling of fathers, was found to have significant effects on a child's ever-enrolment. These effects were typically diminishing over time, ranging from increasing the probability of ever-enrolment by 3 to 10 percentage points, depending on the level, in GLSS 3 to 3 to 8 points in GLSS 5. Parents' educations and occupational groupings are highly correlated so that in the presence of education variables, only formal

employment by household heads affected ever-enrolment significantly, increasing the probability of ever-attendance by up to five per cent in the earlier surveys.

Household welfare (consumption) levels were found to be positively associated with a child ever having attended school, with children in higher welfare households typically being more likely to have attended across the period. An increase in probability of ever-attendance of between 3 and 8 percentage points was found (except in GLSS 4) to be associated with an increase in welfare approximately equal to doubling its value at the mean (an increase of around 300 USD), which may be considered a relatively small effect which also no showed no strong trend. When the parent's educational and the household head's occupational characteristics were omitted these effects rise by around 2 percentage points. There was no consistently significant effect of household size, nor of key household composition variables.

Regional effects, however, were found to be significant and sizeable when almost every region, except the other northern regions when compared with the reference region of Upper East; where initial enrolment is typically lowest. The most positive regional effect overall was for the Brong Ahafo region whose children were up to 18 percentage points more likely to have ever enrolled (in GLSS 3). There appears to have been a general and substantial decrease in the size of regional effects over time, especially between GLSS 3 and 5. A significant effect was detected on the probability of ever-attendance between children residing in urban locations in the GLSS 4 and 5 data, with children being between 4 and 5 percentage points more likely to have ever enrolled than in rural areas. With controls in place for the effects of the full range of explanatory variables, dummy variables for the survey rounds GLSS 4 and 5 were found to have positive co-efficients, indicating a positive effect of unobserved factors associated with the time periods, possibly including policy interventions between these surveys and the reference point (the GLSS 3 survey). In the pooled regression, children in the GLSS 4 survey were 3 percentage points more likely to have ever attended school and those in GLSS 5 7 points more likely. When the cluster mean time spent travelling to school was included, a negative effect was found, equivalent to a decrease in the probability of ever-attendance by 2-4 percent per hour spent travelling. When other available supply-side indicators were included (possible for GLSS 5 only), their effects were found to be

not significant, with the exception of a very small positive association between the district-level primary NER and enrolment.

*Current attendance and drop-out*

Table A5.33 reports the results of estimation of the probability of a child currently attending school in the 5-17 age-range, given certain key characteristics using a probit model. The data subset used in this model includes only those children who had ever attended school so that the characteristics of current attenders may be compared to those of current 'drop-outs' who are the reference category. Few children in Ghana have completed basic schooling before age 17 owing to the prevalence of over-age enrolment and many of those who complete the basic stage at a relatively young age remain in school, so that most children not attending may be considered drop-outs. The effect of gender on the probability of a child currently attending school is significant in the pooled and individual survey round regressions, with boys being more likely to attend. In common with the effect on ever-attendance, the difference in probability between boys and girls decreased over the period, falling from 5.2 to 1.8 percentage points. Most of this change appears to have occurred between GLSS 3 and 4. Older children were found to be more likely to be currently attending in the lower age range, but like the effect on ever-attendance, the effect was found to be curvilinear and diminishing over time. A child's relationship to the household head was found to have a smaller and less consistent effect on current attendance. Fostered children (relatives) were between 2 and 3 percentage points less likely to be attending than children of the head in general, while foster children in GLSS 5 were around 4 per cent less likely to be in school. A higher proportion of young children in the household was found to have a small negative effect on the probability of current attendance, but taking account of this, children in larger households were not otherwise disadvantaged. Regional effects are notably different in the case of current as opposed to ever-attendance. All regional dummies attained statistical significance in the GLSS 4 current attendance model but only two were significant in the GLSS 3 model and in the GLSS 5 model. Current attendance was found to have improved by four percentage points ceteris paribus between the GLSS 3 and 5 surveys.

With regard to parental education, both mothers' and fathers' educations were found to be associated with lower drop-out, especially in the earlier survey rounds, but typically not at the primary level. Effects are typically found to be diminishing over time and are apparently strongest in relation to fathers educated to A level; estimated at a between 4 and 8 percentage point effect on the probability of current attendance. Household welfare has a significant (but small) effect on current attendance only in the pooled and GLSS 5 samples but when parents' education and household head's occupational characteristics are omitted the effects are larger, ranging from a 7% (GLSS 4) to a 12% (GLSS 3) effect on the probability of current attendance for an increase in welfare approximately equal to doubling it at the mean. Formal employment of the household head was found to have a weak positive effect only in the pooled sample and when the cluster mean of travel time to school was included, a weak negative effect of 1-2% per hour of travel was estimated. Further, as in the case of ever-enrolment, a weak association between the district-level primary NER and enrolment was found when including supply-side variables.

In order to examine the nature of and trends in progression through basic schooling and into post-basic education, a multinomial logistic regression model using the pooled sample was used to compare the determination of 'selection' into five educational attainment outcomes. Relative risk ratios are reported in Table A5.34. The sample employed is the group of adult household members aged 19 to 35 at the time of the survey. It may be expected that adults in this group will most likely have completed basic schooling. The model estimates the determinants of an adult having achieved less than completed primary schooling, completed primary schooling, completed lower secondary schooling or a higher level of education when compared to the reference category of adults who had never attended school. Males were found to be more likely to have reached all levels of educational attainment relative to never having attended school than females. This difference increases at higher levels so that males have a 'relative risk' of progressing to lower secondary school as opposed to never attending school as much as four times greater than females. Relationship to the household head was found to affect educational attainment significantly when compared to the attainment of the head. Spouses (most often wives) were considerably less likely to have progressed even as far as attending primary school and had a relative risk of

reaching the end of junior secondary school one third of the size of that of household heads (the reference category). Children of the household head were most likely to have made educational progress and servants least likely. Household size and composition was found to have notable effects on educational progression, especially with regard to higher levels of achievement. Household size was a significant determinant of all levels of progress, perhaps surprisingly changing sign in terms of its effect so that one unit of the log of household size in equivalent adults terms (around 2.7 adults) reduced the relative risk of a household member reaching the end of primary school when compared to never attending school by around one fifth but increased the relative risk of reaching levels of schooling beyond lower secondary by around the same proportion. However, this is in the presence of specific controls for dependency within the household. The proportion of children under the age of seven in a household was found to reduce the relative risk of a household member reaching post-primary education but only slightly. The same was true in relation to the number of household members over 59 years of age.

Much more important was the occupational or socio-economic status of the household head. When compared to the reference group of food-farmers, other groups were found to have a relative risk of achieving higher levels of education up to twenty times greater. The effects of belonging to more privileged socio-economic groups were found mostly to increase by level of education, with the private and public sector employee groups being associated with the largest effects. Household members in a household with a head in formal private sector employment had a relative risk almost seven times greater those in a households headed by a food farmer of progressing beyond junior secondary, three times greater for completing JSS and twice as large for completing primary. Household members whose heads were public sector employees had a relative risk of completing primary school twice as great as those with heads engaged in food farming, a relative risk of completing JHS four times as great and a relative risk of progressing further twenty times as great. Smaller but notable advantages were also found among households headed by informal private sector employees, export farmers, those in non-farm self-employment and those who were not working. These effects may be considered separable from the effects of income and consumption which is measured by the relative risk ratios for the log of household welfare. An additional unit of log-

welfare, approximately equal to the mean level of per capita welfare, is found to increase the relative risk that a household member had progressed educationally to all levels, particularly to the end of lower secondary school or beyond, being associated with a four times greater relative risk of accessing post-lower secondary education.

The dummy variables included for the survey rounds are significant in relation to all levels of educational attainment, with GLSS 3 as the reference category. Although typically household members included in both GLSS 4 and 5 were relatively more likely to have reached higher levels of education than those in GLSS3, there is little to suggest that there is a significant difference between the effects of GLSS 4 and 5, indicating that the most important improvements occurred in the period from 1991 to 1999. Urban residence was found to positively affect the relative likelihood of progression to the end of lower secondary school and beyond. Regional effects were found in some cases to be extremely large. Those in the Ashanti region, for example were found to have a relative risk of accessing primary school seven times larger than those in the reference region of the Upper West in the presence of these controls. The relative risk was nine times greater for completing primary school and 13 times greater for completing junior secondary. Other regions with strong positive effects included the Western, Central, Brong Ahafo and Greater Accra regions. It is notable that with regard to educational access beyond junior secondary schooling, regional effects are smaller. This may suggest that at these levels of schooling the effect of regional level supply is balanced by very large effects of affordability and socio-economic factors.

To examine these effects in more detail including with respect to change over time, a series of logistic regression models was employed comparing the determination of educational progression outcomes within appropriate age groups. These are reported in Table A5.35 in the form of odds-ratios. Model 1 compares those who have never attended school with those who attended primary school but dropped out. Model 2 compares those who had completed primary school but progressed no further with those who had dropped out of primary school. Model 3 compares JHS completers with primary completers and Model 4 compares those who went on to complete a level of education beyond the basic phase with those whose highest level was completed JHS. The age ranges used are intended to capture the groups who would be expected to have

reached their final schooling outcome in the eight year period prior to the survey concerned. This is intended to avoid including household heads as far as possible and to estimate effects as current as possible at the time of the survey. Table 5.36 shows the distribution of adults included in each model according to the outcome and reference categories by survey round. Of those whose education was less than completed primary school, 55-65% were never-attenders, decreasing somewhat over the period. Of those who had attended primary school but gone no further, around a third had dropped out of primary school with a slight increase in GLSS 5. Regarding those who had completed at least one stage of basic education, a fairly constant 71-73 % had completed JHS; and among those who had completed JHS, 24-35% had also completed a higher level, rising notably by GLSS 5.

**Table 5.36: Outcomes, reference groups and age ranges for paired logit models**

| Model | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Reference group | Never attender | Primary drop-out | Primary completer | JHS completer |
| % GLSS 3 | 65 | 33 | 27 | 76 |
| % GLSS 4 | 55 | 33 | 27 | 75 |
| % GLSS 5 | 57 | 37 | 29 | 65 |
| Outcome group | Primary drop-out | Primary completer | JHS completer | Post-basic completer |
| % GLSS 3 | 35 | 67 | 73 | 24 |
| % GLSS 4 | 45 | 67 | 73 | 25 |
| % GLSS 5 | 43 | 63 | 71 | 35 |
| Age range | 16-24 | 16-24 | 21-29 | 26-34 |

Source: Computed from GLSS 3-5

It is notable that the pseudo R squared values, while consistent across rounds, differ substantially between models. While the variables included in the models explain 20-26% of variation in progression outcomes regarding primary enrolment and post-basic education, they only explain 4-9% with regard to primary and JHS completion, which might indicate a greater importance of cluster, school and district level factors at these levels. Father's education is found to have a significant effect on outcomes in every model and survey round. These effects are also fairly stable over time. An additional year of education increases the odds of a child reaching the outcome level of education compared to the reference level by 7-12% regarding the primary drop-out outcome, 3-5% regarding primary completion, 3-4% for JHS completion and 4-11% regarding post-basic education. Male gender is associated with better odds of progression, with an apparent decline in effects between 1991 and 2006, while effects are largest for post-

basic outcomes, with boys having 57% greater odds of reaching these levels compared to ending schooling at completed JSS in 2005/6 compared to 130% greater odds in 1991/2. There is some evidence of lower progression rates by fostered children and of better progression in urban areas. Household head's occupation in formal employment is found to have very strong effects at higher levels of progression, but not at the basic level. These are fairly consistent over time for progression to levels post-JHS completion. A child in a household whose head is in public sector formal employment is found to have odds of reaching higher levels of progression 7-10 times greater than those whose household head is a food farmer; 2-4 times greater where private sector formal employment is concerned. Household welfare is typically found to have relatively large effects on the odds of progression, particularly with regard to higher levels of progression. In relation to post-JHS progression, an increase in welfare equivalent to approximately doubling it at the mean is found to increase the odds of higher level progression compared to JHS completion by 114% in GLSS 5.

Changes in regional effects over time in model 1 show a dramatic reduction in the importance of region in terms of gaining incomplete primary education relative to never attending. For example, while in GLSS 3 a child in the Brong Ahafo region had 18 times the odds of a child in the Upper West (the reference category) of enrolling and dropping out of primary school compared to never-enrolling, by GLSS 5 the effect was not significant. At higher levels of progression regional effects were almost never important in GLSS 3. But in GLSS 4, some regional effects appear to emerge in relation to primary completion favouring more advantaged regions. Significant effects also emerge in relation to completing higher levels of education as compared to JHS completion. But interestingly the pattern is a reversal of the pattern lower down the progression hierarchy, so that a child who has completed JHS in Brong Ahafo has only one third of the odds of a child in the Upper West of completing a higher level. While in GLSS 5 the primary completion effects are dramatically reduced compared to earlier rounds, the effects at higher levels typically strengthen, typically favouring less advantaged regions. Increases in access at the basic level made possible through expansion in supply, especially in deprived regions are likely to have reduced regional effects on lower levels of access at that level over time. However, numbers of pupils reaching JHS completion remained small in more deprived regions even in 2005/6, but

their chances of progression beyond that appear to have improved in relative terms when compared to other regions, controlling for important economic factors whose trends have typically favoured better-off regions. It may be suggested therefore that the position of equivalent children in other terms has improved from a supply side perspective, since regional dummies capture important differences in educational infrastructure. On the demand side, however, these effects may have been counterbalanced by rising welfare effects.

When available district-level indicators of school supply and quality were included in the GLSS 5 models, they were not found to be significant with regard to lower levels of progression, but were in relation to JHS completion and post-basic progression. The JHS PTR was found to be negatively associated at the 5% significance level with JHS completion when compared to primary completion to the extent that a decrease in the district-level PTR of 10 pupils per teacher is associated with a 35% increase in the odds of completing JHS ceteris paribus. An increase in the district level BECE maths pass rate of 10 percentage points in the district was found to be associated with an 18% increase in the odds of progressing to levels of education beyond JHS completion.

### 5.4 Summary

The results presented in this chapter show strong relationships between household education and welfare/poverty, but also demonstrate the considerable importance of contextual factors and employment selection. The benefits of education are found to vary by occupation as well as by educational level, with benefits of education being highest at the higher levels and being associated with selection into higher paying occupations. Disadvantage at the contextual level includes lower access to and quality of education as well as lower returns and lower levels of employment opportunity. Household education and welfare are found to affect initial enrolment, drop-out and progression and children in disadvantaged households, especially when located in poorer regions and employed in food-farming are considerably less likely to access the levels of education associated with notable economic benefits. This complex nexus of relationships and its interpretation is discussed in the following chapter.

# CHAPTER SIX

# DISCUSSION

## 6.1 Education, welfare and poverty

Household economic welfare levels improved in Ghana over the period 1991-2006 in models including a range of controls at household and contextual levels, consistent with economic growth and with descriptive results from secondary sources. However, while absolute poverty declined, consumption inequality increased, since redistributive effects worked on average against the poor. Extremely poor households typically derive two thirds of their incomes from agriculture, the sector in which earnings are the lowest; in which they improved the least and in which returns to education are also lowest. Rural areas of northern Ghana are particularly dependent on subsistence agriculture, a major reason for poverty, low educational access and low returns to schooling in these areas.

Modelling results indicate that generally the most important determinants of household welfare in Ghana are contextual effects, especially region and urban/rural location. When controlling for other factors, urban compared to rural areas are found to be associated with 30% greater log welfare, a difference which is fairly stable over time. The most advantaged regions are associated with an increase of around 50%, when compared to the least advantaged region. These contextual factors also increased the probability of a household not being poor by 20 and 27 percentage points respectively, in the pooled sample. Such effects on welfare equate to within-cluster consumption benefits, or returns to education, for the household head of around 12 and 15 years of schooling respectively, putting the dramatic importance of context into perspective.

Quantile regression shows further that the negative effect of living in the most disadvantaged regions is relatively larger for poorest groups. For example, living in the third poorest region (Northern) compared to the most disadvantaged (Upper East)

region was associated with a 41% increase in log welfare for the richest quintile but only a 23% increase for the poorest quintile. Advantaged groups strengthened their relative welfare position over time through the increasing effects of more advantaged regions and of the urban locations in which they more often live, through larger reductions in household size, and through proportionately greater access to education levels with high and increasing returns, among other factors. Moreover, over time, increases in welfare not due to changes in the effects of household and contextual factors (i.e. due to unobserved growth and redistribution effects) benefitted the poor least, with the poorest quintile's welfare rising by 3.4 fewer percentage points than the richest as a result.

*Occupational selection*

Part of the regional and urban/rural effect on welfare and poverty operates through differences in the odds of occupational selection (subsumed in the regional effects discussed above), linked to local employment opportunities. Regional differences in welfare are also found within the occupational groupings of household heads, so that, for example, food farmers are associated with notably lower welfare in the North than in the South when controlling for household characteristics. Examining occupational selection of household heads across regions, more advantaged regions and urban areas are found to be very strongly associated with selection into better paying forms of employment, especially waged work, informal employment and self-employment, when compared to food farming. The total economic benefit of employment in better paying occupations may be divided into the benefits of higher returns to education and the effects of higher income benefits not directly associated with education in these occupations i.e. higher earnings across the distribution of education. With controls, including for education levels, so that occupational selection effects may be considered not due to educational differences, a household head in the pooled sample in the relatively advantaged Western region has odds of being in public sector employment as opposed to food farming twice as great as one in the Upper West region, seven times as great where private sector employment is concerned, and almost four times as great where informal employment and non-farm self-employment are concerned.

Examining the welfare benefits of occupational selection, again controlling for education levels, households whose heads were in formal employment and non-farm self-employment were associated with log welfare 26-30 percent higher when compared to food farmers in the pooled sample, equating to a similar level of benefit to urban location or to 12 years of schooling. These benefits of occupational selection, which are not directly the result of individual-level investment in education, were also found to vary by region, especially where private sector formal employment, informal and self-employment are concerned. But these effects were found typically to benefit less advantaged regions, where far fewer workers are employed in these occupations, possibly indicating a 'scarcity premium'; but also due to the low level of income from food farming in these regions.

Further, examining welfare differences between survey clusters with a full range of controls, so that regional, urban/rural and household effects including education are removed, there remains variation in average welfare between clusters. Part of this is explained by differences in the availability of formal employment at the cluster level and an increase of formal employment by cluster of 10 percentage points is found on average to increase household welfare by 15% in the pooled sample, equivalent to 10 years of individual schooling. Cluster level differences in welfare are also associated with average levels of education at cluster level. While it is not clear how these mechanisms operate, variations in the extent of education and of formal employment by cluster, along with variation in average welfare levels are indicators of differences in economic opportunity at the local level, which are not due directly to education in the individual case. Migration of course enables individuals to benefit from higher levels of opportunity elsewhere. This is illustrated in findings reported in Chapter 8 in relation to the reasons given for migration from the North to Accra among *kayaye* workers.

While none of the important effects on welfare discussed so far may be attributed directly to individual level education per se, the education of individual household heads is found to have separate and notable effects on welfare and hence considerable household poverty reducing potential. Household education effects operate through several mechanisms. In addition to regional effects on occupational selection, individual and household characteristics, specifically educations levels, are associated

with selection within regions. These effects are often large. For example, reaching the end of basic education as opposed to having no education is associated in the pooled sample with six times greater odds of being in public sector employment as opposed to food farming, and these effects rise dramatically with more education. Further, within clusters, completed basic education is associated with odds of being in formal employment, compared to all other occupations, twice as great as for no education in GLSS 5, again rising dramatically by level and over time for higher education. At lower levels of education, up to the end of secondary schooling at least, however, these selection effects within clusters are found to be decreasing over time since the comparable selection effect of basic education in GLSS 3 was twice as large as in GLSS 5. This may be because proportionate formal employment levels and productivity remained static over the period, while educational attainment levels increased significantly, so that employment has been subject to 'qualifications inflation' (Dore 1976). Large selection effects with regard to formal employment are consistent with Kingdon and Soderbom (2007), whose estimates of returns to education are considerably reduced when controlling for selectivity.

*Returns to education*

Further, linked with their occupations, better educated individuals in advantaged regions are found to work more hours per week and more weeks per year, further increasing earnings for better educated workers in more lucrative occupations, especially formal employment but least of all farming. Finally, within occupations, more educated workers earn more. Using hourly earnings to remove the effect of longer working hours by better educated workers, the wage return using a linear term for education is found to be around 6% on average per year of schooling within households for those in formal wage employment, a measure which may be considered fairly robust to endogeneity bias and which is consistent with Kingdon and Soderbom's (2007) finding for Ghana of around 7% for men and 4% for women and also with other estimates using recent data (Teal 2001; Shultz 1999; Sackey 2008).

There is strong evidence of rising marginal effects on hourly wages by level of schooling as well as an apparently increasingly convex relationship between years of

schooling and wages over time. This may be due to higher quality of later years of schooling (supported in the results for returns to qualifications) and to labour market demand for skilled relative to unskilled labour. The convex relationship accords with the findings of Teal (2001) and Kingdon and Soderbom (2007); and the increasing convexivity with Schultz (1999) and Sackey (2008) for Ghana and Colclough et al. (2009) for a range of countries. Within regions, completed basic education is found to increase earnings in GLSS 3 and 4 only, with a declining effect. But beyond that level, effects are found to be large and at tertiary level, possibly rising over time, a finding also consistent with Sackey (2008) and Schultz (1999). The benefits of basic education in terms of returns in wage earnings are thus found to be weak by 2005/6, while this does not negate the importance of basic education in determining access to wage employment and its substantial benefits relative to other occupations across the range of education levels. Returns to schooling in wage employment at the regional level were found to be highest in the two most disadvantaged regions, Upper East and Upper West. This is consistent with the strong selection effect of education in these regions and may also suggest a 'scarcity premium' in relation to highly educated workers within wage employment.

The benefits of or returns to education in other forms of employment is found to be somewhat lower than in wage employment. Estimates are between 1 and 4 percent per year of schooling, although these estimates are at household level using the household head's schooling only so are less robust to endogeneity. Nonetheless, these estimates accord with Kingdon and Soderbom (2007). No evidence was found of rising income benefits (a convex relationship) at higher levels of education outside of formal employment.

When the benefits of education are examined in per capita consumption rather than in earnings, to better explore effects on poverty, the consumption 'return' is of course a weighted composite of the returns to education in all sources of income. The effect of education in terms of years of schooling on consumption or welfare is found to be convex and fairly consistent over time, equating to around two percent per year of schooling at ten years, similar to the finding of Teal (2001). Like wage returns, consumption returns to education are also found to be high for post-secondary levels of

education (consistent with Canagarajah and Portner (2003)); and to be increasing over time at these levels, while they are largely constant over time below it. Estimates for lower levels of education are low compared to those of Kyreme and Thorbeke (1991), supporting the suggestion that they declined during the 1990s. The convex relationship may be attributed firstly to the convexivity of wage returns to education but secondly to the weak but nonetheless convex relationship between education and incomes from rents and remittances. Thirdly, the convexivity is due to occupational selection effects in that as education levels rise, household heads are more likely to be in more lucrative forms of employment, where returns are higher (and convex) and working hours longer Equally, as education levels rise, household heads are less likely to be in other forms of employment, especially farming, where returns are low. This is consistent with the pattern of non-poor households deriving a substantially higher proportion of their incomes from wage employment illustrated in 4.7, Figures 4.23-4.25.

The benefits of education on welfare are found to vary between contexts. Using evidence from quantile regression without controlling for occupational effects, they are not found to be lower in general for poorer groups within regions and urban/rural locations, however. Nonetheless, when examined for individual regions, with occupational controls, consumption returns are found to be lowest in disadvantaged regions (e.g. Upper West) and highest in Accra, consistent with the distribution of occupational opportunity. Recalling that wage returns to education are typically high in these regions, and that selection effects of education are also typically strong, the results appear to be due to the fact that regional selection effects into occupations with higher returns are very low when compared to more advantaged regions, outweighing individual level education effects on average. To illustrate, the effect of living in the Western region compared to the Upper West on selection into private sector employment is approximately equivalent to increasing education from zero to senior secondary school qualifications. Households in more advantaged regions also benefit disproportionately from urban effects on occupational selection. When examining returns to education within non-wage occupations by region, including food farming in which the majority of household heads in the North is employed (84% in the Upper West compared to 4% in Accra in the pooled sample), however, no evidence was found

for lower returns in the North, indicating that while farming is apparently more productive in general in the South, the relationship with education is not stronger.

In addition to regional differences in the consumption benefits of education, there are also fairly large differences at the cluster level so that at one standard deviation below and above the mean, the consumption benefit of an additional year of schooling of the household head at 5 years of schooling is found to vary from 0.83% to 2.17% in the pooled sample. This variation is found even when taking account of the positive interaction effect between household and cluster levels of education. Benefits in consumption terms typically begin to accrue only after approximately four years of schooling and then fairly weakly (4 years increases welfare by 2.4% within clusters in the pooled sample and GLSS 5) and begin to rise substantially after nine years (12.2% increase at 9 years), which is the end of the basic education cycle.

Thus, there is little to support the contention that either consumption or wage returns are high in relation to lower levels of schooling in Ghana or even that they were at the beginning of the period in 1991. This finding is generally consistent with earlier work (e.g. Teal 2001; Canagarajah and Portner 2003). This is an important finding for two reasons, firstly that progression beyond that level remains relatively limited, especially in disadvantaged regions and among the poor and secondly because post-basic progression most often requires a substantial investment at household level; a substantial reason why progression remains low among disadvantaged groups. Beyond around 7 years of schooling of the household head, increases in income are increasingly associated with rising wage incomes (see Figure 5.5) consistent with the suggestion that the rise in incomes associated with post-basic education is substantially due to selection into wage employment and to the convex returns in that occupational group.

### *6.2 Participation*

Initial access to education in Ghana increased substantially between 1991 and 2006, in part due to increased school availability and reduced costs linked to policies such as FCUBE. These changes are likely to have reduced the impact of costs and credit constraints found in earlier studies (e.g. Lavy 1996) and to have reduced the demand for

child labour (see Ranjan 2000), consistent with a decline in the number of children in work. The proportions of children who had ever been to school and who were currently attending improved in descriptive data and also in models including controls for important socio-economic and demographic indicators. The effect of gender on participation declined markedly, in line with a key policy objective. With regard to ever-attendance at school, regional effects remained very important, but declined substantially over the period, consistent with improving educational supply in disadvantaged regions. By 2006, the gap in probability of a child ever attending between the most and least advantaged regions was halved from 18 to 9 percentage points. Effects of household welfare, urban location and formal sector employment on ever-attendance were also relatively small by 2006. Education levels among adults in the household also reduced in importance, but by GLSS 5, primary education completion of both a child's mother and father increased the probability of ever attending by more than 10 percentage points, so that this was by then arguably the most important influence on initial enrolment. Beyond the basic level, the influence of parental education was not found to increase markedly, indicating that it is basic education which for the most part raises parental demand and preferences for enrolment. This pattern of improving access and decreasing inequality is generally pro-poor and is consistent with the finding that the poor captured an increasing share of primary school participation over the period (Coulombe and McKay 2007). However, concerns remain regarding possibly widening quality differences between regions in basic education (World Bank 2004b) which also affects the extent to which expansion is pro-poor (DFID 2004).

Effects in relation to current (at the time of the survey) when compared to ever-enrolment indicated a smaller influence of supply at the regional level, unsurprisingly, since given that a child has initially enrolled, physical access to schooling is less obviously an obstacle. With regard to parents' education, however, primary education was not found to improve current enrolment, i.e. to lessen drop-out. Middle schooling and above did however have this effect, with slightly stronger effects at higher levels of schooling. This suggests that reaching higher levels of education themselves raises parents' demand and preferences for continued schooling among their children, consistent with the view that parents' own education levels proxy their preferences, but

suggesting that parental education to primary level is associated with preferences for initial but not necessarily sustained enrolment. There was little suggestion that household welfare and formal employment have very large effects on retention or drop-out, so that patterns in regard to current attendance are not found to favour privileged groups substantially, except through the association with parental education.

Among young adults, alongside individual characteristics and household composition factors, household welfare and especially region were found to have notable effects on progression outcomes within the basic phase so that, in general, progression favoured economically advantaged groups but regional, occupational and welfare effects at lower levels of progression diminished over time so that changes in progression did not benefit advantaged groups disproportionately. Nonetheless, by 2005/6, completing JHS as opposed to only completing primary school was still associated with a 48% increase in log household welfare, and substantially with southern regions. Completing primary school as opposed to dropping out was associated with a 31% increase in log welfare too, so that poverty remained a considerable barrier to progression within the primary school. These young adults had not necessarily benefitted, however, from recent policy interventions. At the same time, descriptive data show that the proportions of children completing the basic phase of education and passing the BECE examination remained low and static throughout the period. Even at primary level, completion rates were found to be similar in 2008 (UNICEF 2010) to those in 1991. Accordingly, and by contrast with the pattern of pro-poor initial access, growth and educational expansion at the primary level, patterns of progression to completion of the basic education cycle are not found to have evolved generally in a pro-poor direction.

Patterns of progress beyond the basic phase are found to benefit the non-poor disproportionately and for the later stages of education, increasingly so. Returns to education in the small but growing tertiary sector, for example, are high and apparently increasing, while the highest welfare quintile captured two-thirds of all participation in the sector in 2005/6 and the poorest quintile showed little improvement in participation either at the secondary or the tertiary level (Coulombe and McKay 2007). In general, there is little evidence of weakening welfare effects and urban location and household head's occupation continued to have very large effects on post-basic progression in

2005/6. Progression beyond JHS, when compared to JHS completion, which is already associated with considerable advantage, is associated with more than doubled household welfare, consistent with Checci's (2001) finding that income effects are especially important for higher levels of access. Those in households headed by formal employees when compared to food farmers have odds of progression up to 8 times higher and urban areas with odds 43% higher, indicating large effects of socio-economic groupings (see Dreze and Kingdon 2001).

Post-basic education remains unaffordable for most households in Ghana, most of all for the poor; and following basic access improvements in the 1990s, opportunity for progression became the major axis of educational inequity. Ironically perhaps, those in the poor Northern regions had apparently higher odds of progressing net of other factors given that they had completed JHS, so that region itself was not a disadvantage for the few able to overcome these more serious obstacles. This may be due to the tiny numbers able to do this in the North compared to the greater competition for places in the more affluent South, another apparent 'scarcity' effect. Nonetheless, there is a yawning North/South divide in Ghana where educational progress is concerned, attributable considerably to differences in economic welfare.

### *6.3 Education and Poverty*

The total benefits of basic education in (log) consumption were found to be relatively modest at around 12% on average, but are nonetheless potentially poverty reducing at the margins. However, the average food-farming household with an uneducated head in the three northern regions had per capita welfare of 523,530 Cedis (at 1999 prices in Accra), well below the 700,000 threshold for extreme poverty; and the increases due to basic education would be expected to increase it to only 591,484 Cedis, other things equal and ignoring the potential additional benefits of education such as on household size. Substantial welfare benefits of education and those which may be considered sufficient to alleviate poverty among the most disadvantaged depend on receipt of post-basic schooling.

Moreover, access to post-basic education among children in poor households is seriously limited by low levels of economic welfare, potentially resulting in intergenerational poverty transmission. Access to basic education in a limited sense has expanded in a pro-poor way, but access to completed primary school and higher levels of education remain linked to economic privilege associated with household wealth and occupation and with context in ways that seriously disadvantage the poor. Improved access to basic education of current cohorts may be expected, however, to have an intergenerational benefit through higher enrolment of future children and reduced future family size alongside fulfilling a basic human right and yielding other social benefits. However, the evidence suggests that the economic benefits of basic education are likely to be small going forward, in the absence of large quality improvements or substantial shifts in labour market opportunity. Expansion of educational access per se has not specifically disadvantaged the poor, but the evolution of contextual effects and of the returns to education has; so that intergenerationally, today's poor may face a greater struggle to educate their children to levels where real economic benefits are accrued.

Marginal benefits of additional education rise steeply in the post basic phase, but it is exactly this phase from which disadvantaged groups are most often excluded, creating a potentially self-reinforcing 'education-poverty trap'(see Knight, Shi and Quheng, 2008). At the highest level, while numbers remain small, a particular and increasing welfare gap is opening up between those who reach tertiary education and the remainder. More generally, uneven distribution of economic opportunities and consequently of access to the most lucrative educational opportunities remains a serious issue in Ghana. Where opportunity is strongly clustered, there is considerable potential for the reinforcement of advantage and disadvantage. Boakye-Yiadom (2004) illustrates this point in relation to the urban-rural divide in Ghana.

> Ghana's rural-urban welfare gap is influenced by the concentration in urban areas of business and industrial activity, and is sustained by the resultant inequalities in education, access to healthcare, and basic amenities…[T]he concentration in the urban centres of better-educated workers tends to result in other education-related inequalities between rural and urban localities. This is linked to the fact that better educated workers generally wield considerable economic, social and political clout, compared to the less educated.
>
> (Boakye-Yiadom, 2004, pp. 30-33)

'Pro-poor' educational expansion as conceptualized here in terms that require that the poor benefit disproportionately from increased access to the economic benefits of education was for the most part not achieved in the period from 1991 to 2006. Nonetheless, access to education for the poor did improve, and the share of the population benefitting from educational effects on welfare increased. The pattern may be considered analogous to the general trend in poverty itself, that is of falling absolute poverty alongside rising inequality.

# CHAPTER SEVEN

# ACCESS TO EDUCATION IN A DEPRIVED DISTRICT OF GHANA: SAVELUGU-NANTON

## 7.1 Introduction

The previous chapter brought into focus the particularly disadvantaged position of food-farming households in northern regions of Ghana concerning household welfare, occupational opportunities and educational access. It highlighted the potentially increasing difficulty among this group in gaining access to the levels of education associated with significant poverty reduction. This chapter explores the issues of basic educational access, a prerequisite for further progression, in one deprived district in the Northern Region, Savelugu-Nanton, where food farming is the dominant occupation and where both welfare and educational access were especially low historically. It examines the literature and available secondary evidence in relation to the issues in the district and reports the findings of exploratory interviews with key informants on the issues around educational access in context. It provides the background for the study in the following chapter of two emerging issues which are of particular local significance with regard to educational access in the district - child-fosterage and youth migrant labour (*kayaye*). This chapter and the next primarily address research sub-question eight, which centres on the role of contextual factors including cultural beliefs and practices at the local level in determining educational access and progression.

## 7.2 Savelugu-Nanton District and The Dagomba

Savelugu-Nanton is an administrative district within the Northern region of Ghana located close to the regional capital, Tamale (see Figure 7.1). The population was 91,415 according to the 2000 census and population growth was found to be above the Ghana average (3% compared to 2.6% in 2005). The district is part of the savannah ecological zone and is inhabited mainly by the Dagomba ethnic group. Dagbani is the

most widely spoken language, although schooling is mainly in English or English and Arabic, while Islam is the dominant religion. Development indicators in the district are low. For example, the district had the highest rate of under-5 mortality in Ghana in 2000, at a staggering 239 deaths per 1000 live births (GSS 2005a:20), compared to 113.7 in Ghana as a whole (GSS 2005b:188). This fact may be considered related to certain demographic and cultural features of the district, since the GSS (Ghana Statistical Service), finds that in Ghana, in common with other African countries, child mortality increases with birth order and with shorter birth intervals as well as in cases of polygamous unions, which are common in the district (GSS 2005b:191). Agriculture engages 97% of the labour force in the district, mainly in the form of rain-fed subsistence crop farming. While the main economic activity of the Dagomba in the past and today is food-farming, traditionally there was considerable trade specialisation according to inheritance (Oppong 1966:19). Other economic activities currently include agricultural processing, small-scale industry, basic services and petty-trading, often practiced in addition to farming.

**Figure 7.1: Location of Savelugu-Nanton district of Ghana**


Historically, and to a large extent today, the Dagomba live in extended family arrangements organised around a family compound. Oppong explains:

> The basic unit of social organization is the household living in a single walled compound or house. Its nucleus is an elementary or polygamous family to which may be attached the descendants of the head's grandfather, that is the head's classificatory or full brothers and sisters and their children and grandchildren, and since marriage is virilocal, also the head's wives and his sons' and brothers' wives (Oppong 1966:10 )

With regard to domestic organisation, the household head's sister, or less often his mother or his first wife is the senior woman. Where polygamy is practiced, domestic and marital roles are performed by each wife in turn (see Oppong 1966). Child fosterage (considered in detail in the next chapter) is widely practiced in Savelugu-Nanton, and is deeply embedded in cultural practice. Oppong explains that fosterage partly accounts for the complex household structures in Dagbon:

> The strong ties daughters and sisters retain with their natal homes and the practices of fostering are such that in a sample of households there were found to be as many people related to the household head through his daughters and sisters as through his brothers and sons. (Oppong 1966:10 )

Another noteworthy feature of the district and which results in dynamic household composition is the Dagomba custom of dɔɣ'kuna[13], in which a woman returns to her parents' home for an extended period, typically 2 or 3 years shortly after giving birth to a child, especially after the birth of the first few children and partly as a method of birth-control (UNICEF/IFPRI 2005:49).

### 7.3 Education in Dagbon: Historical perspective

In educational terms it is worth noting that the Dagomba areas of Northern Ghana have been associated with particularly low levels of access ever since the arrival of formal education in colonial times. Evidence is available from work conducted by Christine Oppong in the 1960s and 70s. She notes in her 1966 study that:

> certain factors appear to have inhibited educational development, even as far as the limited opportunities would allow...An examination of data from the 1960 Census shows that school attendance in the Dagomba area is strikingly low, even in comparison with neighbouring peoples of northern Ghana...Nor is it simply a case of schools not being available. Many schools opened before and since 1960 have had great difficulty in trying to fill their vacant places (Oppong 1966:17)

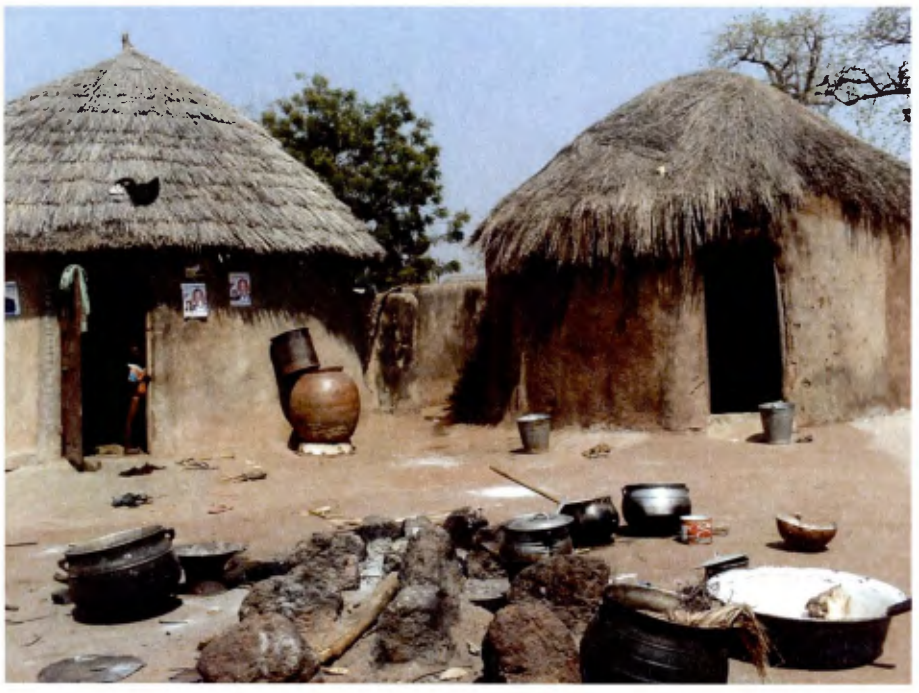
[13] Dagbani orthography

She explains some of the reasons given for resistance to schooling in her enquiries among the Dagomba, related especially to the need for child-labour:

> Typical replies to the question, "Why do all your children not go to school?" are: "If they did, who would feed them? Who would farm? The cattle herders cannot go to school; can we throw our cattle away? If the grass cutters go to school it is very hard for the horse owners." Even a man who has been educated himself will say "Some boys must go to school, others herd cattle, others cut grass." (Oppong 1966:19)

The agricultural economy in Dagbon traditionally relies somewhat upon forms of children's work which may be difficult to combine with formal schooling. Parental concerns about youth migration and attitudinal change, historically at least, also played an important role in discouraging enrolment. Oppong found that parents' fears and prejudices that educated children may spurn traditional culture, customs and values, including respect for elders and for their illiterate parents, in addition to their fear that educated children may be unwilling to farm and may be tempted to migrate, lay in part behind historically low enrolment (Oppong 1966: 23) in the 1960s.

**Photograph 1: Dagomba village, Savelugu-Nanton district (2010)**



Source: Fieldwork visit 2010

In the period following independence, access to basic education had expanded rapidly in Ghana generally, but educational indicators remained especially low in Dagbon right up until the most recent drives to improve school participation. Oppong cites an early school-based study (spanning 1956-64) in the immediate post-colonial period which indicates the strength of resistance to state-schooling in Dagbon, particularly for girls:

> No girls and less than 15% of the boys had been enrolled voluntarily by inhabitants of the village. More than half of the villagers' children in the school had been recruited by the chief and titled officials under external pressure; the rest were compulsorily recruited at random by the sanitary inspector. Of the children sent voluntarily, about a third were the children of outsiders temporarily employed in the village, teachers, policemen etc...This school does not appear to be an isolated example. (Oppong 1966:22)

She notes that, partly as a consequence of low education levels, only 2% of employed Dagomba held professional technical or administrative posts according to the 1960 census – one quarter of the national average and the lowest rate among the four Northern traditional states (Oppong 1966:18). In the same census, only 11.8% of the male population aged 6-14 was found to be attending primary school, but with another 32.2% in Koranic schools. Moreover, cultural attitudes towards Koranic and other forms of education among the Dagomba may have also inhibited enrolment in local district schools. Oppong suggests that historically, little distinction was made between forms of 'book learning' and that Koranic education may indeed have been the preferred alternative (Oppong 1966:23). The importance of Koranic education remains notable in Savelugu-Nanton, where a number of public schools end tuition at midday to permit instruction in Arabic in the afternoons.

A further reason for the apparent reluctance to send children to school in the past is found in the apparent efficacy of established indigenous educational practices among the Dagomba. These include a custom of sending children away for education or training under arrangements of fosterage. Oppong argues that the relatively sophisticated traditional system, integral to the dominant subsistence economy remained viable, at least in the 1970s, in terms of preparing young people for their adult occupational and social roles (Oppong 1973:71). Further, she suggests more generally the apparently unenthusiastic Dagomba response to the introduction of public schooling is linked to traditional authority structures, cultural beliefs and practices, to the

relatively low intensity of foreign contacts, the relatively low social status of women and the traditional patterns of social and spatial mobility (Oppong 1966:17).

Mahama outlines the traditional roles played by children in Dagomba society, some of which may be considered relatively antithetical to formal schooling, while potentially including a considerable informal education and training dimension. These kinds of work continue to be performed by children, albeit more often in combination with schooling. With regard to a boy,

> He goes to the farm to do light jobs such as sowing of grains, driving away animals or birds...At home he would be made to look after sheep or fowls...As the boy grows he is made to do weeding in the farm, which is for his guardian. If the child is in a Muslim home, the first lessons in Islam are given to him...He will take the lessons in the morning before he goes to the farm and in the evening when he comes back from the farm. (Mahama 2004:147-8)

While in the case of a girl,

> she is taught how to pound soup ingredients in a mortar, how to sweep the room, and how to wash dishes. She also learns how to hold and look after babies when the guardian is engaged in some domestic work. As she grows, she is introduced to cooking, washing of clothes, fetching and carrying firewood or water. She is also taught how to make some types of food for sale.
> (Mahama 2004:147-8)

Oppong describes children's work similarly, emphasising that all children are gainfully employed from an early age. The importance of the tasks performed by children is such that she argues that:

> compulsory full-time education for every child over five or six will entail an agricultural revolution in which the services of the young may be disposed of without hardship. This revolution is already in process however as mechanisation of agriculture gets underway and systems of co-operative use of farm machinery become established (Oppong 1973:72)

On this last point, despite more than thirty years having passed and while there is some commercial farming in Savelugu-Nanton along with some mechanisation in processing, in the form for example of a factory for shea butter extraction, unmechanised subsistence farming remains by far the dominant form of agriculture and livelihood. The process Oppong describes has been slow at best and the role of children in agricultural work remains important.

### 7.4 Contemporary Education in Savelugu-Nanton District

Figure 7.2 below illustrates the locations of educational facilities in the district in 2005. Purple squares show locations, mostly villages, with primary schools only. This is clearly the vast majority of settlements, with secondary schools being located only in Savelugu town and the surrounding settlements in the more densely populated southern half of the district. Figure 7.3 illustrates variation in poverty levels within the district and shows that the area surrounding Savelugu is the most well-endowed and the North and East of the district are the least; to a considerable extent in common with the distribution of educational facilities.

Table 7.1 below shows the results for adult literacy indicators in the district from a UNICEF/IFPRI survey in 2004. Around one fifth of household heads could read, with a slightly lower proportion being able to write. Less than 10% had ever attended primary school. Among primary care-givers (mainly women), the figures were remarkably low, with less than 5 % being able to read/write or having ever attended primary school.

**Table 7.1: Adult literacy in Savelugu-Nanton 2004 (%)**

| Household Head (HHH) | | | Primary Care Giver (PCG) | | |
|---|---|---|---|---|---|
| *Literacy Reading* | *Literacy Writing* | *Primary School Attendance* | *Literacy Reading* | *Literacy Writing* | *Primary School Attendance* |
| 20.1 | 17.8 | 9.2 | 3.0 | 2.5 | 4.4 |

N=1,685 (HHH) 1,668 (PCG) Source: UNICEF/IFPRI (2005)

GLSS 5, conducted in 2005/6, included four censal enumeration areas[14] in Savelugu-Nanton District. They are not representative of the district as a whole. Nonetheless, they provide illustrative information. Overall, more than half of households in the sample were poor or extremely poor in consumption terms. Table 7.2 reports the educational status of household members in the sample in terms of whether they had ever attended school, by age group. No surveyed household member over the age of 51 had ever attended school, consistent with historically low levels of adult literacy. In the age groups covering the 31 to 50 range, very few had attended, while less than one third of those aged 21 to 30 in 2005/6 had ever attended school. The pattern shifts somewhat

[14] The total number of enumeration areas sampled in GLSS 5 was 500, so that the district sample is less than one percent of the GLSS sample, comprising 80 households.

in the 6 to 20 age groups where around two thirds had ever attended. The figures overall suggest that, since this last group would have been expected to enrol in P1 in 1991 or afterwards, it was only fairly recently that having attended school ceased to be relatively rare in Savelugu-Nanton, despite policy initiatives at the national level intended to provide access to basic schooling in the post-independence period and subsequently in the 1970s.

**Table 7.2: Ever-attendance at school by age group in Savelugu-Nanton 2005/6 (%)**

| **Age group** | **51+** | **41-50** | **31-40** | **21-30** | **11-20** | **6-10** |
|---|---|---|---|---|---|---|
| **Expected year of enrolment in P1** | **<1960** | **1961-70** | **1971-80** | **1981-90** | **1991-00** | **2001-06** |
| **Attended** | 0 | 4 | 3 | 12 | 36 | 35 |
| **Never Attended** | 17 | 14 | 32 | 28 | 18 | 15 |
| **Total** | 17 | 18 | 35 | 40 | 54 | 50 |

Source: Computed from GLSS 5

With regard to children's (aged 6-18) enrolment in primary school in recent years, information is available in the EMIS[15] (Education Management Information System) data. Table 7.3 below summarises the key indicators for 2003/4 which are compared to the most recent figures – from 2008/9, to illustrate recent trends. The Primary Net Admission Rate (NAR) in 2003/4 was 23.5%, being slightly higher for boys and lower for girls. This indicates that less than a quarter of pupils of age six were admitted to Primary 1. The Gross Admission Rate (GAR) showed a much higher figure of 76.2%. In line with the prevalence of 'over-age' enrolment in Ghana, the comparison between NAR and GAR indicates a high incidence of over-age enrolment in P1, but a relatively low level of enrolment overall. This is clarified in the primary-level Gross and Net Enrolment Rates (GER and NER). In particular, the primary NER indicates that in 2003/4 less than half of all of-age children were enrolled, again with a higher rate for boys compared to girls. The CWIQ (Core Welfare Indicators Questionnaire) survey in 2003, which has a design intended to be representative at the district level, found the primary NER in Savelugu-Nanton to be 53.9%, slightly higher but broadly consistent with the EMIS[16]. The lower secondary NAR indicates that less than 7 % of children of the expected admission age for lower secondary school were actually admitted to lower

[15] EMIS data are collected as part of an annual Ministry of Education school census. Population figures are derived from the 2000 Census conducted by The Ghana Statistical Service (GSS) and an estimated population growth rate is used to estimate values beyond 2000.

[16] There are typically differences between survey and administrative data in Ghana owing to differences in definition and in groups included according to survey design etc.


Source: CERSCIS (Centre for Remote Sensing and Geographic Information Services), Ghana

secondary school in 2003/4. The NER is also very low, with less than one fifth of children in the appropriate age group enrolled in 2003/4, being less than 13% for girls.

**Table 7.3: Basic education enrolment indicators for Savelugu-Nanton district 2003/4.**

| Level | Indicator | Total | Boys | Girls |
|---|---|---|---|---|
| **Primary** | GER | 0.688 | 0.809 | 0.558 |
| | NER | 0.490 | 0.559 | 0.417 |
| | GAR | 0.762 | 0.841 | 0.683 |
| | NAR | 0.235 | 0.247 | 0.223 |
| **Lower Secondary** | GER | 0.507 | 0.637 | 0.328 |
| | NER | 0.192 | 0.239 | 0.127 |
| | GAR | 0.562 | 0.709 | 0.369 |
| | NAR | 0.066 | 0.089 | 0.043 |

Source: MoESS EMIS data 2003/4

When compared to the figures for 2003/4 some figures for 2008/9 (see Table 7.4) show dramatic improvement. Most notably, the primary NAR is found to have increased threefold since 2004, so that by 2009, three quarters of pupils of the expected admission age were actually admitted to P1. The primary NER also increased so that more than three quarters of primary-school age children were enrolled by 2008/9, with a difference of around fifteen percentage points between boys and girls. One important policy initiative introduced in the intervening period has been the Capitation Grant, which may have been an important influence especially where poverty was a barrier to age-appropriate entry as was the case in Savelugu-Nanton. Enrolments at lower secondary level in general did not show the same level of improvements when compared to the primary level. The NER remained low with just over a quarter of children of the appropriate age being enrolled in 2008/9. The NAR rose to almost 19%, however, indicating a notable improvement in age-appropriate entry, consistent with pupils moving through primary school at lower ages. Further, the GER increased from 50.7 to 72.6%, indicating an increase in total enrolment regardless of age at the lower secondary level. National figures, however, show a primary NER of 87.4% and an NAR of 71.5% alongside a lower secondary NER of 47.8% and an NAR of 43.6%, considerably higher than in Savelugu-Nanton. Differences between net and gross figures are also greater in Savelugu-Nanton (indicating a greater prevalence of 'over-age enrolment'), as are gender gaps (see Appendix D3-4 for details).

The 2009 EMIS data (see Appendix D3) also included results from the BECE (Basic Education Certificate Examination). Around one third of pupils achieved a pass mark in maths, English and social studies and around three fifths in science. The number of boys who sat the examinations was more than double that of girls, and boys' pass rates were five to thirteen percentage points higher. The BECE pass rates are around 60% in all of the core subjects at the national level, generally much higher than in Savelugu-Nanton; and gender differences are notably smaller in percentage point terms nationally. The SNDA (Savelugu-Nanton District Administration) confirms that gender disparities are a particular issue:

> There exists a gender parity gap. The situation emanates from poor retention of the girl child in school especially at the JSS level. The possible reason for this situation could be that at the JSS level, the girl child begins performing the multiple domestic roles such as fetching water, cooking, washing sweeping and cleaning just to mention a few in the family and thus has little time for academic work (SNDA, 2011)

The SNDA also reports that performance in WASSCE (West African Senior School Certificate Examination) is poor:

> In 2005, whilst four students qualified to enter the University from Savelugu SSS, five representing 3.5% of students sitting for the examination qualified from Pong-Tamale SSS. The reasons for the abysmal performance at the SSS though could result from poor teaching, are also partly due to the quality of students admitted. (SNDA, 2011)

**Table 7.4: Basic education enrolment indicators for Savelugu-Nanton district 2008/9.**

| Level | Indicator | Total | Boys | Girls |
|---|---|---|---|---|
| **Primary** | GER | 0.832 | 0.921 | 0.738 |
| | NER | 0.781 | 0.857 | 0.699 |
| | GAR | 0.885 | 0.965 | 0.805 |
| | NAR | 0.743 | 0.818 | 0.668 |
| **Lower Secondary** | GER | 0.726 | 0.807 | 0.614 |
| | NER | 0.278 | 0.292 | 0.258 |
| | GAR | 0.772 | 0.857 | 0.661 |
| | NAR | 0.188 | 0.204 | 0.167 |

Source: EMIS data 2008/9

EMIS data on the condition of schools show that around one third of public classrooms needed major repairs. With regard to teacher training, two thirds of teachers in public primary schools and one third in public lower secondary schools were untrained. More

than four fifths of public basic school teachers were men compared to three fifths nationally. The proportions of trained teachers are also considerably lower in Savelugu-Nanton. For example, only 10.9% of male public basic school teachers were trained in 2008/9, whereas nationally the figure was 56.9%. These findings accord with the SNDA's identification of key challenges in the education sector – which include trained teacher retention, early marriage; *kayaye*; difficulties with school supervision; inadequate teacher accommodation (especially electricity); gender disparities and parental apathy with regard to education (SNDA, 2011).

Overall, summary indicators for the district show distinct disadvantage in both qualitative and quantitative terms, when compared to the national picture, particularly where girls and transition to secondary school are concerned.

**Photograph 2: Primary school pupils, Savelugu-Nanton, Ghana**

Source: Fieldwork visit, March 2010

## 7.5 Exploratory Interview Findings

Exploratory interviews were conducted with education professionals in the district, as described in Chapter 3. The interview schedule is included in Appendix E2. Interview

findings are discussed under four emergent themes - culture and attitudes to education, schooling provision, livelihoods and children's work and affordability of schooling. These bear close resemblance to the themes identified in the interview schedule, but also take account of the emphasis given by respondents to issues impacting on educational access in the district. Further emergent themes, considered in detail in the next chapter, were fosterage and *kayaye*. Respondents commented on the negative impact of child-fostering on educational access for fostered children in every interview. In almost every interview, *kayaye* emerged as a negative influence on access, and this was often linked to the effects of fosterage. These issues were considered particularly important in the district and, while not unique, are distinctive cultural and socio-economic phenomena which are less well studied causes of low educational access, particularly in the context of Northern Ghana.

*Culture and Attitudes to Education*

Among cultural factors impacting on children's access to conventional formal schooling, interviewees mentioned parents' own low levels of education and attitudes to schooling, a preference for Koranic schooling among some families, the practices of polygamy and fosterage and the impact of traditional work roles of children. In general terms, many cited parental attitudes as a barrier to enrolment or consistent attendance. However, when asked to comment on changes in attitudes over time, one circuit supervisor added that

> In the last 7 or 8 years, people's level of education has changed; most of them are getting the awareness of education.

On a more specific manifestation of the effect of low parental education, one head teacher commented that lack of adult education relative to other areas of Ghana may be associated with supply problems such as overcrowding, through the relative lack of voice of parents in the district:

> It is also a problem with the parents and their own education, in the South there would never be a class with over 70 students because the parents would complain.

While seven interviewees explained that preference for Koranic education inhibits access to secular schooling. One explained that

> They feel that the formal schools will try to change the posture or...divert their children from the Islamic perspective

In relation to English-Arabic schools in the district which combine both secular and Koranic instruction, one interviewee explained that the conflict between the two educational approaches is also manifest in the schools themselves:

> In these English/Arabic schools the teachers compete with English and Arabic with time in the sense that by 12:00pm the Arabic instructors are standing there waiting for the teachers to leave the room so they can teach Arabic.

The practice of polygamy, linked both to Islam and to Dagomba tradition, was considered related in negative terms to access to schooling by five respondents. In one example, it was explained that the practice may leave children under the care of their mother only, who may lack the resources to provide for schooling:

> Others are irresponsible because of polygamy, the man has married four women, this one's having four children, this one's having five children and the man is a rich man by Savelugu standards but cannot support the children, now he leaves the children in the house of their mothers...so if their mother is too unable, the child will drop out of school.

Dagomba culture was also linked to gender differentials in access, particularly for fostered girls as considered in the next chapter; but also in general terms owing to duties in work, for example

> Most of our girls will not go to school for three or four days because the parents have sent them to the funeral to help washbowls and cook.

The impact of cultural pressure for girls to get married was also identified as an important gender-related factor, as illustrated in the comment of one circuit supervisor,

> Dagbon culture is that the woman should be in the marriage house and some teach that if you are not married then it means that sometimes those families will be declared useless.

Several interviewees commented on perceptions of the relevance of schooling in the district. Low levels of formal employment, the primarily academic curriculum and low levels of achievement were mentioned. One head teacher explained the issue in relation to parents' concern that formally educated children who don't reach examination standards may be unprepared for farm work, while at the same time remaining dependent on the family.

> They don't want to send the others because those who didn't pass came back and didn't want to work on the farm so they become a liability. And they say 'So why don't I start training this one on the farm so when they grow up at least they'll be accustomed to.'

*Schooling Provision*

In relation to education infrastructure, quality and enrolment levels, all interviewees noted considerable expansion in recent years. This was sometimes linked to general infrastructural improvements in the district. There was not a consensus that attitudes towards education had necessarily become more positive however. Interviewees commented on the inadequacy of school facilities, especially the lack of connection to a working electricity supply (in all but one of the schools visited) and the lack of sanitary facilities, which is linked to a lack of piped water. Water supply problems were also linked with access issues due to the responsibility of children for fetching water which in turn inhibits their access to schooling. Several head teachers commented on the poor state of buildings and the inadequacy of teacher numbers especially in connection to school overcrowding. For example

> In my school, right now there are no less than 60 – 70 students in each class. The class size should be 40. My school and other schools still sit under pavilions and trees.

All circuit supervisors explained that certain difficulties of educational supply are due to teacher salaries, travel costs and motivation issues. One mechanism whereby these factors impact on education quality is by reducing effective contact hours as a result of difficulties for teachers in commuting to work associated with high transport costs. Two interviewees mentioned teacher motivation in relation to pupil achievement, in one case also linking poor motivation in rural areas to parental disillusionment:

> Now one other reason is that some of the teachers who work in the rural areas are not committed, so the children do not pass at a decent level and the parents become demoralised.

With regard to recent policy initiatives in education, ten interviewees commented on the Capitation Grant Scheme, all of whom indicated that the scheme had brought large increases in enrolment. However, four also linked the scheme to difficulties at school and district level in raising funds following increased perceptions that public funding is adequate to meet all schooling costs. Several interviewees mentioned the positive impact of a UNICEF scheme to provide bicycles for girls in outlying areas and of World Food Programme (WFP) and Catholic Relief Services (CRS) school-feeding schemes, some of which have been scaled back in recent years. Indeed, school-feeding was considered the most effective intervention with regard to increasing enrolment by seven interviewees.

*Livelihoods and Children's Work*

With regard to livelihoods in the district in general, interviewees emphasised the persistence of poverty, but eight believed that conditions had improved in recent years, particularly regarding social services and water supply. Concerning livelihoods in farming, however, six interviewees argued that farm yields have been declining owing to the increased use of fertilizer, which has also increased input costs. Agricultural livelihoods and traditions in farming were identified in all interviews as important potential negative influences on children's access to schooling. In particular, eight interviewees explained that during periods where intensive work on family farms is required, children, especially boys, may be absent from school. For example,

> The men are mostly farmers and the land is very far away, so they have to go to where the fertile land is so it can be a challenge. So the parent goes with the boys for some period during the sowing and harvesting season. These children are carried around and sometimes they stay for a month.

While their duties are typically different, girls are also affected during these periods, as one head teacher explained:

> When they are harvesting the parents send the girls to cater for the babies while the land is being harvested. So during that time when you go to that school you go to your lessons and see that you have ten girls absent and after harvesting you

> see them again and when it is harvesting time again they will send them to the farm to support the children while they are doing the other farm work.

Girls' work was more often mentioned, however, in connection with trading and domestic chores. With regard to domestic work, this was linked explicitly by one head teacher to poor participation in schooling:

> they have to assist in the house...so their concentration in school is not that much so when they don't make it they go back to their work.

One interviewee explained that families may send a child who has previously been working at home to school once a younger child reaches an age at which he or she can replace this role. This may be a reason for late enrolment in some cases. In addition to the need for their labour, two interviewees explained that farm (and domestic) work among children is part of a wider culturally-based training system. Asked whether the work of children is a necessity with regard to the household economy, one respondent explained its importance from the point of view of 'training' rather more than labour per se,

> They could live without it [children's work] but they would like to learn in that way so they can grow up to be a farmer or a good mother.

Another connected farm work with poor progression among affected children, indicating that time lost at school impacts on ability to participate in examinations.

*Affordability of Schooling*

In around half of the interviews, the indirect costs of schooling were identified as key barriers to educational access. This is despite the apparently effective introduction of cost-reduction policies, but was most often explained in relation to indirect costs not so far alleviated by policy interventions, particularly the costs of school uniform. Nonetheless, all interviewees were clear that cost-reduction and the publicity around such policies had encouraged enrolment growth by reducing erstwhile cost barriers. For example,

> Because the parents heard that basic education is now free it is why they are pushing their children to go to school. The media has made it clear that you don't pay anything. Before it was the cost that kept them away.

Where post-basic education is concerned however, interviewees emphasised that costs remain a serious barrier. One explained the 'backwash' effect of these barriers at later stages, which may discourage earlier enrolment. Also, difficulties for households in providing food for children were mentioned as inhibiting access, in three cases by reference to a school-feeding programme previously operated by CRS. For example,

> When CRS stopped, most of the children, they don't even feel like coming. They say, 'ah if I go I will be hungry, where will I get something to eat?'

The issue of poor nutrition was raised in more general terms by one head teacher, who linked poor growth to late-enrolment,

> The age that children are supposed to come to school is 4 years old but they look like they are two, they are not ready yet, they are malnourished. They will have to wait till they are 6 or 7.

**Photograph 3: Primary school building, Savelugu-Nanton, Ghana**

Source: Fieldwork visit, March 2010

## 7.6 Discussion

Historically low levels of educational access in Savelugu-Nanton are linked to both poor supply in the form of limited schooling provision and to low demand, resulting from poverty and consequent affordability issues, to very low adult literacy, agricultural livelihoods, children's work and important dimensions of traditional culture. Since Oppong's work in the 1970s, supply-side limitations have been considerably reduced through expansion of schooling facilities. Initiatives including the Capitation Grant have also reduced demand-side barriers relating to affordability. Indeed growth in demand may have outstripped supply, as evidenced by overcrowding in some schools. Consequently, in 2009, three-quarters of primary age children were enrolled in school and an increasing number are enrolling at an appropriate age.

Significant and persistent gender disparities remain in evidence however, linked to cultural gender roles and perhaps to a very low proportion of female teachers (see EMIS data in Appendix D4). Progression rates to JSS achievement also remain low. Despite much progress, many important demand and supply side barriers remain, affecting a minority with respect to initial enrolment but a majority concerning progression. The explanations given by both the SNDA and by education professionals for low access among these groups centred on many factors cited in the earlier literature (Oppong 1966, Oppong 1973, Mahama 2004), especially children's work, particularly in agriculture, trading and *kayaye*, parental illiteracy, low incomes from agriculture, perceptions of poor relevance and cultural factors including polygamy and fosterage. Exclusion has shifted then to become more a matter largely of degree and a question of equity. Quality issues are also important in relation to poor school facilities and teacher training. On the demand side, poverty continues to be a major barrier, as evidenced by the reported impact of school feeding and by the apparent negative impact of indirect and opportunity costs. In a context of demand-constraints and of large family size but where direct costs are low and at least primary schools mostly within reach, households may send some children to school but be unable to send all, at least at the appropriate ages. In this case, it may be girls, fostered children and other disadvantaged groups whose access is most limited, as will be seen in the next chapter.

# CHAPTER EIGHT

# ACCESS DENIED? FOSTERAGE AND *KAYAYE* IN SAVELUGU-NANTON

## 8.1 Introduction

This chapter examines the practices of child fostering and of *kayaye*, a particular form of migrant labour often pursued by school drop-outs - themselves often fostered, as contributors to the particularly low levels of educational access and progress in the Savelugu-Nanton district. Fosterage was considered by every respondent in exploratory interviews with education professionals in the district to be a potential negative influence on educational access. Interviewees also linked the practice of fosterage to *kayaye* and further linked *kayaye* itself to poor educational access. They linked poor access to the decision to migrate, while at the same time migration in the form of *kayaye* largely curtails access to schooling.

The reasons for the practice of fosterage in Dagbon are complex and effects on educational access may be considered partly contingent upon both the reasons for fosterage and on individual and family circumstances. To explore these relationships in depth, this chapter begins by reviewing the limited literature on fosterage and *kayaye* in the context of Dagbon. It proceeds to report the results of quantitative analysis using available secondary data survey data. The issues identified are pursued through analysis of responses from three sets of interviews – the key informant interviews considered in the last chapter plus interviews with foster-carers and with *kayaye* labourers. The research questions addressed centre on the presentation of a descriptive picture of patterns of educational access for fostered children and on the understanding of their correlates and causes. The chapter addresses sub-question eight, which centres on the role of contextual factors including cultural beliefs and practices at the local level in

determining educational access and progression, focusing on the impact of fosterage and its relationships with *kayaye*. Addressing this question requires attention to five sub-questions as summarised in Table 8.1 below, which also identifies the sources of data employed in response to each sub-question.

**Table 8.1: Overview of research questions and data sources**

| Research Question/Data Source | GLSS | ComSS | Interviews: Education professionals | Interviews: Foster carers | Interviews: *Kayaye* labourers |
|---|---|---|---|---|---|
| 1. What is the prevalence of fostering in Ghana, the Northern Region and in Savelugu-Nanton? | • | • | • | | |
| 2. What are the key characteristics of fostered children? | • | • | | | |
| 3. What are the social, cultural and economic reasons for fostering? | | | • | • | |
| 4. What are the effects of fostering on meaningful educational access and progression? | • | • | • | • | • |
| 5. How are fosterage, its motivations and effects evolving? | | | • | • | |
| 6. What are the relationships between fosterage and *kayaye* and what are the implications for educational access? | | | • | • | • |

## 8.2 Fosterage in Dagbon

The practice and tradition of children being reared by carers other than their biological parents, including through various forms of fostering, is common in Africa generally, especially in West Africa, and in Northern Ghana and among the Dagomba particularly. DHS data from 16 African countries indicate that between 5% (Burundi) and 28% (Botswana) of children are fostered; while 15 % of households in Ghana as a whole are found to contain at least one foster child (see Akresh 2009: 977). Goody's (1973) study of the Gonja ethnic group, neighbours of the Dagomba in northern Ghana, found

that approximately 20% of children are fostered at any point in time, although many more are fostered at some time during their youth (see Zimmerman 2003:558).

Mahama (2004) explains the practices of fosterage among the Dagomba in general terms, emphasising that when children are 'fostered out', the foster parent becomes the responsible guardian where decisions regarding the child are concerned, so that biological parents are largely divested of responsibility for the child. Typically, children are fostered after the age of around 5. Boys are most often sent to paternal uncles and girls to aunts, but other relatives also act as guardians, including grandparents. Non-relatives may also be foster-parents, especially in the case of family friends who are known for being experts in a profession, or in the case of mallams who may receive children for training (Mahama 2004:146). Fostering relationships are part of wider traditions of kinship among the Dagomba, whereby upbringing and socialisation of children takes place in the context of extended family networks. Extended families are organised around patrilineal relationships, as Oppong explains,

> Dagomba say that children cannot be taken to the father's side because they are already there and there is no term for fostering by the paternal relatives, nevertheless it is axiomatic that sons should be given to their father's sisters so that they will be stricter in rearing them and will not spoil them.
>
> (Oppong 1977:14)

Accordingly, the concept of fosterage simply as rearing by non-biological parents does not find a ready equivalent in Dagomba culture. In accordance with patrilineal inheritance, custody of children is also patrilineal. In the absence of the father, the father's family takes care of a child, except that it is customary for a child to remain with its mother until weaned or until around five years old (Mahama 2004:120-1). Children are usually given to the custody of the father, his sister or mother in the event of divorce or of the mother's death, whereas children 'fostered' to the mother, typically by her brother remain 'hers'. Indeed the mother and her blood relatives may be argued to have more influence in directing the upbringing, schooling and work of these (foster) children, with potential implications for the schooling of fostered, when compared to biological children. Moreover, particular roles in the upbringing of children are often exercised by close relatives of parents. A child's 'social parents' according to Dagbon tradition are often paternal or maternal relatives who have exercised a customary 'right' to raise and train children, often their nieces and nephews. These customary rights may differ according to professional group and personal circumstances (see Oppong

1973:43-44). According to custom, the 'claim' of a relative over a child may be strong, particularly in the case of the father's sister whose request "to take a daughter can scarcely be denied because of her influential position in the family" (Oppong 1973:45). Notably, when a girl has been fostered by her father's sister it is to her that the girl's suitors will pay their respects.

While fostering relationships are most often close family relationships which serve a number of possible functions as discussed below, it is clear that one aspect of the relationship consists in providing children to 'serve' or work as well as to be trained, particularly in domestic labour and in agriculture. In this regard, the Dagomba may be considered to perceive the fostering of a child in part an 'opportunity' for the acquisition of an 'asset'. Abukari explains that when a girl is fostered, most often to an aunt or grandmother, it is often said in traditional parlance that the child is given "so that she can fetch water" (Abukari 2008). In Abukari's view, the fact that the child is in some sense regarded as a 'gift' in part explains why foster children may be treated as 'assets', why some biological parents do not follow-up closely on the children's treatment and why some foster parents prefer to keep foster children at home for domestic work or to send them out to work in farming or petty trading (Abukari 2008). In relation to the Gonja of Northern Ghana who also practise fostering widely, Goody describes the obligations of the foster-child by way of a 'debt' payable to the foster parent in return for their upbringing. Among the Gonja, the services offered by the foster parent in terms of care, support and training build an obligation which the child must repay; described in Goody's terms as part of the 'reciprocities of rearing' (Goody 1973).

However, it is customary for all Dagomba children to work in the household or farm, so that no clear-cut distinction may be drawn between the roles of fostered and biological children. The distinctive occupational aspect of fosterage is perhaps most clearly demonstrated in regard to the traditional Dagbon professions. In these cases, the practices of fostering were historically well-defined. Although still in existence, these professions are found currently to be somewhat in decline. Such children may be reared and trained by foster or adoptive parents under several kinds of arrangement. Historically, for example, traditional drummers were selected through divination and fostered in order to learn the art in a practice termed Zuguliem (Oppong 1973:47-8). Another traditional practice, termed Talma, involved the 'pawning' of children as

'collateral' to serve distant and wealthy relatives in return for money, especially when competing for 'skins' or traditional titles (see Abukari 2008).

The cultural importance of fostering traditions in Dagbon is underlined by the ceremonial practices that surround them. Abukari considers the case of fostering a daughter to a father's sister and explains that fostering would often follow the 'betrothal' by a man of one of his wives to one of his 'sisters' (including cousins) at the time of his marriage. This 'betrothal' means that the sister would be chosen to undertake certain rituals during the man's wife's pregnancy, would perform an 'outdooring' ceremony upon the child's birth, and, should the child be a girl, would foster the child once it was weaned (Abukari 2008).

While the traditions of fostering may not be fully understood by way of functional analysis; since they reflect a wider conception of kinship and identity, it is useful to consider the functions cited in the literature in relation to the potential impacts of fosterage on educational access and attainment. Oppong (1973:48-9) summarises these functions in terms of kinship solidarity, responsible parenting; the distribution of wealth, knowledge and prestige; and the distribution of child-rearing responsibilities and of child-labour. In respect of the first, fosterage plays a part in knitting the family together more closely, because children come to know their relatives better and adults are linked together by rearing each other's children. Secondly, foster-parents may be considered more mature and experienced than the biological parents, and consequently more capable guardians, including because they may be less apt to 'spoil' or 'pamper' the child. Abukari explains this motivation for fosterage, emphasising discipline, development of personal qualities and the development of Dagbon citizenship:

> The contention was that fostered children tended to develop into better citizens capable of withstanding odds and hardships and worthy of social respect than children raised by their biological parents. (Abukari 2008)

Oppong concurs, writing that "indeed parents are not even thought to be the best or most competent people to bring up their children and should not keep all of them." (Oppong 1973:44). With regard to the distribution of wealth, fosterage serves to redistribute the wealth of richer adult family members, since they help to rear their siblings' children. As well as redistributing wealth, knowledge and prestige are also shared in this way, especially where a sibling is a mallam, teacher, chief or professional.

Concerning the role of fosterage in redistributing both the responsibilities and benefits (in terms of child labour) of child-rearing, Oppong explains that traditionally, the services of children were very valuable to foster parents, particularly otherwise childless adults, for the purposes of performing essential tasks such as fetching water and running errands; and on the farm, including caring for livestock and scaring birds. Moreover, she argues that the "household which has no child labour is not really economically and domestically viable" (Oppong 1973:48), because of the tasks normally allocated to children, which relieve the adults and allow them to undertake other work.

A further role played by a fostered child when living with maternal relatives is as 'replacement' for the mother. As well as being a means whereby the foster child's siblings maintain contact with their maternal kin; in the cases of certain professional groups, recruitment to the group is served by replacing women who marry out with one or more of their children or grandchildren. Mahama (2004) explains a similar function of fosterage in that it serves to unite the maternal and paternal sides of an extended family. For example, it is customary that when a man gives his daughter in marriage, the husband may then return a child to his wife's father's home. Oppong presents a diagrammatic representation of fosterage relationships in Dagbon, reproduced in Figure 8.1 below, which illustrates the role fostering plays in strengthening kinship ties between siblings and lines of maternal and paternal descent.

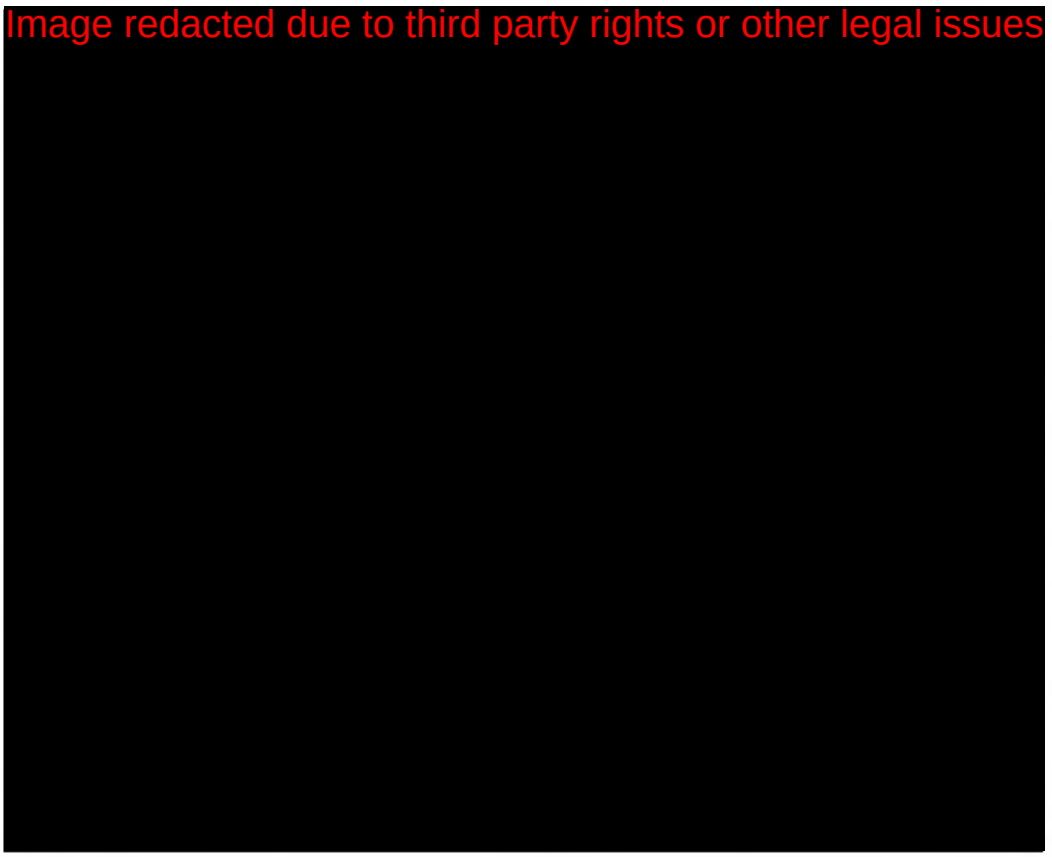
The father in kindred C has, for illustrative purposes, a daughter and a son. The daughter has three children with a member of kindred D, two girls and a boy. One girl is fostered to her sister-in-law and a boy to her brother as represented by the dotted diagonal lines. Her husband fosters a boy from his sister and she fosters a girl from her brother so that there are three children living with her, one biological daughter, one fostered boy from the father's side and one girl from the mother's side. In this way, solidarity between the woman and her own natal home (especially her siblings) is enhanced and links are forged between her and her husband's siblings and thereby between the two kindreds C and D.

Turning to the role of fosterage in the redistribution of children, Abukari states that

> When a couple was blessed with several children, the woman's family could send an appeal to foster one of the children (usually the youngest)...Fathers preferred giving out girls even if a boy was the youngest. (Abukari 2008)

Two specific cases of fostering for the purposes of redistribution of children stand out. The first case concerns the event of a relative's, or particularly a mother's death, when young children would typically be fostered by other family members, described by Goody (1975) as 'crisis fostering' while the second concerns the relief of the 'plight' of infertile women. Childless women, whether through infertility or other reasons including child mortality, are considered particularly worthy of receiving children through fostering in Dagbon.

**Figure 8.1: Fostering Relationships and Kinship among the Dagomba**




Source: Oppong (1977:16)

A number of differences in both the prevalence and traditions of fostering in relation to boy and girl children have been mentioned already. While no representative statistics are available on fosterage by gender in Dagbon or Savelugu-Nanton, culture and tradition suggest that not only are girls more often fostered but that there may be greater implications for both work and education. Abukari argues that

> Whether fostered by an aunt, a sister or a grandmother, girls were generally over taxed. They were always the last to go to bed in the night and the first to wake up at dawn. Their activities included sweeping, fetching water, cutting and

> carrying fuel wood, performing a host of household chores, picking shea nuts and harvesting crops. (Abukari 2008)

In addition, the requirements of marriage for girls in Dagbon may place greater pressure on fostered girls. Abukari explains that traditionally, girls of marriageable age acquire certain items or property to be taken to the marital home, and that where foster-parents are less able or willing to assist than their biological counterparts, girls may experience greater pressure to enter paid work. The items concerned can include wax prints, veils, head gear, bowls, buckets, pots, cooking utensils, hand bags, suitcases and sandals, among others (Abukari 2008).

### 8.3 Fosterage and Schooling

The relationships between fostering and children's schooling and work are ambivalent, complex and varied. With regard to schooling, for some children, fosterage may be intended to improve educational opportunity, while for others it may prevent or inhibit enrolment (Pilon 2003:4). Pilon argues that the nature of relationships between the family of origin and the host family are key, centring on who pays for the children's upkeep and schooling costs and on the extent of authority, responsibility and affection in host family relationships. He points out that

> Actual situations are highly diverse. It is likely that the lower family of origin's involvement, especially financially (or in kind), the higher the risk that the foster child will suffer mistreatment in the host family (Pilon 2003:19)

Becker's (1991) approach to family resource allocation suggests that part of the economic disadvantage experienced by foster children may be due to their weaker genetic connection with guardians when compared to biological children – a "Cinderella effect" (Zimmerman 2003:561). With regard to access to education, this effect may operate through a number of mechanisms. In low-income contexts, even where adequate supply exists, households may be constrained from providing education for all children, or for all children equally, since a major barrier to achieving universal enrolment in basic education consists in the costs of schooling, be they direct, indirect or opportunity costs in terms of foregone earnings - in money or in kind from child labour. Moreover, some forms of work, such as cattle herding, are more antithetical to schooling than others. Further, households may employ a somewhat collectivist rationale in deciding whom to educate and to what level, with a focus on diversifying

family income sources and maintaining traditional divisions of labour in domestic and agricultural work. Oppong comments:

> Even a man who has been educated himself will say "Some boys must go to school, others herd cattle, others cut grass. (Oppong 1966:23)

While economists typically focus on economic motivations for fostering such as income, labour supply and resource allocation, anthropologists often emphasise kin obligations and traditions. Combining insights from both traditions, Isiugo-Abanihe (1985) identifies four major motives for fostering children in the West African context. It might be expected that these would have rather different impacts on children's schooling access and outcomes. Firstly, fostering may be motivated by a wish to improve a child's social mobility and opportunity, including by improving access to schooling. This motive may be considered the most consistent with 'human capital investment'. Secondly, it may be to manage an economic shock to the biological home such as a death. Thirdly, it may be to satisfy the labour needs of the recipient household. Finally, it may be primarily to meet kinship obligations and rights. In the first and second cases it may be expected that fostering could, potentially at least, improve the access to education of the fostered child relative to remaining in the biological home. In the third it may be that fostering reduces the fostered child's access to education relative to her siblings, while in the fourth the outcome is more ambiguous and depends on the nature of kinship obligations. Moreover, sending and receiving households will typically differ not only in their resources and liquidity constraints but also in their preferences for education, among other factors (see Marazyan 2009).

Based on a study in Ghana's neighbour Cote D'Ivoire De Vreyer notes that education expenses earmarked for foster children are typically lower than those allotted to the household head's own children (De Vreyer 1994). In the context of Senegal, Vandermeersch remarks that

> Sometimes these children are less well-fed and work more than the others in the household, under the pretext of giving them a good upbringing...these children are practically thought of as domestic servants, and that can only have a negative influence on their scholastic performance. (Vandermeersch, 2000:431)

Pilon contends that "their chances of repeating, failing and dropping out are higher. This reality involves boys as well as girls, but the problem is assuredly more acute for girls, who are requested to perform more domestic chores" (Pilon 2003:19). Further,

Marazyan (2009:24) found that in Cameroon fostering takes place mainly because of kinship obligations and not because host families are better able to care for the children they receive; and that consequently, the presence of foster children in a household may tighten liquidity constraints, reducing the ability of the parents to pursue their biological children's education, indicating that fostering may also impact negatively on the education of biological children.

Nonetheless, effects of fosterage vary by context, and in South Africa, Zimmerman found that because fostering is not strongly associated with domestic labour and often means children moving to families more able or more apt to send them to school, fostered children are more likely to attend in that country (Zimmerman 2003:558). Zimmerman also notes, however, that in the context of Cote D'Ivoire, Ainsworth (1996) reaches a quite different conclusion using a similar approach, finding that the demand for domestic labour is a key motivation for fosterage, with negative consequences for school enrolment. The dominant reasons for fosterage are thus an important determinant of its effects. The international literature typically emphasises the negative consequences of fosterage on children's education and welfare (for example Haddad and Hoddinott 1994, UNICEF 1999), associating it with child labour, while acknowledging that fosterage is also sometimes practiced to improve educational opportunities (see Akresh 2009). This is illustrated by Akresh with a policy-oriented example from the UN Committee on the Rights of the Child report (2002):

> The committee recommends that [Burkina Faso] urgently take all measures necessary to put a stop to the practice of "fostering" and "traditional adoption" (cited in Akresh 2009:977)

In his own empirical modelling using data from Burkina Faso, Akresh (2009) found that households experiencing negative income shocks are more likely to foster children 'out' (send them); those with more biological girls than boys are more likely to foster a girl out and those further from a primary school are more likely to foster out and less likely to foster children 'in' (receive them). Also, households with 'better' extended family networks in terms of more educated and better-off relatives were found to be more likely to foster out. Related work by Akresh also in Burkina Faso found these children are not disadvantaged in terms of school enrolment (Akresh 2007). These findings thus cast some doubt on the policy recommendation above and emphasise the complexity and contextuality of the practices and their effects.

In the context of Ghana as a whole, it was shown in Chapter 5 that when compared to biological children of the household head, other relatives of school age (excluding grandchildren) were 7% less likely to have ever attended school and had a relative likelihood only 28% of that of a biological son or daughter of the household head of completing primary school and of 19% where completing secondary school was concerned. In relation to higher levels of basic access especially then, fosterage appears in Ghana as a whole to be associated with notably lower access levels.

*Fosterage and Schooling in Dagbon*

The traditions of fosterage and their functions in Dagbon are not readily separable, while the effects of fosterage on schooling are highly contingent. Moreover, it is clear that fosterage traditions, their effects and functions are evolving owing to cultural dynamics which are interlinked with rapid social, demographic and economic change, including the coming of mass education. An important reason for lower levels of educational access among fostered children in Dagbon, as elsewhere, consists in the differences that may exist between the expectations of fostered and biological children in terms of work. To cite a historical example,

> an educated civil servant had 'fostered' four of his senior brothers' sons and sent them to school as well as sending five of his own thirteen children, but two of his own sons fostered by his elder brother had been kept at home to act as grooms and grass cutters. Their foster father would not let them go to school in spite of their father's protestations (Oppong 1966:23)

The role of relatives other than parents in children's upbringing in Dagbon has the implication that parental influence in the direction of a child's education and career may be more limited than in some other cultures. While some families do send children to live with relatives (particularly in urban areas) for the purposes of better access to formal schooling in Dagbon, the literature does not suggest this to be a dominant reason for fosterage. Oppong argues, however, that fosterage for the purpose of access to schooling was notable in the early years of state education, when distances to school were often long. Children, most often boys, would be fostered to relatives living in towns, especially the regional capital Tamale and while living in town, the boys would perform domestic chores in teachers' or clerks' households in return for a place to stay (Oppong 1973:70). This practice had much in common with the more traditional form of fosterage whereby children were sent away to learn trades. At the basic level at

least, however, travelling distances to school in Dagbon are now considerably reduced, largely eliminating the need for fosterage purely to facilitate access to basic education.

Kinship obligations connected with labour needs along with crisis-fostering may be considered more persuasive explanations for fostering, particularly given the historically low levels of participation in schooling among the Dagomba. Whatever the motivation, fosterage may present a significant financial burden to the receiving household and as a result, owing to differences in status and role it may be that fostered children lose out in educational access terms. Nonetheless, it should be noted that the practices of fosterage in Dagbon are associated with a number of other relevant phenomena, particularly those connected to adherence to traditional culture and consequently to education preferences, but also relating to poverty, family size and so on. Few detailed studies have been conducted on fosterage and access to education and the author is not aware of any recent study in the context of Dagbon, with the exception of Abukari's (2008) unpublished work on fostered girls discussed below.

*Fostered Girls and Education in Savelugu-Nanton*

Abukari explains that one reason for a greater impact of fostering upon girls' education in Dagbon may be that these girls are typically fostered by women; and that men, who are most often the household heads, may not regard these girls as part of their responsibility in respect of meeting schooling costs:

> The reason is that, the man of the house may not be financially endowed or he may be simply unwilling to take on the additional responsibility of educating his wife's foster children; at the same time, he is not in a position (since the foster children are not directly related to him) to prevail on his wife to send them to school. (Abukari 2008)

In addition, foster mothers may expect more of fostered girls in respect of work, while at the same time, the importance of the foster parent's obligations with respect to preparation for marriage may take precedence over schooling. According to Abukari (2008) and in relation to the obligations of a foster-mother, "even in modern times, education plays second fiddle to the concept of proper marriage" (Abukari 2008).

Abukari (2008) argues that when very young, the opportunity costs of sending fostered girls to school may be somewhat lower than subsequently, when at the age of around nine and upwards the girl's potential contribution in terms of labour increases. It is at

this point that difficulties may surface for girls who have already begun schooling. There may be a decline in both attendance and performance at school, when it is suggested that "unsuspecting teachers vent their anger on the unfortunate girl, thus paving a way for an inevitable drop out" (Abukari 2008). However, it is in adolescence that the demand for the girls' labour may increase most significantly. Abukari continues, "this is the period foster parents grossly disregard girls' education with impunity and send them out to other villages to gather shea-nuts, harvest groundnuts, maize, guinea-corn and rice and in recent times, coerce them to travel down south to engage in the head porter business popularly known as *kayaye*" (Abukari 2008).

Abukari undertook a study of fosterage of girls in three primary schools and two junior secondary schools in Savelugu township in 2008. Using a survey questionnaire, he collected data on with whom the 383 girls selected schools lived. The results are summarised in Tables 8.2 to 8.5 below. Examining school enrolments across the sampled schools, he found that approximately two thirds of pupils enrolled at both primary and JSS levels were boys. It is important to note that his study began by identifying girls at school and hence does not consider the potentially large number of fostered girls who are 'out of school' and results should be interpreted conditional on this selection. As shown in Table 8.2, he found that typically between a third and a half of girls in the sample were fostered i.e. living with neither of their biological parents. Most often they were fostered to an aunt, but fostering to a grandmother was also common. Excluding fosterage by grandparents, Abukari found that 26% of the total sample of girls was fostered. Rates of fosterage were high in the English-Arabic schools shown in italics in Table 8.2 (all of the sample except JSS D). Rates were slightly higher at primary than JSS level, although as the sample is small it cannot be concluded that this is due to, although it is consistent with, a higher prevalence of drop-out among fostered girls.

Abukari asked a small sample of biological fathers questions in relation to their own and their foster children's education and work, to the number of children they had living in foster homes and to who provides school uniform for fostered children. He asked a small sample of fostered girls about their schooling and work and about their foster relationships. With a small survey of teachers, he asked about perceptions of educational performance of fostered girls. In each case the sample numbered twenty individuals. The results are summarized in Tables 8.3 to 8.5 below. Clearly the

samples are small and the results not generalisable, but may be considered illustrative of the issues investigated.

**Table 8.2: With Whom Schoolgirls in Five Schools Savelugu-Nanton Lived (%)**

| School[17] | Living with | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Biological Parents | | | Foster Parents | | | Total | % Fostered |
| | Both parents | Mother only | Father only | Grand-mother | Sister | Aunt | | |
| **Primary A** | 22 | 6 | 0 | 12 | 1 | 4 | 45 | 37.8 |
| **Primary B** | 18 | 2 | 0 | 4 | 1 | 22 | 47 | 57.4 |
| **Primary C** | 42 | 7 | 1 | 16 | 2 | 20 | 88 | 45.6 |
| **All Primary** | 82 | 15 | 1 | 32 | 4 | 46 | 180 | 45.0 |
| **JSS D** | 27 | 4 | 0 | 17 | 2 | 30 | 151 | 32.5 |
| **JSS B** | 22 | 3 | 0 | 8 | 3 | 16 | 52 | 43.3 |
| **All JSS** | 93 | 20 | 2 | 25 | 5 | 46 | 203 | 37.4 |
| **Total** | 175 | 35 | 3 | 57 | 9 | 92 | 383 | 41.3 |

Source: Abukari (2008)

Table 8.3 shows that the vast majority of biological parents surveyed were illiterate. More than half had two or more of their children in foster homes and around two-thirds visited them less than once a month, with a quarter never visiting at all. Most received no reports of how the children were treated. The provision of school uniforms was found to be the responsibility of foster parents in the vast majority of cases. When the question of contributions to education was asked in more detail, just less than half of biological parents said they gave some form of assistance, including by helping with food or school material costs (see Abukari 2008).

Table 8.4 shows that the majority of foster parents were also illiterate and also finds that the provision of school uniforms fell to the foster parent in the vast majority of cases. Two thirds of fostered girls were found to assist in their foster parents' businesses, with most of those being involved in selling wares. 15% of these foster parents also looked after other foster children who were not attending school. In these cases foster parents said the children helped with chores and childcare (see Abukari 2008).

[17] School names anonymised

When the girls themselves were questioned, two-thirds stated that the work they do for their foster parents interfered with their schooling. Among these, several said it affected their punctuality while others said it meant they had insufficient time for homework or that it affected their attendance. As shown in Table 8.5, just over half of teachers indicated that fostered girls' performance at school compared unfavourably with their peers living with biological parents, although none rated it as poor. They attributed disparities in performance to irregular attendance, lack of study at home and inadequate school equipment.

**Table 8.3: Summary of Results of Questionnaire to Biological Parents (%)**

| Literacy | Children in foster homes | | | Visits to children in foster homes | | | | | Provision of school uniforms | | Reports of how fostered children are treated | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Illiterate | 1 | 2 | >2 | Weekly | Monthly | Bi-monthly | Ann-ually | never | Bio-logical | Foster | Yes | No |
| 95 | 40 | 40 | 20 | 5 | 30 | 35 | 5 | 25 | 10 | 90 | 15 | 85 |

N=20 Source: Adapted from Abukari (2008)

**Table 8.4: Summary of Results of Questionnaire to Foster Parents (%)**

| Literacy | Provision of school uniforms | | Foster children's participation in business | | Activities undertaken by foster children assisting in business | | | Household has other foster children not in school |
|---|---|---|---|---|---|---|---|---|
| Illiterate | Biological | Foster | Assist | Don't assist | Selling wares | Carrying Goods to market | farming | |
| 75 | 10 | 90 | 65 | 35 | 77 | 15 | 8 | 15 |

N=20 Source: Adapted from Abukari (2008)

**Table 8.5: Summary of Results of Questionnaire to Teachers of Fostered Girls (%)**

| Performance of fostered girls at school | | | | Comparison of performance of fostered girls to those living with both biological parents | | | Reasons for relatively poor performance where this was cited | | |
|---|---|---|---|---|---|---|---|---|---|
| Very good | good | fair | poor | Better | Equal | Worse | Poor attendance | Lack of time to study | Lack of materials |
| 5 | 50 | 40 | 0 | 15 | 30 | 55 | 27 | 53 | 13 |

N=20 Source: Adapted from Abukari (2008)

Abukari's study points then, to notable disadvantages in relation to schooling access and performance among fostered girls. Moreover, the literature on fosterage in Dagbon more generally suggests that fosterage is not practiced primarily to improve educational opportunities and that the work commitments and status within the household of fostered children, as well as the relationships between and expectations of their natal and foster-homes may affect their educational access negatively. The apparent link between fosterage and a tendency for youths to migrate into *kayaye* may serve to exacerbate the disadvantage as discussed in the next section.

### 8.4 *Kayaye*

*Kayaye* or literally 'head-porterage' is a form of migrant labour whereby youths, mostly from northern Ghana and often girls, carry loads for small rewards at markets and transport stations in Ghana's southern cities. The term is also used more generally to refer to other common forms of menial and unskilled labour carried out by young migrants from the North to the urban centres, including scrap-dealing, mostly undertaken by boys, along with various forms of petty-trading undertaken by both sexes. In relation to *kayaye* in the narrow sense, Di Campo explains the pattern of work typically undertaken by migrant girls:

> The girls rise early each morning and spend long hours waiting in a market or on a street corner, hoping to find someone who needs them to transport their purchased goods or personal belongings. The loads they carry on their heads are heavy and enormous: head pans full of tomatoes or yams, or a traveller's bursting suitcase. (Di Campo 2009)

The trend for young adults to migrate from the economically poorer northern regions, particularly to the Southern cities of Accra and Kumasi may be traced back to pre-independence times. However, there is some suggestion that the phenomenon may have been increasing in recent years, for a number of reasons. In relation to north-south migration generally, Braimah and Obeng-Nti (2009:57) argue that unemployment in the North has compounded the problems in urban centres caused by migration by prompting more and more young people to 'seek a better life' away from the rural North. In addition to the perception of greater opportunity, communications including road transport, internet, television and mobile telephony have increased dramatically in the last decade or more, making both migration and contact with family at home considerably easier and bringing greater awareness of differences in lifestyles.

Nonetheless, in recent years access to education in the North has improved dramatically so that issues of education supply per se are not a likely explanation for any apparent increase in migration. Arguably, in recent times, it is rather low levels of access to schooling by comparison with their peers that may be the key educational factor where going to *kayaye* is concerned. The 'push' factors associated with poor educational access, quality and performance combined with 'push' factors in the household, including poverty and hardship in domestic or farm work appear to be associated with the decision to migrate. For foster children and especially fostered girls, household 'push' factors may be stronger and there may be an additional relative 'push' due to unequal treatment by foster families when compared to biological children. Moreover, the 'pull' factors associated with income-earning through *kayaye* may be especially important where fostered children and especially fostered girls of marriageable age are concerned. In Abukari's (2008) view,

> Most of the northern girls parading the streets of Accra, Kumasi and other southern cities are fostered children who are struggling to acquire property to aid their foster parents in their efforts to adequately marry them off. (Abukari 2008)

More generally, economic independence, higher living standards and the ability to accumulate assets are among the 'pull' factors that motivate migrants to leave home. In recent years both the 'push' and 'pull' factors with regard to migration have arguably strengthened, for reasons including widening economic inequality associated with relatively better economic development in the South, declining agricultural productivity, rapid population growth in the North and also greater awareness of lifestyles outside of the region, perhaps also associated with dissatisfaction among youth regarding traditional roles in domestic work and agriculture and with the conditions in foster homes. Di Campo summarises some of the reasons behind the *kayaye* phenomenon:

> While some are forced by their families to go and help increase the household's earnings, others travel willingly, hoping to escape arranged marriages or the north's severe lack of employment. Many work seasonally, returning home annually to help harvest on family farms, and many, drawn to an appearance of becoming more modern, stay on in the cities... They are at the center of a cycle of poverty, from a region known for poor education and infrastructure and infertile land, and they are trying to escape. (Di Campo 2009)

While little evidence is available on the prevalence of migration for *kayaye*, the apparent increase in the phenomenon indicated in the interviews that follow may be considered an illustration of dynamic interaction between culture and social and

economic change in northern Ghana and especially in Dagbon. There are clearly important linkages between schooling access, fosterage, poverty and migration to *kayaye* and it is evident that the nature of *kayaye* work, most often conducted far from the youth's natal home is such that it is very difficult to combine with formal schooling.

### 8.5 Approach and Methods

The research questions outlined in Section 8.1 are addressed by means of three sets of analysis in the sections that follow. Firstly, analysis is conducted using GLSS 5 to examine the prevalence of fosterage and its association with schooling access and attainment, focused on the Northern region of Ghana. Secondly, CREATE ComSS data from Savelugu-Nanton district are examined to explore the relationships between fostering and a number of aspects of educational access. Finally, the results of three sets of interviews are explored, firstly the exploratory interviews with education professionals in the district, followed by two sets of interviews addressing the issues of fosterage (with foster carers) and *kayaye* (with *kayaye* migrants) directly and in detail. Semi-structured interviews were conducted with foster carers at their households and with *kayaye* workers at work in April-June 2010. The interview schedules are included in Appendix E3 and E5.

Interviews with foster carers focused directly on fosterage, centring on the reasons for and functions of fosterage and their relationships to educational access. The selection of foster carers for interview was based on data from the ComSS. Sampling was purposive in that the selection of households was made from rural areas where fosterage is known to be common and where traditions of fosterage may be stronger. Households containing at least one fostered child were identified and eighteen were then selected at random using the CommSS household list after identifying households with fostered boys and fostered girls within three rural communities – E, F and G. Prior to interview, household caregivers completed a background questionnaire which collected data on the caregiver's age, gender and education and on the number, ages, school status and relationships to the caregiver for all children in the household.

Interviews with *kayaye* migrants were conducted at Agbogbloshie market in Accra, focusing on schooling experiences, reasons for dropping out of school and reasons for migration. The market is an important trading venue which has a high density of

migrants from the North among its workforce. It was intended that if possible *kayaye* workers originally from the Savelugu-Nanton district or its close surroundings would form the sample of interviewees. With the assistance of two circuit supervisors from the district and from the workers themselves, it was possible to identify twelve migrants from Savelugu-Nanton and the neighbouring Tolon-Kumbungu district, a rural and predominantly Dagomba district with much in common with Savelugu-Nanton. The age group targeted was 14-21 to reflect relatively recent educational experience. A background questionnaire was completed before commencing the interview (included in Appendix E4).

Both sets of interviews were conducted in Dagbani in the presence of an English translator.

### 8.6 Fosterage in GLSS (Ghana Living Standards Survey) Data

Table 8.6 below summarizes the relationships of children to their household head by region in Ghana using data from GLSS 5. Typically, around three quarters of children are the biological children of the head and eleven per cent are grandchildren. The prevalence of fosterage may be estimated based on the proportion of other children in the household which ranges from around 8 to 15%, averaging at and around 12% nationally and being around 11% in the Northern Region. While grandchildren living without their parents may be considered fostered, in many cases they live with both a parent and the household head, so are not treated as fostered for this analysis. Table 8.7 shows the ever-attendance at school rates in the 6-18 age-group for the Northern Region specifically, according to gender and relationship to the household head, excluding servants and other non-relatives where numbers are very small in the region. In this case, 45% of fostered girls and 57% of fostered boys had ever attended as compared to 51% and 62% of biological children and 61% and 80% of grandchildren respectively, indicating a discernible gap between fostered and non-fostered children's ever-enrolment.

Table 8.8 compares key characteristics of fostered with non-fostered children in the Northern region (columns 1 and 2). Fewer fostered children had ever attended school or were currently attending at the time of the survey and the difference between ever and current attendance rates – indicating the prevalence of drop-out was twice as high for

fostered children – a gap of 8 compared to 4 percentage points. Perhaps surprisingly, fostered children lived on average in slightly smaller households with higher levels of welfare in terms of per capita consumption spending. Although on average their biological parents had received less schooling and fostered children worked more hours than non-fostered children, these differences were not significant. Expenditure on schooling for both types of children was similar.

**Table 8.6: Relationships of Children aged 6-18 to the Household Head (2005/6) (%)**

| Region | Biological Child | Grand child | Other relative | Servant | Other non-relative | Total |
|---|---|---|---|---|---|---|
| Western | 76.32 | 10.75 | 9.82 | 0.49 | 2.62 | 100.00 |
| Central | 74.27 | 14.96 | 9.21 | 0.11 | 1.46 | 100.00 |
| Greater Accra | 76.53 | 8.55 | 11.39 | 1.42 | 2.11 | 100.00 |
| Volta | 74.92 | 13.77 | 9.43 | 0.24 | 1.65 | 100.00 |
| Eastern | 72.40 | 15.24 | 9.98 | 0.24 | 2.15 | 100.00 |
| Ashanti | 73.53 | 14.34 | 9.58 | 0.46 | 2.09 | 100.00 |
| Brong Ahafo | 76.82 | 9.81 | 11.81 | 0.24 | 1.32 | 100.00 |
| Northern | 86.21 | 3.25 | 9.51 | 0.17 | 0.86 | 100.00 |
| Upper East | 85.22 | 6.96 | 6.96 | 0.06 | 0.79 | 100.00 |
| Upper West | 80.73 | 6.30 | 11.97 | 0.14 | 0.86 | 100.00 |
| Total | 76.85 | 11.02 | 10.02 | 0.40 | 1.70 | 100.00 |

Source: Author's calculations from GLSS 5

**Table 8.7: Ever-attendance rates of Children aged 6-18 in the Northern Region of Ghana by Relationship to the Household Head and by Gender (Proportions)**

| Relationship to head of household | Sex of individual | | |
|---|---|---|---|
| | Female | Male | Total |
| Child | 0.510 | 0.617 | 0.569 |
| Grandchild | 0.614 | 0.789 | 0.684 |
| Other relative | 0.450 | 0.566 | 0.506 |
| Total | 0.506 | 0.616 | 0.565 |

Source: Computed from GLSS 5

Columns 4 and 5 in Table 8.8 separate non-fostered children into those living in homes which contained a foster child (termed 'foster households') and those living in homes which did not. The findings here show that differences between fostered children and non-fostered children not living in foster homes are fairly small. However, non-foster children living in foster homes showed considerably higher ever and current attendance

rates at school and higher levels of parental education; and also received higher levels of schooling expenditure. In fact schooling expenditure and parental education was found to be approximately twice that of non-foster children in non-foster homes. Columns 6 and 7 compare foster and non-foster households, showing that welfare and the level of education of the household head is lower in non-foster homes, as is household size and the number of school-age children.

**Table 8.8: Characteristics of fostered/non-fostered children aged 6-18 and foster /non-foster households in the Northern Region of Ghana (2005/6)**

| | Non-Fostered Child (1) | Fostered Child (2) | t-test sig at 5% (3) | Non-Fostered Child in: Foster HH (4) | Non-Foster HH (5) |
|---|---|---|---|---|---|
| **Child level** | | | | | |
| Ever attended school (propn.) | 0.59 | 0.53 | Yes | 0.72 | 0.57 |
| Currently attending (propn) | 0.55 | 0.45 | Yes | 0.66 | 0.53 |
| Mother's education (mean yrs) | 0.70 | 0.44 | No | 1.38 | 0.60 |
| Father's education (mean yrs) | 1.36 | 0.97 | No | 2.44 | 1.20 |
| Mean hours worked (per week) | 9.90 | 10.82 | No | 8.39 | 10.11 |
| Mean household welfare[18] (1999 Cedis) | 702,929 | 871,048 | Yes | 706,733 | 702,390 |
| Mean household size | 8.73 | 7.66 | Yes | 11.25 | 8.37 |
| Mean schooling expenses (1999 Cedis) | 218724 | 198164 | No | 307281 | 164447 |
| **Household level** | **Non-Foster HH (6)** | | **Foster HH (7)** | | |
| Mean Household welfare (1999 Cedis) | 825,473 | | 967,554 | | |
| H'hold head ed. (mean yrs) | 1.71 | | 2.62 | | |
| Household size (mean) | 6.73 | | 7.23 | | |
| School-age children (mean) | 2.67 | | 3.17 | | |

N=1500 Source: Computed from GLSS 5

Table A8.9 (Appendix A) shows the results of a probability analysis for the exploration of factors associated with ever-attendance at school for household members in the 6-19 age group reported by region. Variables are included for household composition factors, region, parents' education and household head's occupational sector. The association with male gender is much larger in the Northern region than elsewhere. The correlations with household level factors including welfare, socio-economic status (household head's employment sector), and the household head's gender are greater in the Northern region, as is the association with parental education. When examining the association between a child's relationship to the household head, the status of

[18] Annual household per capita (equivalent adults) expenditure at Accra prices

'biological child of the household head' is used as the reference category. Fostered children mostly fall into the category 'other relative of head'. In the presence of the full set of variables, when compared to a biological child, a foster child's probability of ever attending school is lower at the ninety per cent confidence level in four regions – Northern, Upper East, Brong Ahafo and Ashanti. In the Northern region, being fostered is associated with a 19% lower probability of ever having attended other things being equal, second only to a twenty percent difference in the Ashanti region. Because variables are included for household welfare, size, proportions of young children in the household, socio-economic group, region, urban location and sex of the household head, the fostering co-efficients may be interpreted as net of the effects of these factors, while it should not be interpreted necessarily as a causal effect since fosterage is also associated with a range of unobserved cultural and economic factors.

The association between ever-attendance and fosterage is notably larger than the association with gender in the Northern region, the region which nonetheless has the highest levels of gender gap in educational access in Ghana. More specifically, being fostered is associated with a reduced probability of ever attending school by more than twice as much as the effect of being female. When the exercise was run separately for the sample of boys and girls in the Northern region, the fostering co-efficient was found to be -0.238 for boys and -0.152 for girls. This suggests that while boys are otherwise more likely to attend, the apparent effect of fostering is greater for boys than for girls to the extent that these associations are counterbalancing; and fostered girls and boys have almost equal likelihoods of attending, other things equal. This appears to suggest that the influence of other factors than fostering is greater in the case of the ever-attendance of girls. Indeed the separate estimates for boys and girls also indicated significant effects of socio-economic groupings for girls only; and larger effects of parental education in the case of girls than of boys.

In order to examine the difference in odds of ever attending school between fostered and non-fostered children within the same household, a household fixed effects logistic regression model was used with the sample of households which contained more than one child and in which there was variation among the children on ever-attendance – 730 households out of 5147. Taking account of sex and age only, the odds of ever attending school for fostered children were found to be 29% of those of non-fostered children (significant at the 1% level). While this is clearly a highly selective sample, the finding

indicates that in households where at least one child was not attending school, fostered children were considerably more likely to be not attending than non-fostered children and that this was not due to factors common to the children at household or community level.

### 8.7 Fosterage in CREATE's Community and Schools Survey (ComSS) Data

For a number of reasons, fosterage is not always straightforward to identify at household level in Dagbon. An important reason is that close kinship bonds are valued highly so that a child may be described as a son or daughter where the relationship is not strictly biological. Oppong explains:

> Children are generally related by ties of kinship or marriage to the head of the household in which they live and should a friend's son come temporarily to live in the house to be trained, his relationship to the head will still be expressed in the kinship idiom (Oppong 1977:11)

Despite this, the observed prevalence of fosterage in the CommSS data is clearly high, even by comparison with the Northern region more generally. Figures are reported in Table 8.10 below. Out of a total of 2872 children in the district aged 6 to 17, 537 or 18.7% were fostered; 15.9% of boys and 22.5% of girls. The figure for girls is not dissimilar to Abukari's (2008) finding of 26% for girls when grandparents were excluded, although neither study used a representative sample. These figures are almost double those found for the Northern region generally in GLSS 5.

**Table 8.10: Prevalence of Fosterage in CommSS Data (2007/8): Children aged 6-17 (N and %)**

| Relationship to Primary Care Giver | Female Child | Male Child | Total |
|---|---|---|---|
| **Biological Child or** | 942 | 1,393 | 2,335 |
| **Grandchild** | 40.3% | 59.7% | 100.0% |
| **Fostered Child** | 273 | 264 | 537 |
| | 50.1% | 49.2% | 100.0% |
| **Total** | 1,215 | 1,657 | 2,872 |
| | 42.3% | 57.7% | 100.0% |

Source: Author's calculations from CommSS

Table 8.11 reports the numbers of fostered children by school in the ComSS data. It shows that at primary level, fostered children (excluding grandchildren) accounted for between around 9 and 33% of all children, with the lowest proportion being in the low-cost private school; the only private school in the sample, followed by the Roman

Catholic schools. The highest proportions were in the English-Arabic primaries followed by the rural DA schools, consistent with Abukari's (2008) findings. At JHS level, fosterage was typically less common, ranging from around 9 to 25%, being highest in the remoter rural DA schools D and F. Since a sizeable portion of pupils in the district do not progress from primary school to JHS, these figures may be considered tentatively to point towards a selection effect in that fostered pupils may be less likely to progress. Clearly the data are cross-sectional and the primary and JHS populations represent different cohorts but other things being equal and based on an expectation of a declining prevalence of fosterage (see Section 8.8), one might expect higher proportions at JHS in the absence of drop-out. However, the number of observations is relatively small. Nonetheless, it is notable that in the English-Arabic schools, the proportion of fostered children at JHS is around half or less of that in the associated primary school. This pattern does not hold in the Roman Catholic or in the rural DA schools except DA School B.

**Table 8.11: Numbers and Percentages of Fostered Children in CommSS (2007/8) by School Attended (N and %)**

| School | Type | Location | Biological Child or Grand-child | | Foster Child | | Total |
|---|---|---|---|---|---|---|---|
| | | | n | % | n | % | N |
| English-Arabic C | Public (Primary) | Peri-Urban | 160 | 75.5 | 52 | 24.5 | 212 |
| English-Arabic D | Public (JHS) | Peri-Urban | 31 | 91.2 | 3 | 8.8 | 34 |
| Roman Catholic A | Public (Primary) | Peri-Urban | 73 | 89.0 | 9 | 11.0 | 82 |
| Roman Catholic B | Public (JHS) | Peri-Urban | 15 | 88.2 | 2 | 11.8 | 17 |
| Low cost private | Private(Primary) | Peri-Urban | 32 | 94.1 | 2 | 5.9 | 34 |
| English-Arabic A | Public (Primary) | Peri-Urban | 58 | 67.4 | 28 | 32.6 | 86 |
| English-Arabic B | Public (JHS) | Peri-Urban | 24 | 82.8 | 5 | 17.2 | 29 |
| District Assembly A | Public (Primary) | Rural | 31 | 77.5 | 9 | 22.5 | 40 |
| District Assembly B | Public (JHS) | Rural | 10 | 90.9 | 1 | 9.09 | 11 |
| District Assembly C | Public (Primary) | Rural | 85 | 79.4 | 22 | 20.6 | 107 |
| District Assembly D | Public (JHS) | Rural | 27 | 81.8 | 6 | 18.2 | 33 |
| District Assembly E | Public (Primary) | Rural | 73 | 84.9 | 13 | 15.1 | 86 |
| District Assembly F | Public (JHS) | Rural | 24 | 75.0 | 8 | 25.0 | 32 |
| Total | | | 643 | | 160 | | 803 |
| % | | | 80.1 | | 19.9 | | 100.0 |

Source: Author's calculations from ComSS

Table 8.12 reports the values of important educational and background indicators for fostered and non-fostered children (columns 1 and 2). Attendance rates are almost identical. Pupils are typically considerably overage for their grades. Fostered boys tended to be more over-age, by an average of 0.82 years when compared to non-fostered boys. However, little difference was found in relation to ages at entry indicating that

over-age enrolment is likely due to age-grade slippage. In terms of household assets and caregiver education and literacy, fostered children's households were found to be slightly more advantaged. At the household level, the mean caregiver literacy score in foster households was 6.34 (maximum 40) compared to 3.68 in non-foster households and the household asset scores[19] were 0.52 and 0.08 respectively. Fostered children, however, had on average attended pre-school for a shorter time. No notable differences were found in relation to health and nutrition indicators, distances travelled to school or hours worked, although fostered children were found on average to live slightly further from a water source, indicating rural habitation. In relation to drop-out, rates were similar for non-fostered boys and girls and for fostered boys, but were notably higher for fostered girls at around 25%. Fostered children scored less in maths and English achievement tests on average, with the difference being marked in English, amounting to a ten percentage point gap. Achievement differences were similar for boys and girls.

Columns 4 and 5 compare non-fostered children living in foster households with those living in non-foster households. It is notable that of the 2872 children, 1484 or 51.7% lived in foster households (in which there was at least one foster child). These households contained an average of 5.0 children (2.5 of whom were fostered) compared to 3.8 children in non-foster households. Although advantaged by living in households with fewer children, those in non-foster households appeared to be more disadvantaged in terms of a number of individual-level factors including drop-out and over-age status, but not in terms of achievement or schooling expenditure. Notably, non-fostered girls in foster households had low drop-out rates (6%) compared to their fostered counterparts (25%). The findings are consistent with those from GLSS data for the Northern region more generally in terms of the indications of higher asset levels, caregiver literacy and household size in foster households.

It is important to note, however, that fosterage is correlated with other important determinants of achievement and drop-out including over-age status and pre-schooling. Further, fostered children are concentrated in particular schools and these were often schools or school-communities with lower average attainment scores and higher drop-out rates. When analysis was conducted at school-level, significant differences between fostered and non-fostered children's drop-out, pre-schooling, overage status and

[19] Calculated using principal components analysis on the portable household assets in Savelugu-Nanton using the ComSS sample (reported in Appendix F Tables A8.21 and A8.22).

achievement were found only in a very small number of schools, although samples were small. However, in a school fixed effects model, significant negative associations were found between fosterage and the duration of pre-schooling and between fosterage and achievement in English. Results are reported in Table A8.13 (Appendix A). Fosterage was found to be associated with a score around 6 percentage points lower than non-fostered children in English and with around a quarter of a year less in terms of pre-school attendance.

**Table 8.12: Children's Education and Background Indicators by Fosterage Status (ComSS Tracked Sample aged 6-18)**

| Indicator | Fostered (1) | Not fostered (2) | t-test significant at 5% (3) | Non-Fostered child in: Foster (4) | Non-Foster HH HH (5) |
|---|---|---|---|---|---|
| Household portable asset score[20] (mean) | 0.70 | 0.24 | Yes | 0.46 | 0.13 |
| Drop-out (boys) (proportion.) | 0.16 | 0.15 | No | 0.11 | 0.17 |
| Drop-out (girls) (proportion.) | 0.25 | 0.15 | Yes | 0.06 | 0.19 |
| Pre-schooling (mean years) | 1.67 | 2.07 | Yes | 2.03 | 2.10 |
| Age at entry (mean) | 7.25 | 7.26 | No | 7.20 | 7.30 |
| Attendance (2007-8)(mean annual %) | 79.39 | 81.16 | No | 82.51 | 80.46 |
| Years overage (mean boys) | 4.98 | 4.16 | Yes | 3.98 | 4.25 |
| Years overage (mean girls) | 3.89 | 3.85 | No | 3.53 | 4.02 |
| Stunting z-score (mean) | -1.48 | -1.33 | No | -1.02 | -1.49 |
| BMI z-score (mean) | 0.05 | 0.03 | No | 0.01 | 0.05 |
| Caregiver literacy score (mean: maximum 40) | 6.48 | 4.58 | No | 6.92 | 3.39 |
| Achievement in English (2007-8) mean girls % | 29.11 | 39.75 | Yes | 41.05 | 39.14 |
| Achievement in English (2007-8) mean boys % | 33.39 | 43.32 | Yes | 39.00 | 45.68 |
| Achievement in Maths (2007-8) mean girls % | 37.96 | 43.19 | No | 44.64 | 42.48 |
| Achievement in Maths (2007-8) mean boys % | 37.37 | 41.19 | No | 40.67 | 41.46 |
| Distance to school (mean km) | 1.72 | 1.72 | No | 1.46 | 1.80 |
| Distance to water source (mean km) | 3.12 | 2.87 | Yes | 2.92 | 2.84 |
| Work (boys) (mean hours/day) | 1.43 | 1.96 | No | 1.75 | 2.09 |
| Household chores (girls) (mean hours/day) | 1.72 | 1.59 | No | 1.63 | 1.57 |
| Schooling Expenditure Boys (mean GhC) | 426690 | 397413 | No | 356979 | 417958 |
| Schooling Expenditure Girls (mean GhC) | 351972 | 388383 | No | 361951 | 402967 |

Source: Author's calculations from CommSS

## 8.8 Analysis of interview data: Interviews with education professionals

The analysis of interview data focuses on the relationships between fosterage and educational access, with particular attention to children's work, Dagbon culture, attitudes to education, reasons for fosterage and migration to *kayaye*. The following discussion draws upon data from interviews with education professionals.

[20] Calculated using principal components analysis on portable household assets in Savelugu-Nanton using the ComSS sample (reported in Appendix F Tables A8.21 and A8.22).

*Prevalence, patterns and trends in fosterage*

In accordance with findings from secondary data, education professionals typically indicated that fostering is common in Savelugu-Nanton. They also indicated a higher prevalence of fosterage among girls. Several respondents indicated that fostering has been declining in the district over time. Reasons cited included perceptions of the disadvantages of fosterage, including in relation to the treatment of fostered children:

> In Savelugu here it is reducing because especially the women, they see how foster children are treated so even if they have to give the child to the sister the woman will resist.

They also emphasised shifting attitudes towards schooling, consistent with the recent dramatic rise in enrolment. An increased appetite for schooling was associated with a shift away from fosterage as was conversion to Chrisitanity owing to its link with monogamous unions. One interviewee explained that perceptions among both men and women are changing and that foster parents may be less inclined to host children who do not attend school:

> if you have a girl in your home and don't send her to school then people will think you are wicked and not treating the child fairly. And they know that if they have a child and want to send it to school they will leave the children with their brothers as it is a big responsibility.

Another referred to 'global awareness' as a reason for the decline, a factor which may be a significant development in the period since the work of Oppong and others in the 1970s. It appears that concern about access to education may be encouraging reconsideration to some extent of the impact of fosterage on children's welfare and prospects. It was noted by two respondents that decline in fosterage is particularly evident where boys are concerned. One explanation appeared to be the decline in the traditional occupations pursued by boys which required training provided through fosterage arrangements.

*Reasons for and functions of fosterage*

Respondents commented extensively on the reasons behind fosterage practices which are considered important determinants of the impact of fosterage on educational access. Their responses are considered using the codification of functions found in Oppong (1973) and in Isiugo-Abanihe (1985).

*Kinship and Solidarity*

All respondents explained that a major role of fostering in Dagbon remains the strengthening of unity within the extended family. Eight considered it to be the primary motivation for fostering. In a specific example, mention was also made, by way of the concept of 'homage' in the comment below, of the custom of betrothal of a man's wife to his sister and the association with fosterage of that woman's daughter:

> Yes it was kind of a homage they give to their sisters (the men) so even sometimes when they give birth to a girl they want their sisters to name the child and take the child and take care of it, it's a sort of prestige that 'oh, my daughter is with her auntie' and the auntie can see that she has got her brother's daughter staying with her.

Another comment emphasised family solidarity but also pointed to the transfer of responsible guardianship, indicating, in line with the literature, that traditionally at least, foster-parents take over responsible decision-making in regard to the foster child:

> If you give your daughter to a brother, you cannot teach the brother, 'I want this', whatever the brother or sister decides to do, you sit down and watch. In those days if a child runs to you, you have to send the child back, to go because you don't want the family to break.

However, the motivations for fostering may be intertwined and evolving. One education professional explained that:

> They say when they do it, it strengthens the unity in their family...That was the original reason but now it's not like that as there are some who uses the fostered child to do domestic work, work on the farm or babysitting.

Another indicated that depending on the balance of family circumstances, while the main reason for fosterage may be family bonding, the direction of fosterage may be determined by economics:

> It is just to create a family bond, so sometimes they will exchange and other times it is one way and it is based on the economic situation.

The literature indicates a simultaneous multiplicity of reasons for fosterage in traditional Dagbon, so that it may be difficult to support the view that domestic labour is a 'new' motivation replacing family solidarity. However, the balance of motivations and reasons for fosterage will clearly depend upon prevailing conditions and context. Where fosterage as described above is "one way and based on the economic situation"

there may be some relief of hardship to the family 'fostering out' and possibly some benefit to the fostered child of moving to a family in a better economic situation, depending on how that child is treated. Indeed, the effect, including in terms of access to education, may depend both on the motivations and circumstances of the donor and recipient family.

*Responsible Parenting and Education*

The role of fostering in ensuring a 'good upbringing' was cited by a number of respondents, who pointed to the potential benefits of fosterage in terms of learning discipline and humility. For example,

> The child is morally trained. You see when a child is living with a different person, the child is sometimes more committed to that person, anything that person says the child will take it more in comparison than with their own father or mother, the biological parents.

They also referred, in the case of girls, of the benefits of fosterage in learning domestic skills and in preparing for marriage:

> So if you foster a girl to your sister, the auntie will teach her how to become a proper woman...if a woman or a girl was brought up by her biological mother most young men would not want to marry her, they'd find she was 'unbred', she was lazy and she would not become a good housewife.

These comments are partly at variance, however, with the views expressed concerning resistance to fostering and 'stubbornness' among fostered children. The conflict was illuminated by one interviewee who opposed the view that fosterage promotes discipline, arguing that the disadvantages fostered children experience may prompt them to leave home for *kayaye* in the South, where it becomes impossible to 'control' them.

> Some people...will not allow them to go to school, they will put them in the house, then when a child will grow up at some stage they start maybe following bad friends or something, then all of a sudden the child will pack and go down South for *kayaye*. So where does the discipline come in here? The child is not with you, how do you control the child?

The education professionals interviewed did not mention as a reason for fosterage the improvement of a child's educational opportunities, except in one case where the interviewee suggested that in the past fosterage had served this purpose, but no longer:

> It used to be advantageous because your parents may not have [the resources] but because of someone fostering would cater for you and you will be educated. But this time no it's not like that.

The views they expressed concerning the relationships between fosterage and education tended to be negative and focused on the impact of foster children's work and status in the family on their education, as considered below.

*Child labour and Indigenous Education*

The role played by fostered children, especially girls, in domestic and care work was discussed by several interviewees. In line with the literature, two referred specifically to the greater ability of a woman to direct the work of foster children from her own side of the family when compared to her own biological children, owing to the foster children's more indirect relationship with her husband. While all Dagomba girls are involved in domestic work, this point suggests a potentially greater burden for fostered girls:

> She sees her as her own child and since she is seeing her as her own child she takes up all her household chores and other things that she the woman would have wanted to do... and so many things that the auntie would have been doing that the auntie's biological children wouldn't even do.

While the foster child's duties are clearly a part of the arrangement of fosterage in many cases, one interviewee appeared to consider them the main reason:

> Mostly if it is the mother's side, they demand to take the girls. Your sister would like to take the girl to take care of them. But we know that it is only to reduce the burden in the house.

Another saw the duties themselves as serving the end of family solidarity, indicative of Goody's 'reciprocities of rearing' (Goody 1973):

> Caring for older relatives as well, the grandmother, you give your daughter to the grandmother to look after. The girl does things for the woman and takes good care of her. So it was family binding.

Interviewees rarely mentioned the indigenous Dagomba system of occupational training in connection with fosterage. In one case, an interviewee explained the evolution of the relationship between education, training and fosterage, emphasising the positive role played in the past, but adding that currently, fosterage is less beneficial educationally:

> It was very good for us because people learnt how to be disciplined, they learnt how to become proper and they learnt how to become good citizens...but it is the secular education that has come and made it a little bit problematic.

In only one case, however, did mention occur in regard to occupational training as a current reason for fostering and in this case the profession was not obviously a traditional Dagomba occupation. Nonetheless, it may be considered a vestige of this historical reason for fosterage:

> I will give my brother my son because he is a white shirt or knows a profession or trade and you want your son to learn it.

*Managing economic shocks and crises*

Economic hardship was cited as a motivation for fosterage by a number of interviewees. For example,

> Some of these parents have children but cannot take care of them themselves and their brother or sister is responsible and have more means to look after the children.

One interviewee linked this to the point that fosterage may favourably redistribute the burden of caring and providing for children, consistent with the fosterage of children by more economically advantaged households. In two cases, 'economic shocks' leading to 'crisis fostering' were mentioned specifically in connection with parental mortality and with the tradition of custody along the paternal line of descent. For example

> After my father's death, the last wife had four children and I had to take all of them away because the woman got married to a new man. She was a young woman and you who is the eldest son of the deceased is seen as foolish and irresponsible if you don't take your half sisters and brothers and if you allow their mother to carry them away.

*Effects of fostering including on education*

Several comments were made in relation to differential treatment of foster children. Interviewees suggested foster parents may care for the children less well than their biological counterparts. This was linked in two cases to the greater work responsibilities of foster children. One attributed this to the expectation of foster parents in respect of receiving children to help in the house, while others attributed it rather to the nature of work commitments more directly, especially domestic and farm

responsibilities. The domestic responsibilities of fostered girls to their aunties were mentioned by several interviewees. For example,

> When a child is been given to their auntie, the auntie says this child is not supposed to be in school because she has been given to me to help with domestic chores not go to school.

Respondents explained that the costs of education also impact on the foster parents' ability and willingness to send foster children to school, depending on the relationship between foster and biological parents, for example:

> They tell the biological parents what the child needs in the school and which they cannot afford and they beg them to come in and give their child assistance to help their child in the school.

In relation to effects on children who had attended school, one interviewee spoke of the effect of fosterage on drop-out:

> Sometimes they drop out at primary level, this is because the auntie will not let them go to school so they don't feel part of the school. They don't participate.

Two others linked the practice directly to poor educational performance, for example

> Sometimes a child comes to school but they are slipping and the school asks why are you coming in late and the child says 'oh I am not staying with my parents I am staying with my auntie or this and that and early in the morning before I come to school I have to do this, do this, do this or have to work late at night that's why I am always sleeping in school.

*Kayaye*

Education professionals made a number of references to *kayaye*, especially in connection with fostered girls. One interviewee explained that children migrate to *kayaye* from as young as 9 years old. A head teacher from another ethnic group associated the practice with historically low levels of education among the Dagomba, while several suggested the phenomenon may be increasing. Concerning the 'push' factors which lie behind the decision by a child and/or its carers to leave the district to migrate south for *kayaye*, interviewees mentioned hardship at home, particularly for fostered children, the need to raise capital required to buy items needed for marriage and poor educational performance. They suggested that economic necessity was a key reason for *kayaye*, for example

> They are forced to do it so sometimes you see them running to Accra because they don't like the status and hardship they face.

One respondent suggested that poor school performance in combination with poverty may also motivate *kayaye*, while four commented on 'push' factors specifically in relation to foster children. One cited general unhappiness in the foster home, while the others pointed towards onerous work commitments at home or on the farm. For example,

> When the girl becomes fed up with the job and sees the auntie's children who are in formal education and she is not, she finds others who are also in the same position and they flee to the South.

Another interviewee indicated that parents, especially but not exclusively, foster parents may push children in the direction of *kayaye*:

> The foster parents, but some biological parents also encourage their children to do that, especially the women.

In relation to the relationship between fosterage and *kayaye*, another interviewee also indicated that children raised by biological parents, may go into *kayaye*, especially following a family crisis, or in cases of extreme poverty. Others emphasised the role of fosterage in particular:

> *Kayaye* is more of a recent development. But it contributes a lot to... I mean fostering contributes a lot to the *kayaye*.

With regard to the 'pull factors' motivating *kayaye*, interviewees spoke of the economic opportunity it offers by comparison with work in the North. For example, referring to boys one respondent commented:

> They go there to buy scraps, the metal and go there for self-sufficiency. It is mainly because their families are poorer. There are fewer job opportunities here so that is why more people do it.

The opportunity to raise money to acquire items needed for marriage as a motivator for going to *kayaye*, particularly among fostered girls, arose in several of the interviews with education professionals. The interviewees explained that the girls' guardians, especially foster parents may encourage them to migrate to earn money to acquire the items:

> They want to say that there's a law to marry children out properly, the number of things that a girl will need, the number of dishes, bowls, whatever and all these need money, so sometimes the aunties will even cross the girl to go and look for money to come so they can prepare her...for marriage.

In other cases, it was explained that the girl may make the decision herself, in part to escape conditions in the foster home and in part to raise money for marriage items

> Some of them do run away to stop their aunties' treatment and some of them do go there to bring the money to support themselves...during their married time.

A private school head teacher presented a slightly different view on the *kayaye* phenomenon, indicating that pupils in his school sometimes did such work in the school holidays, though without interrupting their schooling. This mode of *kayaye* may be considered related to the fact that carers of these children are affluent enough to afford (relatively low) school fees and have clear preferences for (at least perceived) educational quality, while typically still being relatively poor.

### 8.9 Household Interviews

10 of the eighteen caregivers interviewed in the household foster-carer interviews were male and 8 female. Results of the background questionnaire showed that their ages ranged from 30 to 75 with a mean of 56. 93 children under eighteen were identified as living in the sampled households – 42 females and 51 males. Of 91 children for whom all responses were collected, 32 were biological children of the caregiver 41 were grandchildren and 18 (10 boys, 8 girls) or 20% fostered, a figure similar to the overall proportion in the ComSS data. Among the fostered children, 17 were nieces or nephews of the caregiver and one was a child of the household caregiver's co-wife. 17 out of 18 caregivers were illiterate or had never attended school, while one had attended night school; indicating a very high prevalence of illiteracy in this rural sample. Households contained between 1 and 10 children with a mean of 4.9. 73 children were in the school-age (6-17) group. Caregivers reported that 10 children in this group were not attending school – 5 biological children, one grandchild and four fostered girls. Overall, the characteristics of the rural sample of foster families interviewed were consistent with traditional Dagbon social organisation indicated in the literature; with large household size and polygamous and extended family living arrangements reliant on subsistence agriculture.

*Family livelihoods and children's work*

When asked about their main source of livelihood, almost all caregivers replied that they were farmers. In addition, a number engaged in agricultural labouring for others, petty trading and shea nut gathering and processing. One household was the dwelling of a wanzam family of traditional barbers and circumcisers. In response to a question about whether they sometimes had difficulty meeting the family's basic needs, all caregivers said that they did; with some experiencing problems as serious as starvation. They mentioned poor farm yields, the seasonality of farming, crises (especially mortality and illness) and a low level of demand for their products. They referred to additional difficulties experienced during the rainy season; during which time families are unable to farm and rely on alternative sources of livelihood. For example,

> Yes sometimes it is a problem meeting my basic family needs in the sense that there are certain times that there is no food, like in the rainy season, then what we depend on is the shea butter that I am doing, where we get a little money to take care of the family's needs.

Several commented specifically on the consequences of economic hardship for children's education, in particular the difficulty experienced in meeting costs. One made clear the severity of the problem and of the trade-offs sometimes faced in raising money for schooling. Poverty may even require a choice between adequate nutrition and meeting school costs; a serious issue in a district where under-nutrition is very common.

> We face a lot of problems. Sometimes we sell the little food we have to buy the children's school needs and when we are faced with starvation we sell the few sheep and goats that we rear and that's how we continue to exist.

When asked about their children's work, 11 out of 14 caregivers who commented explained that boys and girls typically do different kinds of work; while all those who answered said that the kinds of work done by fostered and biological children are the same. Boys' work was mostly described in terms of farming and occasionally petty trading, while girls' work was explained to be primarily domestic including fetching water, but also included trading and shea butter extraction as well as some aspects of farming such as sowing and harvesting, largely in accordance with the literature on traditional children's work roles in Dagbon.

*Education*

In relation to educational access in terms of school availability and quality, the vast majority of caregivers gave positive responses, indicating that basic education is within reach in distance terms and that it is of adequate or good quality. Only one mentioned poor teaching, citing poor teacher motivation as the problem. These responses were quite different from those of the education professionals. One foster carer said that for rural children the provision of bicycles is needed. Others did explain, however, that post-JHS provision is difficult to access. The overwhelming difficulty expressed by caregivers, concerned meeting the costs of schooling; most often indirect costs. All caregivers replied that they experienced difficulties supporting their children's education. Eight commented on the difficulties in meeting the cost of uniforms, five the cost of books and materials, four school fees and levies, two the cost of food and three explained the problem in relation to poverty more generally, for example:

> We experience a lot of difficulties in terms of financing, especially school uniform etc. As for the distance to school there is no problem because the school is not far from the house at all but we experience a lot of financial difficulties.

Concerning the relative importance of girls' and boys' schooling, eleven caregivers said that both should be prioritised equally, while one favoured boys' education and two favoured that of girls. In the case of the preference for boys, this was expressed in terms of the lower probability of girls' completion and the possibility of migration to *kayaye*. However, another caregiver interpreted what may be the same the difficulty somewhat differently, indicating that because of the expectation of marriage, which may shorten girls' time in school, their education should be emphasised:

> It is important to educate girls more than boys – for in a very short time they will be at their marital homes. With some education it will help them fend for the family and that is why girls should be given more importance than boys.

*Family structure and fostering*

Caregivers were asked about their family and household structure. 14 were found to be in polygamous unions and 4 in monogamous unions. Where the number of wives was mentioned it ranged from 2 to 5. They were asked if any of their own biological children were fostered to other relatives; 13 replied that they were while 5 had no children fostered by others. This suggests fosterage was a reciprocal arrangement in the

majority of cases in this sample. The high prevalence of polygamy may be attributed to the fact that the sample is of households in rural Dagbon where traditional livelihoods dominate and where traditional culture may be subject to weaker external influence than in urban areas. Caregivers were asked about how they came to be foster parents and about the reasons for fosterage relationships. Comments are considered below.

*Kinship, Solidarity and Responsible Parenting*

Kinship and solidarity reasons for fosterage were cited most frequently by far and this accords with the comments made by education professionals who cited these as primary. Several dimensions or interpretations of family bonding were explained to be enhanced through fosterage. Fosterage was often said to promote 'getting to know' members of the extended family. Where evaluative remarks were expressed in relation to fosterage (four cases), caregivers were positive about the tradition, considering it to be 'good' or 'important'. For example:

> In our Dagbon custom, fostering is very good and important because it promotes family relationships between the biological parents and you - the person who has taken the child and also it is good for the whole family.

Also, on a related reason, the suggestion that fosterage would promote visiting parts of the family who might otherwise be 'forgotten' was made four times. Further, the Dagomba conception of children's belonging was expressed in relation to a wider kinship network, beyond that of their biological parents. This point may be considered an expression of the 'claim' to foster children which may be exercised by relatives in the extended family.

> Yes I can explain, the children are my brother's children and according to tradition my children belong to my brothers and my brothers children belong to me.

The traditions of fosterage were also explained in terms of betrothal customs associated with pregnancy rites in four cases. In the cases where such accounts were given, the fostered children were girls. The tradition of fostering girls in this way was expressed more generally by one female caregiver and may in part behind the higher prevalence of fostered girls when compared to boys.

> The reasons for fostering are about family bonding and we have the tradition that the child is for the man so if you give birth to a girl, the man will always want to give the child to his sisters to look after.

The notion of 'responsible parenting' as a reason for fosterage appeared implicitly many times through foster parents comments about education and so on but appeared three times more explicitly. Foster parents explained that a 'proper upbringing' could be better provided through fosterage, firstly because of a lack of capacity on the part of biological parents, secondly because the biological parents lived in Kumasi where the respondent believed it may be more difficult to provide a 'proper upbringing' and thirdly where upbringing by foster parents may encourage a child to be 'more sensible'.

*Schooling*

Four foster parents commented directly that providing education was a part of the reasoning for the relationship of fostering. These comments illustrate the complexity and contingency of the implications of fosterage for educational access. Extended family networks may be engaged to support parents who may be unable to send children to school, for example:

> The children's father who is my son lives in Kumasi and when the child is delivered she sends them to me and I send them to school.

> and

> The father came over here to do farming and when he came he saw the schooling here was very good so he decided to bring the girl to me to take care of.

While in other cases, fosterage appeared to inhibit access. Providing for a foster child's education presented difficulties for some caregivers. Several comments were made about the bearing of the cost-burden. Among caregivers who commented on whether they received help from the biological parents of their foster children, four said they received some help, for example:

> When the girl needs something and I have money I will buy and when I don't have, I ask my brother her biological father to assist me, sometimes he does but sometimes he will say he has no money, in fact that is the only problem that we face.

Seven interviewees, however, explained that they received no help. These findings are not dissimilar to Abukari's (2008) findings in relation to fostered girls. For example

> In my case, the father doesn't care about the girl again. He's even telling me that if I would like to take the girl out of education I can; that a girl's education is not very important.

In these cases the burden appeared to lie with the foster parents. It is also clear that these foster parents felt unsupported by the biological parents in relation to the fostered children's schooling. In one case it was implied that the foster parent would benefit by taking care of the foster child, indicating a reciprocal arrangement, perhaps by receiving domestic help. In another a more equivocal point was expressed, indicating that a biological parent's help may depend upon the perception of need:

> Yes I am responsible for the education of the foster child but sometimes when the biological parents see you are not capable or there are poverty issues around they will help you but if they can see you are capable they will not.

Further, it is particularly notable that two foster parents stated that while they send their foster children to school, their own biological children, fostered to other relatives, are not attending. At least one of the parents appeared to lament this state of affairs, but was apparently not able to prevail upon the foster parent to send the children to school:

> It is very unfortunate that all my children who are boys are not going to school. Only the girls attend school. The girls that are with me, the parents are not bothered. The parents do not even come to see how they are faring.

These comments indicate that foster parents are in these cases the main decision making agent with regard to children's schooling and that schooling was not a motivation for the fostering arrangement. It might also be suggested, given the apparent discontent among these parents about their biological children's schooling, that they are unable to influence the foster parent and that the fostering arrangement may be more a matter of obligation than choice.

When asked about progress in school directly, all foster carers said they expected their fostered and biological children to reach the same level of education ultimately. When asked if they thought fosterage impacted on children's school work only one answered that it does. On the question of whether fosterage impacts on a child's progress in

school, again only one answered that it does, suggesting that greater work commitments may reduce the ability to concentrate.

*Children's Work, Indigenous Education/Training*

It was only in one case that a foster parent explained explicitly that a main reason for fosterage was the provision of domestic labour for the household. In six cases, however, it was explained that a benefit or an advantage of the foster relationship was the additional labour in farm or domestic work provided by the foster child. For example

> There are a lot of advantages. When they come back from school they help me on the farm. Sometimes I don't even need to tell them what I want them to do. They quickly get to know what I want them to do and they do it for me.

In only one case was a reason for fosterage given in terms of indigenous education or training. This caregiver was a wanzam who explained that a child had been fostered out by his biological father to learn the traditional skills of the wanzam. Notably, however, the foster parents had also enrolled the child in school, indicating an apparent accommodation between indigenous and formal forms of education:

> We are traditionalists who barber and circumcise people...The child is now able to barber people but is yet to learn how to circumcise people – we are teaching the child how to do this plus at the same time he is schooling at the community school.

*Crisis and Redistribution of Children*

In three cases crisis in the form of mortality played a part in fosterage arrangements. In one, a grandmother was caring for her late daughter's children. In another a child who had been fostered to his grandfather was subsequently fostered by an uncle upon his grandfather's death. In a third case, fosterage followed the death of the caregiver's sister-in-law. In this case, schooling of the child appears to have been a benefit of fosterage. In two more cases the arrangement was not a result of crisis but 'redistribution' so that childless women were given a child to take care of through fosterage. For example

> That is my uncle's daughter, she was given to my own mother and my mother realized that I didn't have a child with me so she gave her to me to help me when my own children are delivered.

*Foster Relationships*

In the comments considered already, caregivers emphasised the need to take proper care of foster children. When asked if there were any differences between their relationships with foster and biological children, all caregivers said that there were not. Equally, when asked directly about the effects of being fostered on a child, almost all said there were no adverse effects. For example

> There is no difference between them. Indeed a foster child we regard more. If there is a quarrel between the biological and fostered child we tend to support the foster child more because we don't want a situation where the child will feel that because their mother or father is not in the house they will be mistreated.

However, in response to a question about any difficulties experienced in fostering children, a number of caregivers explained they had difficulty in meeting the basic needs of foster children. This view had already been expressed in relation to meeting children's needs more generally, but may be more acute in relation to foster children. For example,

> Sometimes when you have a child with you sometimes you are not able to provide. You see them being lonely and pondering issues and if their father sees then it becomes a problem.

Two caregivers explained that sometimes a foster child may be affected by not living with his or her biological parents, in terms for example of behaviour and self-esteem. None explained these problems in terms of their own foster children explicitly. Respondents often discussed the issues around the fostering relationship in terms of contingencies. In the case of the child's behaviour in response to fostering this was indicated to depend upon the child in three cases. For example,

> It depends on the child. Sometimes due to a childish mind the fostered child may think that because they are not your biological child that you are disturbing her but that is not the case.

In three other cases, the care given to the child was emphasised as an important driver of the effects of fosterage:

> Fostering will have effects on the child – dependent on how much care is given to the foster child. If given proper care, the effects will be positive – no problem. If not given good care the affects will be negative.

More specifically, four respondents explained that some foster parents treat foster children less well than their biological children, while none expressed this in terms of their own case:

> Some foster children suffer in many respects – some people do not treat them well – they beat them and say they are not their true children. I am not such a one, I don't agree with such treatment.

Three caregivers perceived a decline in the prevalence of fosterage in Dagbon. Perceptions of unequal or poor treatment were cited as possible reasons for the trend. However, respondents themselves typically remained positive about the fosterage tradition, emphasising the benefits in terms of family bonding but also the need to treat foster children well. For example

> I want to stress on the need to take proper care of them and I have heard some people comment that fostering will stop in the future. I think that it is a good thing [fosterage] because of the family bonding. Some take children as foster children and will not take proper care of them – which I think is not right.

*Kayaye*

When asked if they were aware of children migrating from the district to work in *kayaye*, several caregivers explained that they were, including two whose own children had migrated. All the specific cases mentioned were of girls and all cited poverty as the main reason for leaving home. For example

> Yes I have some children who have gone away to Kumasi to work, even though it's a city, they are farming. It's because of poverty. We don't have money here and can't find enough to eat so while she is away at *kayaye* she gets a few Cedis and send them to us occasionally.

In addition to the 'push' factor of poverty the issue of raising money for marriage items was raised. At the household level, two comments referred or alluded to this reasoning for *kayaye* among girls. In the case of one caregiver whose own children had gone to *kayaye*, she explained,

> Even my own biological children who live with their aunties have gone away to *kayaye*. They go there because back home there is nothing to do and there is no standard income for them. These are mostly girls and at a certain age they will have to marry, so they always want to go to the South to make money and help their aunties so they can marry them well and eventually get the items they need to marry for them.

### 8.10 Interviews with *kayaye* workers

Tables A8.14-A8.20 are included in Appendix C. Table A8.14 provides details of the background and educational characteristics of the *kayaye* workers interviewed at their place of work. Ten of the twelve interviewed were female and two were male. Ages ranged from sixteen to twenty-one. Seven hailed from Savelugu-Nanton district and five from neighbouring Tolon-Kumbungu. All interviewees from Tolon-Kumbungu came from rural areas while three from Savelugu-Nanton came from urban areas, namely Savelugu or Nanton townships. Two female respondents reported that they had children of their own – one aged one and a half and one aged three. Six had been living in Accra for a year or less, three for three years or less and three for more than three years. Three had never been to school, three had dropped out after one year of primary school and one after kindergarten. Another two dropped out in the later grades of primary school while three had completed primary education and dropped out in the first year of JHS. One interviewee was attending night-school, while the others were receiving no education at the time of the interviews. Although they had dropped out of school in different grades, most were 14 to 16 years old at the time of dropping out. It is notable that many were considerably 'over-age' for their grade at the times of drop-out. In particular, the three girls whose highest completed grade was primary 1 had dropped out at age 14 or 15 while primary 1 would ideally be completed by age 7.

Table A8.15 presents data on the interviewees' family and work situations. Three of the twelve indicated that they had lived with their biological parents before migrating to Accra. Two had been fostered by grandparents, one by a sister and four by aunts (one more had been fostered by an aunt but returned to her mother on the aunt's death). The number of siblings reported by interviewees was between two and twelve. These results indicate that a majority of the sample had previously been fostered (9 out of 12). While the sample is clearly not representative, this finding is consistent with the indications of the literature and earlier interviews that *kayaye* is often undertaken by foster-children and especially foster-girls.

Both of the male interviewees were working as scrap dealers. Previously, in the North, one had helped on the farm and the other had been involved in trading and domestic chores. Two females were trading in Accra while eight were working in *kayaye* literally speaking (head-porterage). Previously they had been involved in farming, domestic

chores and petty trading. On the question of current earnings, the interviewees responded that on days when they earned money, they typically made between three and six Ghana Cedis per day (approximately 2 to 4 US Dollars).

In order to examine the relationships between educational access, *kayaye* and fosterage, as discussed below, interviewees were asked about their reasons for leaving school, reasons for migration to Accra, their experiences of school, work and of *kayaye* and their family situations and aspirations. The results of the interviews are summarised in Tables A8.16-A8.20.

*Schooling*

As summarised in Table A8.16, all the interviewees said that they had enjoyed school and most reported that they had attended well while enrolled, except in three cases where work intervened; and one where costs affected attendance. All also reported that they thought their school work was satisfactory, except in one case where costs at JSS level had hindered progress. When asked about any problems they experienced in relation to schooling, 10 cited issues of schooling costs, indicating that a lack of money for fees, uniform and equipment was a problem. Regarding the question of who had helped with schooling costs, a mixed pattern emerged. Most said they had received some help from the guardian they lived with, when those guardians were able. Two foster children also said they received some help from their biological parents while fostered. In several cases, economic shocks and the effects of fosterage appear to have been important in affecting meeting school costs. All the youths said they wished to have received more schooling than they did.

When asked directly about the main reason why they had stopped attending school, of the nine youths who had ever attended, money and costs were cited in eight cases (see Table A8.17). Among the reasons behind the lack of funds, poverty and guardian mortality, bankruptcy and old age were cited. In one case, a girl had been taken to live with a foster aunt who compelled her to drop-out. She explained:

> Schooling was good for me and I didn't like to drop out at that early age but certain things were out of my control and that was why. It was due to being fostered by my auntie and I was not happy when it happened and I was compelled and had no other way of refusing and that made me drop at an early age. I would still like to return to education.

Another explained that conflict between her foster-aunt and grandmother had been a cause of dropping-out. A further interviewee explained that her father's old-age meant he could not continue to support her schooling, resulting in drop-out:

> My father was helping me but due to old age he couldn't help me to my satisfaction and there was nobody else. That was why I stopped my schooling.

*Migration to Kayaye*

When asked about the reasons why they had gone into *kayaye*, in terms of 'push' factors the interviewees' reasons were often closely linked with those given for dropping out of school, in the cases of those who had ever-attended. They explained that they had gone to *kayaye* because of lack of money, support or work; linked to mortality and poverty at home. In terms of 'pull' factors, the interviewees' comments centred on the economic opportunity available in Accra, often linked to a wish to acquire either capital for self-employment or items for marriage. Five respondents said they had not been encouraged to go to *kayaye* and had made the decision themselves, while the remaining seven had been encouraged by their friends and foster or biological parents. Results are summarised in Table A8.18.

In response to a question on their experiences of *kayaye*, replies (see Table A8.19) showed mixed picture. Two said that living conditions were better than at home in the North while three reported that their conditions were difficult. Several appeared to have been disappointed owing to the irregular and precarious nature of the income from *kayaye* and by the costs of living in Accra, while others reported that the money they received was adequate. Commenting on the positive aspects of *kayaye*, the benefit of self-sufficiency was mentioned explicitly three times. For example:

> In the house my guardian will have to take the proceeds of my labour but in Accra all the proceeds are going to be used for what I specifically want to acquire.

Clearly, comparisons made between life and work in Accra and in the North depend on the individual balance between experiences. However, it may be expected that the lives of *kayaye* prior to migration had been somewhat difficult. Responses ranged from a strong position favouring work life in *kayaye*, for example,

> Work life in Accra is better than at home. They can never be compared. At home with the farm work you do all these things and you get something very small and meagre

to a strong view to the contrary:

> I feel that at home it is far better. Over here you come and you suffer a lot and sometimes you don't even get the money.

*Intentions and Aspirations*

When asked if they intended to return home to the North, all interviewees said that they did. Regarding what they intended to do or to achieve before returning, respondents referred to the need to save money to return, to items they wished to acquire, either for marriage or self-employment, and to an intention to return around harvest-time when their labour would be required. Four girls specifically commented that they intended to gather the necessary items for marriage. One commented that raising the money for more education was the main reason for migration to Accra, while three others also wished to raise money for further schooling. A number of respondents commented on the education they would ideally like to receive and on this issue five made specific reference to learning vocational skills, including learning to be a seamstress. Results are summarised in Table A8.20.

The interviewees who had been fostered were asked if they thought fosterage had affected their schooling or their decision to migrate. Two explained that fosterage was not a major factor. While three others commented explicitly that fosterage had been an issue. For example,

> Being fostered had a tremendous effect on my schooling and work at home - sometimes I would leave the foster home to go to the biological parents to demand of certain things and they would say he had better go back to the grandfather and will not want to even help. I think that has contributed a lot to affect my schooling at home.

**Photograph 4: *Kayaye* Workers at Agbogbloshie Market, Accra**

Source: Field visit July 2010

**Photograph 5: Scrap Dealers at Agbogbloshie Market, Accra**

Source: Field visit July 2010

## 8.11 Discussion

While most adults in the Savelugu-Nanton district remain illiterate, access to education for children, including foster children, has expanded considerably in recent years; and caregivers were typically found to value educational opportunities for their children. There is some suggestion in the data of 'culture shift' in favour of support for public schooling and away from traditional forms of education and training and perhaps also away from practicing fosterage. But the prevalence of fosterage remains high. Around one in ten children in the Northern region of Ghana are fostered, while data for Savelugu-Nanton suggest a figure closer to one in five. Both boys and girls are regularly fostered, but rates are higher for girls. An important part of the explanation for high rates of fosterage in Savelugu-Nanton consists in the traditions and culture of the Dagomba. This also applies to the higher rate for girls, since custom emphasises the fosterage of girls, particularly to their fathers' sisters. The main difficulty caregivers expressed in relation to educating their children, both fostered and biological, concerned the affordability of indirect costs of schooling, despite recent cost reduction initiatives. Nonetheless, educational disadvantage for fostered children in particular was apparent in all sources of data.

*Fosterage and the CREATE 'zones of exclusion'*

Returning to the CREATE conceptual model of 'zones of exclusion' outlined in Chapter 1, data analysis has provided some specific evidence in relation to fostered children in the context of northern Ghana and Savelugu-Nanton. Concerning 'zone 0' – exclusion from access to pre-schooling; analysis showed that in the Savelugu-Nanton sample, fostered children received on average one third of a year less pre-schooling, which remained when taking account of their backgrounds. While the reasons for this and its effects were not addressed specifically, well established relationships between early childhood education and later educational progress provide reason to expect that this early disadvantage may contribute to later inequities between fostered and non-fostered children, including in terms of their exclusion outcomes. Fostered children in the Northern Region generally were also found to be excluded in 'zone 1' (never enrolling in primary school) more often, being nineteen percent less likely to ever enrol and even less likely to enrol when compared to biological children living in the same household. Fostered children were also found to have drop-out rates at basic school level twice as

high as the non-fostered in the 6-18 age-group (exclusion zones 2, 4 and 5) and indications from national-level analysis are that fostered children typically progress considerably less often to primary and junior high school completion. In the Savelugu-Nanton district, CommSS data indicate that drop-out among fostered girls is particularly high and that fostered children appear to make the transition to junior high school less frequently. With regard to 'silent exclusion' (zones 3 and 6) in the forms of poor attendance and achievement which reduce 'meaningful access' to education, analysis of CommSS data did not find a difference between fostered and non-fostered children's attendance, but did find that fostered children attained less, particularly in English, including when taking account of their backgrounds and the schools they attended.

*Reasons for fosterage and their impact on educational access*

Many of the reasons given for fosterage in interviews were very similar to those cited by scholars in the 1970s. The high cultural value placed on the role of fosterage in promoting kinship solidarity was emphasised both by education professionals and caregivers and is considered the dominant explanation for fosterage practices. Other cultural beliefs were also considered important by both sets of interviewees in motivating the fostering of children, including the benefits of fosterage in terms of 'responsible parenting', while reasons associated with indigenous education traditions were rarely mentioned. 'Crisis fostering' was found to be practiced as well as fostering specifically to improve education opportunities, for the purposes of providing domestic help and for economic reasons. It is clear that in some circumstances fosterage enhanced children's educational opportunities. Although not a dominant reason for fostering, in a number of cases which emerged in household interviews, children were fostered either with the explicit intention of facilitating schooling or with the added benefit of better schooling; including where the reason for fosterage was crisis or mortality in the natal home.

'Perception gaps' were discernible between the responses of education professionals and caregivers in relation to both the reasons for fosterage and to their effects. Education professionals drew attention to the benefits to foster carers in terms of foster girls' work and to the consequent disadvantages regarding schooling, while caregivers emphasised the positive aspects of fostering, including the educational opportunities afforded to some foster children. Education professionals occasionally appeared to see

kinship reasons for fosterage as a pretext for fostering for reasons of child labour. Both, however, agreed that in some households, foster children are sometimes treated less well than their biological counterparts, including being expected to work more, although the working hours reported for foster children in school were apparently not prohibitive with regard to schooling; and indeed the attendance of foster children in school did not differ from the non-fostered. In the cases of fostered children who are out of school, however, work responsibilities may be greater and interviewees suggested this is the case, particularly for some girls, whose duties were mainly domestic or in petty-trading. The work of foster boys may be less in demand owing to a decline in traditional occupations. Nonetheless, work and periods away from school associated with seasonal agriculture may be part of the explanation for the higher levels of age-grade slippage among fostered boys.

Part of the reason for greater work commitments is found to consist in the 'reciprocity' aspect of the fostering relationship, which means that foster children may be under greater pressure to 'earn their keep'(see Goody 1973), consistent with the expectation of foster parents that the fostering relationship would be of benefit to their households. Since the benefits of child work did not emerge, however, as a primary reason for entering into foster arrangements, it is argued that children's work is better understood as a consequence than as a cause fostering in the context of Savelugu-Nanton.

The requirements of 'preparation for marriage' are found indirectly to impose potentially greater work requirements on fostered girls. Raising the necessary funds for marriage is typically a requirement of the foster home, consistent with the custom that foster families assume the responsibilities of guardianship of foster children. But where resources are lacking or where foster parents may be unwilling to offer support, girls are sometimes found to avail themselves of the opportunities of *kayaye*. In addition to the potential to earn money for marriage items; financial and other forms of independence were suggested to be particularly attractive where girls experienced hard working lives, lack of access to schooling and/or mistreatment in the foster home. Evidence of high levels of early drop-out among fostered girls in the data, but also smaller numbers of girls in the household sample, are consistent with and may be consequences of girls being drawn into *kayaye*.

Differences in educational access between fostered and non-fostered children are partly attributable to the characteristics of sending and receiving household and to decisions made by and between these households. In addition, differences in the purely descriptive statistics, for example on attainment in English, are partly accounted for by differences in foster and non-foster children's contextual characteristics, at the school and community levels. Because fosterage is a part of traditional Dagbon culture and is associated therefore with adherence to other aspects of that culture, there is significant overlapping of cultural, locational, educational and other factors which calls for caution in the interpretation of associations between fosterage and educational disadvantage and particularly of causal relationships. Fosterage is more common in rural areas, where Dagomba traditional culture may be stronger, affecting gender roles and the importance of traditional marriage preparations, for example. The rural areas were not, however, prohibitively far from basic schools in the ComSS sample.

Fosterage is especially common among primary when compared to secondary school pupils in Savelugu-Nanton, partly because of higher drop-out and lower transition among fostered children (especially girls) subsequently, but also because recent policies (especially cost-reduction through FCUBE and the Capitation Grant) have increased the supply of and the demand for basic education in rural areas where fosterage is more common; and also perhaps among groups where demand for education was historically low. The literature from the 1970s and previously describes low participation in and enthusiasm for public education in Dagbon; a picture which, however, appears to be changing. Some public English-Arabic schools and rural DA schools in Savelugu-Nanton have seen large growth in enrolments and some of these schools are found currently to have very large class sizes. The literature emphasises the traditional value placed on indigenous and Koranic education among the Dagomba, among whom fosterage is also valued; which may partly explain the high prevalence of fostered children in English-Arabic schools (consistent with Abukari's findings) which provide both secular and Koranic learning, some of which were formed from former private Koranic schools as part of the district's drive to increase enrolment. Moreover, some of these schools are relatively poor performing schools, accounting in part for the lower performance of foster children, while not being directly due to fosterage. By contrast, in the relatively new low-cost secular private school in Savelugu for example, fostered

children are very few, indicating differences in the cultural backgrounds of pupils between schools.

In Savelugu township, the availability of a number of types of schools relatively close together, including English-Arabic, Roman Catholic and private suggests selection effects as a result of school-preference; in a context where parents are relatively free to choose between schools, particularly following recent policies to improve access. The numbers of fostered children in the schools which do not provide Koranic instruction were small, where choice was available. In the rural parts of the district surveyed, only DA schools are available and these were found to have high proportions of fostered children. While the viability of Dagomba indigenous education practices are considered to be part of the reason for historically low enrolment in public schools, these were rarely mentioned in interviews, suggesting a decline in their importance which is also consistent with an increased appetite for public schooling; which was expressed in the generally positive attitudes of household caregivers, including towards the education of girls.

The data for both the Northern region and for Savelugu-Nanton indicate that typically foster households are more economically advantaged than non-foster households, with the caveat that they contain larger numbers of children. However in the GLSS data, per capita welfare, taking account of household size was still higher on average in foster households. Thus, the data rather supports the suggestion that foster children are more often sent from less to more advantaged households, perhaps in part to alleviate poverty in their natal homes; consistent with Akresh's (2007) findings for Burkina Faso. Some support is also given to this finding in the interview data where it was suggested that the economic situation, while not the primary reason for fosterage, could determine the direction of inter-household fosterage relationships. Neither was there evidence of disadvantage in the form of caregiver literacy levels in foster homes, since in fact foster households had higher literacy or household head education levels. Inter-household fostering decisions may, then have the net effect of redistributing children to slightly better-off homes both economically and in terms of education indicators. Hence it does not seem generally plausible to suggest that the prevailing economic situation in foster homes per se lies behind the educational disadvantage of foster children. Nonetheless, foster homes, especially in rural Savelugu-Nanton, do experience considerable poverty and consequent difficulties in affording schooling costs for all children. This was

emphasised at interview by almost every respondent in the sample of rural foster carers. For children in school, however, per-child spending on education did not vary notably by child fosterage or foster-household status in the ComSS data, although non-fostered children in foster households were found to receive the highest average levels of spending in the GLSS data.

What appears to be key to the determination of foster children's educational outcomes within households is intra-household decision making and resource allocation in the context of very tight budgetary constraints. It may be argued that in these circumstances even small differences in preferences for education among carers for biological and fostered children and between the statuses of these types of children within the family and household may therefore be expected to have important effects. Foster children were not found in general to benefit in educational terms from the relative economic advantages associated with foster homes. Non-fostered children in these homes, however, typically did benefit. Indeed, these children were found to be advantaged in terms of school enrolment in the region and in terms of drop-out in Savelugu-Nanton, where they also attained achievement scores more similar to those in non-foster households than to fostered children. These findings contrast with the negative effects of living in foster-homes on non-fostered children found in Cameroon by Marazyan (2009). Intra-household decision-making appears then to offset the economic advantage of living in a foster home where foster children are concerned. This household 'Cinderella effect' is an important reason for poorer educational access for fostered children which may be exacerbated by larger household size; but is arguably a predominantly cultural phenomenon.

Responsibility for foster children's education typically falls primarily to the foster-parent, as argued in the literature and indicated in interviewees' responses. Several reasons have been considered why foster parents may attach a relatively lower priority to foster children's education, including expectations of work; with apparent effects on their pre-schooling, age-grade slippage for boys, drop-out for girls and attainment in English. Becker's (1991) argument that a weaker biological connection may also motivate lower prioritisation may also be part of the explanation, and this is consistent with the finding that some foster children experience inferior treatment in the foster home. It may also be exacerbated by the apparent obligatory nature of the foster relationship, in accordance with kinship rites. This was illustrated by the reports of

some biological parents that they wished for their children to be enrolled although they were not owing to the foster parent's inability or unwillingness or unable to enrol them; supporting the suggestion that kinship obligations towards fostering were primary, despite the effects on schooling. Further, it is customary that girls are fostered by women, with possible negative consequences for their schooling, since male household heads may not consider it a priority to bear the costs of educating girls for whom they do not consider themselves directly responsible, especially in circumstances of relative poverty.

The decision to send a child to school was found to be influenced significantly by cost and affordability concerns in both survey and interview data. Despite the apparently lower priority accorded to foster children's education, the effects on educational outcomes may in some case be alleviated through the receipt of assistance, be it financial or otherwise from biological parents, depending on their relationships with foster parents, their willingness and their means. Some interviewees stated that they received such help but many did not, consistent with Abukari's (2008) findings. The prevalence of low incomes in is clearly a major reason why some biological parents feel unable to assist. A further potential reason for poorer school performance by fostered children who are in-school, and whose attendance does not differ notably from non-fostered children, may be found in the possible effects on their self-esteem resulting from the foster relationship in cases where fostered children are accorded inferior status or treatment, as indicated in care-giver interviews. Both education professionals and caregivers suggested that issues in the foster relationship may impact negatively on the child in terms of self-perception; and while this was not investigated directly, it is plausible that such impact might reduce performance and consequently 'meaningful access' to basic education.

From the limited evidence available, migration to *kayaye* is found to result from particular disadvantage within the home, as well as perhaps from a more proactive orientation towards self-sufficiency and survival, linked to a lack of financial support from parents or guardians and often to a particular shock or crisis. In common with other interviewees, the *kayaye* workers' overwhelming difficulty regarding schooling concerned meeting the costs. Interviewees all expressed positive views about schooling and had wished to go further in their educations, indicating that *kayaye* is better understood as a consequence of school drop-out than a cause. Both dropping-out and

the necessity to migrate for work, however, are the result of inadequate livelihoods in northern Ghana. While poverty in general terms is widespread, it was found that *kayaye* workers had frequently experienced particular shocks likely to impact seriously on the household economy, in the forms including guardian mortality, old-age and bankruptcy. In addition, many had been fostered and experienced the characteristic difficulties of support associated therewith, particularly for girls. Both poverty and fosterage contribute to lower levels of meaningful access to schooling and are associated with over-age enrolment and drop-out, so that the trajectories leading to *kayaye* likely begin early in a child's life; while the point at which a child actually leaves school and subsequently migrates appears to have been linked to a shock creating a pressing need to earn a living in the cases of the interviewees. The requirement for self-sufficiency in difficult circumstances is not easily met in an area where livelihoods are dominated by subsistence agriculture, making migration one among few options. For girls, and especially fostered girls, the draw of *kayaye* is exacerbated by the need to acquire capital for 'marriage items' in order to resettle in the North. While many did cite this as a reason for migration, a wish to acquire capital and training for self-employment was an equally important rationale.

Analysis of national data in Chapters 4-6 has drawn attention to the considerable potential in Northern Ghana for an 'education-poverty trap' due to fragile livelihoods and both low access to, and low benefits from, education. The evidence presented in this chapter and the last shows that in the disadvantaged district of Savelugu-Nanton, the trap is indeed palpable. The constraints which prevent children gaining access to education levels with notable poverty-reducing benefits are formidable, despite recent policies to increase supply and reduce costs in relation to basic education. These constraints interact with cultural traditions so that the trap facing the most disadvantaged, particularly fostered children, is especially acute.

# CHAPTER NINE

# CONCLUSIONS AND RECOMMENDATIONS

This study has examined a number of relationships which form part of the nexus of linkages between educational investment and poverty reduction in the context of Ghana; with the intention of exploring the extent to which the conditions required for education to serve poverty reduction were satisfied, over the period from 1991 to 2006. The issue is of considerable importance, since it related to an important potential synergy, or conflict, between two key Millennium Development Goals (MDGs). The approach of the primary (quantitative) study has been to examine a system of co-determination, by interpreting the findings of several empirical models in the light of each other's results; and in combination with descriptive statistics and existing findings; to present a holistic picture of the patterns and trends which combine to shape the education-welfare relationship. While a number of the analyses which form part of the system produce new findings on particular relationships within the 'system' in the context of Ghana, the principal contribution of the study is the integrated picture of a system and its evolution over time. The secondary (qualitative) study provides an in-depth insight into issues surrounding the education-poverty relationship in the context of one deprived district. While the nature of the data and methodologies used in the two studies does not allow for triangulation or corroboration of findings, the two studies present convergent stories which emphasise the importance of context and locality in terms of the interactions between education and poverty. This is pursued in the qualitative work through an analysis of particular cultural phenomena – fosterage and *kayaye*, drawing attention to cultural specificity. This is clearly an unambiguous advantage of the collection of qualitative data, which necessarily exchanges breadth and generalisation for depth and particularity, and for understanding of causal relationships at the local level. A further key contribution of the study as a whole is thus the presentation of findings from two broad methodologies; within somewhat different paradigms; while addressing issues that are closely linked, alongside an attempt to combine and generate new insights

across conventional disciplinary boundaries. The approach is novel in relation to the issues investigated in Ghana, and more generally in developing countries. The use of a mixed-methods approach and the aim of examining a system of complex relationships, while appropriate for the research questions, and the issues under investigation, is at the same time a limitation of the study with respect to the detailed consideration of individual components of this system. For example, although new analysis of the returns to education in employment is provided through the use of GLSS 5, the study aims rather to generate these findings for the purpose of understanding their contribution to the wider relationships between education and welfare, rather than to advance methodologically the estimation of returns to education.

This chapter synthesises and summarises the contributions of the empirical analyses presented in Chapters Four to Eight, relating these to the research questions posed in Chapter One (Table 1.1). It includes a synthesis of these contributions so as to address the main and overarching research question and responds to sub-question 10 on the potential policy implications of the findings with regard to the joint goals of EFA and poverty reduction.

Chapter Four presents a more comprehensive and integrated descriptive picture of levels and trends in key education and welfare indicators than is currently available in the literature, and as a consequence is able to provide a fuller interpretation of concurrent processes. The reciprocal relationships between education and poverty, and their dynamics, depend on evolving patterns of educational access and quality, income growth and distribution, employment, returns to education, and demographic factors, among others considered in the chapter. Accordingly, it uses a range of data sources which are not elsewhere employed together (for example GLSS and EMIS data), to examine patterns and trends in educational access and welfare/poverty (research sub-questions 1 and 2). These are considered separately elsewhere (see GSS 2007a) for GLSS 3 and 4, but in the absence of a consideration of a number of intervening relationships which form part of the potential explanation of the interrelationships between these patterns/trends. For example, Chapter Four also includes descriptive analysis of the proportions of household incomes derived from key sources across household welfare groups, which are of considerable importance in understanding who benefits from the returns to education and from changes in these returns. It also

presents new descriptive analyses of school completion and progression rates, hours worked, employment status and earnings by education level, and children's participation in work, using GLSS 3-5 data.

The integrated picture of economic and educational change in the period 1991-2006 presented shows that despite large improvements in access to basic education, and an increased share of educational participation among the poorest at primary level, increases in consumption have substantially benefitted the better-off. While household size fell among richer groups, among the poorest it did not. Occupational groups which comprise better educated workers work more hours per week and more weeks per year. The share of the poorest in post-basic education participation has not improved, timely completion rates may even have worsened, and there is only weak evidence for improving quality, with differences in school quality between higher and lower income communities possibly widening. These indicative patterns are the subject of modelling exercises reported in Chapter Five. Further, the examination of dimensions of educational access in descriptive terms applies the CREATE analytic model, lending greater coherence to the patterns of exclusion and drawing attention to the much more limited gains achieved in educational access at later stages of access and progression.

Chapters Five and Six contain the findings and discussion relating to a set of empirical analyses intended to 'test' potential relationships identified in Chapter Four, relating to the co-determination between educational access and progress and welfare/poverty. The main contribution of the chapter is in linking these analyses in a holistic manner which is rarely attempted in the literature (one exception in the context of China is Knight et al 2008) and which has not been done in Ghana. These chapters augment the descriptive analyses in Chapter Four in relation to sub-research questions 1 and 2, by the use of regression modelling, for the purpose of improved inference regarding associations and potential causal relationships. In turn, this approach addresses sub-research questions 3 and 4, relating to the determinants of welfare/poverty and educational access and progression; and sub-questions 5 and 6, relating to the distribution of these effects. Specifically, these last questions concern the issue of which groups benefit most and least from the potentially poverty-reducing effects of education and the effects of economic advantage on educational outcomes.

Regression modelling using GLSS 5 data in relation to the questions posed in this study has not yet been done in literature, to the author's knowledge, so that this study updates current knowledge in published sources which employ GLSS 3 and 4 (e.g. Teal 2001; Kingdon and Soderbom 2007), to cover the period 1999-2006. The use of this latest survey shows, in particular, the continuation of a trend of declining benefits in earnings and consumption terms of lower levels of education and of rising benefits at higher levels. Further, quantile regression has not been used elsewhere to examine the benefits of education across the distribution of welfare. The findings that benefits do not differ widely by welfare group, but that poorer groups typically benefit relatively more from residence in more advantaged regions are therefore novel. The use of multi-level modelling to examine educational effects on welfare in Ghana is also not found in the literature; and this study finds that this methodology adds to available knowledge of the issues firstly by identifying the large variation in associations between education and welfare at the cluster level and secondly by identifying an association between cluster-level welfare and the availability of formal employment and the general level of education in the cluster, as well as, more weakly, with prevailing educational quality.

Chapters Five and Six also address sub-research question 7, concerning the importance of employment selection and of the distribution of income sources in the determination of welfare/poverty and the role of education in determining employment selection. They presents a fuller and more nuanced picture of selection effects, by examining them within region and for a full range of occupations. The key finding is that, while the benefits of education in wage employment are consistent and perhaps even higher in disadvantaged regions, regional effects on selection strongly favour the advantaged South. The welfare benefits of education to households reflect this by being lowest in the rural North, and among food farmers, especially those in the North. Nonetheless, the benefits of education regarding occupational selection and also within wage-employment are at least as great in the disadvantaged northern regions of the country; so that for the few who attain higher levels of education in these regions, the welfare gains are considerable. But within the least advantaged regions, the low level of opportunity outside of food farming, the poorest-paying occupation, is considered a primary reason for low consumption benefits of education, but at the same time for low levels of educational access beyond initial enrolment. The modelling of returns to education in employment and of associations between education and income from other sources,

alongside the factors associated with selection into various forms of income-earning activities, sheds light on the reasons for convexivity in consumption returns to education. While this convexivity is established in other work (e.g. Teal 2001), it is not explained in these terms; and studies which examine occupational selection (e.g. Kingdon and Soderbom 2007) do not relate this to consumption and poverty outcomes.

On the issue of educational participation, the study adds to and updates the limited exiting work in Ghana (Filmer 2007; Lavy 1996), including through the use of recent data (especially GLSS 5) and through the use of multinomial models to examine the full range of educational progression outcomes. An important finding is that at a national level, Ghana is very close to gender parity in initial enrolment terms. Also, the importance of regional differences in access to basic education has declined. Nonetheless, and crucially, access to post-basic education remains strongly associated with household welfare and socio-economic status, and these relationships appear to have strengthened over time.

The final sub-research question examined in Chapters Five and Six is question 9, concerning the identification of the system of linkages between educational access and progression and the economic benefits of education, and the implications for the poverty reducing potential of education; a question not examined explicitly in other studies. A synthesis of the findings suggests that substantial and poverty-reducing benefits of education are found only at the post-basic level of education, especially for later years in the period 1991-2006. The convex pattern of relationships between household education and welfare levels yields considerable benefits for those who progress to higher levels. However, the primary barrier to such progress consists in low levels of household welfare, largely because these levels of education are costly to access, despite being heavily subsidised. The human capital investment route out of poverty is found to be most clearly defined in the occupations associated with higher earnings, especially wage-employment. But these are the occupations in which the poor are least likely to be employed. For food-farmers in the North, a particularly disadvantaged group, the increases in welfare associated with basic education were found on average to be substantially insufficient to move a household out of extreme poverty in 2005/6. This is partly because the assumptions required for poverty-reduction through human capital investment are not adequately satisfied, owing to a weak link between education and

productivity and a dearth of opportunity in productive employment. Nonetheless, increases in initial educational access benefitted disadvantaged groups disproportionately over the period and increases in adult education may be expected to encourage higher enrolment and retention among children in future generations, subject to affordability constraints, leading to a potentially virtuous circle of educational access. However, while parental education is found to encourage enrolment, welfare and socio-economic status are found to be the primary determinants of progression, suggesting a countervailing vicious circle of intergenerational poverty transmission; to the extent that it is educational progress which is key to unlocking the economic benefits of education.

The historical education-gap in Ghana concerning levels of completion in basic education, which originated in unequal provision, is maintained and may be widening owing to unequal welfare levels. Moreover, differences in opportunity between regions means that the economic incentive to acquire education in the north and other disadvantaged areas may be lower than elsewhere; and given that incomes are also lower, the cost-benefit calculus of educational investment clearly favours advantaged regions. The potential for educational advancement to alleviate poverty among the worst-off in Ghana is thus limited firstly by affordability of access to the most valuable forms of education and secondly by economic opportunity; which in turn is a major reason for low levels of affordability. The situation may be described in terms of a 'education-poverty trap'. While education is found to play a potential role in decreasing absolute poverty by increasing welfare, it is also found to have contributed to increases in inequality and hence in relative poverty. Without attention to inequality of opportunity, the role of education in alleviating even absolute poverty for the most disadvantaged is found to be substantially limited. In the years ahead, exclusion from initial entry to school is likely to affect relatively few Ghanaian children, but this sense of universal access to education is somewhat minimal, especially in terms of likely poverty-reduction. Incomplete basic education and poor progression may be expected to affect considerably more children and exploitation of the synergy between the two goals of poverty eradication and universal basic education will require measures to target progression among the poor. While the findings are specific to Ghana, the pattern of educational expansion, especially through initiatives to promote free basic education in an environment of a lack of growth in opportunity for wage-employment may be observed in a number of other sub-Saharan African countries, for which the findings of

this study may have relevance. Uganda is perhaps an obvious example (see Deninger 2003), given its very dramatic growth in educational access following cost-reduction, but similarities may also be observed in Kenya, Tanzania and Malawi, among other countries.

Chapters Seven and Eight address sub-research question 8, relating to the role of contextual factors, including cultural beliefs and practices, in determining educational access and progression, in the context of a single deprived district, Savelugu-Nanton. There is relatively little work on these issues in the district to date, with notable exceptions, and in relation to the cultural issues, the work of Christine Oppong (Oppong 1966;1973;1977). This study updates and extends Oppong's work considerably, especially in the light of rapid increases in educational access. While many of the reasons for fosterage and some of the reasons for poor educational access cohere with Oppong's findings, the decline of traditional occupations and increased availability of schooling are found to have, somewhat ironically, emphasised some of the negative effects of fosterage, perhaps most significantly because of a potential conflict between the 'reciprocal' nature of the fosterage relationship and the requirements of schooling, especially the costs. The effects of fosterage on schooling, while ambiguous and indirect, are overall found to be negative. In particular, the 'Cinderella effect' of fosterage is notable, especially for girls, so that being fostered, even to more economically advantaged households, does not typically benefit the foster child educationally and on balance is associated with a worsening of educational 'chances'. *Kayaye* migration appears to be the result of a nexus of economic, social and cultural factors, beginning with low levels of opportunity in the north and with consequent poverty, but also including relative disadvantage, partly as a result of fosterage. Migration is sometimes catalysed by household shocks, including guardian mortality. These factors combine to result in dropping-out of school and in the need to earn income outside the household's existing livelihood activities. In addition, once schooling has ceased, for many girls, there is a need to acquire capital for marriage. Some also seek to acquire capital to work in self-employment, rather than return to low-paying food-farming in the North. The potential for an education-poverty trap is found to be especially notable in the rural north of Ghana and the practices of fosterage alongside the issue of migration to *kayaye* are found to be linked to poverty and poor educational access and progression in that context.

Further cost-reduction policies within and beyond the basic education phase, aimed at supporting retention and progression, perhaps targeted by region or poverty-level in a way that the Capitation Grant was not, or including 'conditional cash transfers' aimed at reducing opportunity costs could further reduce barriers due to affordability at the household level. The cost of post-basic education is high, however, so that reducing affordability barriers at this level, where substantial economic benefits begin to accrue, would incur considerable costs to the public purse. However, current education spending at the post-basic level is very strongly pro-rich. Greater cost-sharing between more advantaged households and government at senior secondary level and above would improve the equity of education spending and could release funds to support and target the post-basic education of less advantaged children, although it would raise difficult questions of means-testing. More generally, however, improvements in livelihoods and opportunities, especially among food-farmers in the North, will be required to sustain improvements in educational progression in the absence of anything other than very considerable subsidy to households. The findings of this study indicate that a vision of EFA which is pro-poor requires a fuller conceptualisation of educational opportunity and equity with regard to progression to higher levels of education.

General cost-reduction measures may nonetheless be expected to benefit disadvantaged children disproportionately, including foster children in Savelugu-Nanton, since for them, indirect costs continue to present a significant barrier to access at lower levels of education. The provision of free school uniforms, for example, has begun implementation in some deprived districts in Ghana and serves to reduce indirect costs. School-feeding and the provision of free school materials also serves this purpose, potentially increasing demand for education in the context of low incomes. In addition, measures to improve timely-enrolment might be expected to benefit poor children disproportionately, for example in the case of fostered boys by reducing age-grade-slippage and in the case of girls by reducing drop-out due to their approaching marriageable age. Improved pre-school provision, a current priority of the education ministry, has the potential to improve timely enrolment and recent statistics do show greater numbers of pupils in P1 at the expected age.

Further, the use of more flexible schooling timetables, recognising agricultural seasons and children's work commitments may also benefit the rural poor, including foster

children whose work may be more onerous and whose education may be a lower priority. Another potentially effective measure is the support of informal schooling alternatives such as the 'School for Life' model whereby school-drop-outs are provided vocationally oriented training which can be combined with work and which has also been associated with re-enrolment in conventional schools. Measures to improve school quality in rural areas and poor performing schools may also be expected to benefit the least advantaged children. However, further research is needed to develop a more nuanced understanding of important economic, social and cultural dimensions of life in disadvantaged areas such as Dagbon to better conceptualise how the challenges of educational access play out in poor rural communities with fragile economies and strong cultural values and traditions. Findings from this study indicate, for example, that the disadvantage suffered by fostered children results not from fosterage per se but from the forms of multiple and overlapping disadvantage associated with fostering in some, but not all cases.

Having made laudable progress with regard to expanding educational supply, basic schooling has been brought within reach of a vast majority of Ghanaian children. Both internationally and in Ghana, the discourse around EFA is rightly placing increasing emphasis on improving quality, one important way in which to promote sustainable demand. But since education is, in part at least, a positional good, expansion without comparable growth in economic opportunity (especially wage-labour) is likely to be attended with shrinking economic benefits, as has been observed in relation to basic education in Ghana. In the absence of measures to redistribute access to education and its benefits, the poor are potential losers. What is more, perceptions of low levels of benefit may 'feed-back' in the form of reducing demand among the least advantaged households. One important implication is that educational development relies somewhat on wider economic development and its distribution, and it is apparent that the benefits of respectable economic growth in Ghana during the period of this study have been shared least by the poorest groups. Another is that sustainable and equitable EFA policy requires distributional targeting. Polices are required to specifically improve not only initial access among the poor, but to improve their relative chances of progression to meaningful economic benefits of education. Targeted scholarship programmes are one such example. It is thus argued that the synergy between the joint MDGs of educational expansion and poverty reduction depends upon the poor capturing an adequate share of the economic benefits of such expansion, which in turn relies upon

improving access to post-basic somewhat more than basic schooling. While basic education is clearly a prerequisite, further policies designed to improve equitable access to higher levels of education are required.

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## APPENDIX A: Regression Tables

**Table A5.1: Correlations between household head's years of schooling and household welfare**

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Years of education | 0.033 | 0.010 | 0.027 | 0.056 |
| | (6.84)*** | (1.56) | (2.69)*** | (7.61)*** |
| Square of school years | 0.002 | 0.003 | 0.002 | 0.001 |
| | (6.25)*** | (5.00)*** | (3.00)*** | (2.39)** |
| GLSS4 | 0.137 | | | |
| | (3.53)*** | | | |
| GLSS5 | 0.252 | | | |
| | (8.35)*** | | | |
| Constant | 13.639 | 13.725 | 13.816 | 13.802 |
| | (556.96)*** | (905.39)*** | (313.49)*** | (384.62)*** |
| Observations | 19177 | 4514 | 5989 | 8674 |
| R-squared | 0.17 | 0.09 | 0.13 | 0.20 |

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

**Table A5.2: Correlations between household head's highest educational qualification and household welfare**

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Some education | 0.216 | 0.110 | 0.157 | 0.328 |
| | (8.99)*** | (2.87)*** | (3.17)*** | (9.03)*** |
| Primary | 0.343 | 0.145 | 0.313 | 0.479 |
| | (12.42)*** | (3.62)*** | (5.54)*** | (11.08)*** |
| Middle school certificate | 0.509 | 0.360 | 0.448 | 0.642 |
| | (18.85)*** | (10.86)*** | (7.46)*** | (15.79)*** |
| Vocational or commerce | 0.819 | 0.554 | 0.638 | 1.053 |
| | (14.78)*** | (6.18)*** | (6.59)*** | (12.54)*** |
| O Level | 0.782 | 0.667 | 0.761 | 0.872 |
| | (19.57)*** | (10.44)*** | (9.94)*** | (14.09)*** |
| SSS Certificate | 0.928 | 0.000 | 0.720 | 1.060 |
| | (16.30)*** | (.) | (6.03)*** | (15.56)*** |
| A Level | 1.120 | 1.089 | 1.106 | 1.149 |
| | (19.62)*** | (13.05)*** | (10.52)*** | (12.58)*** |
| Teacher Training A | 0.868 | 0.206 | 0.889 | 0.987 |
| | (10.63)*** | (0.72) | (2.59)*** | (11.24)*** |
| Teacher Training B | 0.598 | 0.313 | 0.503 | 1.073 |
| | (11.32)*** | (4.57)*** | (5.58)*** | (12.21)*** |
| Technical/professional certificate | 0.827 | 0.368 | 0.779 | 0.983 |
| | (16.86)*** | (2.94)*** | (8.53)*** | (15.29)*** |
| Technical/professional diploma | 1.078 | 0.877 | 1.095 | 1.161 |
| | (13.10)*** | (4.14)*** | (6.72)*** | (11.36)*** |
| Bachelor's degree | 1.291 | 1.260 | 0.988 | 1.456 |
| | (17.72)*** | (7.01)*** | (9.60)*** | (15.44)*** |
| Master's degree | 1.599 | 1.028 | 1.568 | 1.832 |
| | (9.57)*** | (3.92)*** | (7.44)*** | (8.55)*** |
| Doctorate | 1.925 | 0.945 | 0.000 | 2.390 |
| | (6.25)*** | (3.67)*** | (.) | (7.27)*** |
| GLSS4 | 0.128 | | | |
| | (3.27)*** | | | |
| GLSS5 | 0.240 | | | |
| | (7.98)*** | | | |
| Constant | 13.632 | 13.725 | 13.802 | 13.778 |
| | (555.33)*** | (485.61)*** | (286.59)*** | (379.52)*** |
| Observations | 19188 | 4516 | 5990 | 8682 |
| R-squared | 0.18 | 0.10 | 0.14 | 0.21 |

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Estimation method: OLS

## Table A5.4: Descriptive statistics (means and standard deviations)

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Log of household welfare | 14.051 | 13.917 | 14.067 | 14.112 |
| | (0.82) | (0.71) | (0.75) | (0.92) |
| Some education | 0.100 | 0.101 | 0.095 | 0.102 |
| | (0.30) | (0.30) | (0.29) | (0.30) |
| Primary | 0.108 | 0.103 | 0.108 | 0.111 |
| | (0.31) | (0.30) | (0.31) | (0.31) |
| Middle school certificate | 0.297 | 0.282 | 0.317 | 0.290 |
| | (0.46) | (0.45) | (0.47) | (0.45) |
| Vocational or commerce | 0.014 | 0.013 | 0.013 | 0.014 |
| | (0.12) | (0.11) | (0.11) | (0.12) |
| O Level | 0.033 | 0.039 | 0.041 | 0.023 |
| | (0.18) | (0.19) | (0.20) | (0.15) |
| SSS Certificate | 0.014 | 0.000 | 0.007 | 0.026 |
| | (0.12) | (0.00) | (0.08) | (0.16) |
| A Level | 0.009 | 0.009 | 0.013 | 0.007 |
| | (0.10) | (0.09) | (0.11) | (0.08) |
| Teacher Training A | 0.004 | 0.001 | 0.001 | 0.008 |
| | (0.07) | (0.03) | (0.04) | (0.09) |
| Teacher Training B | 0.014 | 0.017 | 0.022 | 0.006 |
| | (0.12) | (0.13) | (0.15) | (0.08) |
| Technical/professional certificate | 0.016 | 0.006 | 0.018 | 0.020 |
| | (0.13) | (0.08) | (0.13) | (0.14) |
| Technical/professional diploma | 0.009 | 0.006 | 0.011 | 0.011 |
| | (0.10) | (0.07) | (0.10) | (0.10) |
| Bachelor's degree | 0.007 | 0.005 | 0.005 | 0.011 |
| | (0.09) | (0.07) | (0.07) | (0.10) |
| Master's degree | 0.002 | 0.002 | 0.001 | 0.003 |
| | (0.04) | (0.04) | (0.03) | (0.05) |
| Doctorate | 0.000 | 0.000 | 0.000 | 0.001 |
| | (0.02) | (0.02) | (0.00) | (0.02) |
| Urban | 0.374 | 0.349 | 0.366 | 0.394 |
| | (0.48) | (0.48) | (0.48) | (0.49) |
| % household who are girls aged 7-14 | 8.769 | 8.978 | 9.874 | 7.851 |
| | (13.80) | (13.56) | (14.81) | (13.10) |
| Equivalent adults (household size) | 3.277 | 3.331 | 3.327 | 3.210 |
| | (2.08) | (2.10) | (1.99) | (2.13) |
| % household who are boys aged 7-14 | 8.985 | 9.437 | 9.677 | 8.234 |
| | (14.13) | (14.14) | (14.66) | (13.69) |
| % household who are over 59 years | 10.876 | 9.918 | 11.672 | 10.822 |
| | (24.91) | (23.90) | (25.35) | (25.10) |
| % household who are male adults | 38.966 | 43.831 | 43.809 | 32.778 |
| | (32.61) | (32.71) | (31.38) | (32.38) |
| % household who are under 7 years | 16.692 | 19.109 | 16.165 | 15.750 |
| | (19.26) | (19.90) | (18.99) | (18.98) |
| Acres of land | 0.471 | 0.359 | 0.463 | 0.539 |
| | (4.46) | (3.20) | (5.62) | (4.08) |
| Migrant | 0.300 | 0.253 | 0.407 | 0.247 |
| | (0.46) | (0.43) | (0.49) | (0.43) |
| Age in years | 45.292 | 44.298 | 45.843 | 45.437 |
| | (15.50) | (15.32) | (15.38) | (15.67) |
| Square of age | 2,291.646 | 2,196.875 | 2,338.002 | 2,309.899 |
| | (1570.80) | (1525.45) | (1564.37) | (1597.76) |
| Male head | 0.693 | 0.678 | 0.664 | 0.721 |
| | (0.46) | (0.47) | (0.47) | (0.45) |
| GLSS4 | 0.320 | 0.000 | 1.000 | 0.000 |
| | (0.47) | (0.00) | (0.00) | (0.00) |
| GLSS5 | 0.440 | 0.000 | 0.000 | 1.000 |
| | (0.50) | (0.00) | (0.00) | (0.00) |
| Observations | 18735 | 4514 | 5986 | 8235 |

Source: Variables computed/extracted from GLSS 3-5

**Table A5.5: Ordered probit: Household poverty status**

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Some education | 0.114 | 0.026 | 0.234 | 0.109 |
| | (2.82)*** | (0.36) | (2.94)*** | (1.75)* |
| Primary | 0.140 | -0.094 | 0.201 | 0.216 |
| | (3.52)*** | (-1.31) | (2.57)** | (3.37)*** |
| Middle school certificate | 0.368 | 0.267 | 0.414 | 0.395 |
| | (11.49)*** | (4.63)*** | (6.62)*** | (7.57)*** |
| Vocational or commerce | 0.460 | 0.676 | 0.555 | 0.298 |
| | (3.67)*** | (2.95)*** | (2.36)** | (1.47) |
| O Level | 0.615 | 0.422 | 0.685 | 0.755 |
| | (7.43)*** | (3.18)*** | (4.54)*** | (4.41)*** |
| SSS Certificate | 0.616 | | 0.233 | 0.840 |
| | (4.16)*** | | (0.91) | (4.63)*** |
| A Level | 1.513 | 1.095 | 1.842 | 7.317 |
| | (5.11)*** | (2.78)*** | (2.64)*** | (66.56)*** |
| Teacher Training A | 1.008 | -0.838 | 0.255 | 1.465 |
| | (4.72)*** | (-1.40) | (0.34) | (6.44)*** |
| Teacher Training B | 0.873 | 0.582 | 0.915 | 1.628 |
| | (8.41)*** | (3.28)*** | (6.08)*** | (4.58)*** |
| Technical/professional cert | 1.006 | 0.257 | 1.104 | 1.248 |
| | (8.17)*** | (0.91) | (5.80)*** | (5.38)*** |
| Technical/professional dip | 1.165 | 1.338 | 1.290 | 1.102 |
| | (5.77)*** | (3.08)*** | (3.55)*** | (3.75)*** |
| Bachelor's degree | 1.895 | 7.960 | 1.238 | 8.672 |
| | (6.22)*** | (62.37)*** | (3.53)*** | (49.69)*** |
| Master's degree | 8.300 | 8.702 | 7.730 | 8.370 |
| | (76.93)*** | (48.99)*** | (51.07)*** | (53.56)*** |
| Doctorate | 9.113 | 9.175 | | 6.897 |
| | (61.51)*** | (43.62)*** | | (48.39)*** |
| Cut1 | -0.695 | -0.991 | -1.347 | -0.560 |
| | (-5.29)*** | (-4.16)*** | (-5.04)*** | (-2.67)*** |
| Cut2 | -0.238 | -0.501 | -0.887 | -0.087 |
| | (-1.82)* | (-2.10)** | (-3.32)*** | (-0.42) |
| Observations | 18735 | 4514 | 5986 | 8235 |
| Pseudo R-squared | 0.235 | 0.197 | 0.245 | 0.295 |

Robust z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

Controls included for household size, assets and composition and for contextual effects/survey round

**Table A5.6: Marginal effects (at the mean) on the probability of household poverty outcomes (pooled)**

| VARIABLES | Extremely Poor | Poor | Non-Poor |
|---|---|---|---|
| Some education | -0.0217766 | -0.0123479 | 0.0341244 |
| Primary | -0.0264226 | -0.0151346 | 0.0415572 |
| Middle school certificate | -0.0684201 | -0.0395358 | 0.107956 |
| Vocational or commerce | -0.070187 | -0.0480467 | 0.1182337 |
| O Level | -0.0866448 | -0.0624086 | 0.1490534 |
| SSS Certificate | -0.0852521 | -0.0621902 | 0.1474423 |
| A Level | -0.1203501 | -0.1086624 | 0.2290124 |
| Teacher Training A | -0.1073734 | -0.0891929 | 0.1965663 |
| Teacher Training B | -0.1026548 | -0.0815338 | 0.1841886 |
| Technical/professional cert. | -0.1095051 | -0.0897931 | 0.1992983 |
| Technical/professional dip. | -0.1136665 | -0.0972191 | 0.2108856 |
| Bachelor's degree | -0.1233704 | -0.1149173 | 0.2382877 |
| Master's degree | -0.1241935 | -0.1183656 | 0.2425591 |
| Doctorate | -0.1220096 | -0.1172092 | 0.2392188 |
| Western | -0.137456 | -0.1061769 | 0.2436329 |
| Central | -0.1292347 | -0.0985725 | 0.2278072 |
| Greater Accra | -0.1479865 | -0.1118657 | 0.2598521 |
| Volta | -0.1190314 | -0.0886118 | 0.2076432 |
| Eastern | -0.1355453 | -0.1016366 | 0.2371819 |
| Ashanti | -0.1578007 | -0.1131947 | 0.2709954 |
| Brong Ahafo | -0.1160529 | -0.0862867 | 0.2023396 |
| Northern | -0.0759521 | -0.0505027 | 0.1264548 |
| Upper West | -0.0109319 | -0.0060533 | 0.0169851 |
| Urban | -0.1251902 | -0.0708012 | 0.1959914 |
| GLSS4 | -0.0471523 | -0.0266061 | 0.0737584 |
| GLSS5 | -0.0548874 | -0.0297944 | 0.0846818 |

## Table A5.7: Household welfare and education (OLS) (full set of control variables shown)

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Years of education | -0.007 | -0.007 | -0.001 | -0.005 |
| | (-2.44)** | (-1.36) | (-0.22) | (-1.15) |
| Square of school years | 0.003 | 0.002 | 0.002 | 0.003 |
| | (15.04)*** | (6.01)*** | (6.04)*** | (11.46)*** |
| Western | 0.639 | 0.402 | 0.700 | 0.725 |
| | (23.84)*** | (7.08)*** | (12.89)*** | (19.36)*** |
| Central | 0.594 | 0.577 | 0.456 | 0.709 |
| | (22.11)*** | (10.00)*** | (8.29)*** | (19.23)*** |
| Greater Accra | 0.654 | 0.518 | 0.840 | 0.633 |
| | (23.86)*** | (8.63)*** | (15.51)*** | (16.32)*** |
| Volta | 0.498 | 0.438 | 0.445 | 0.561 |
| | (18.46)*** | (7.80)*** | (7.61)*** | (14.92)*** |
| Eastern | 0.561 | 0.424 | 0.474 | 0.653 |
| | (21.07)*** | (7.31)*** | (8.48)*** | (18.13)*** |
| Ashanti | 0.711 | 0.611 | 0.818 | 0.712 |
| | (28.10)*** | (10.69)*** | (15.48)*** | (21.19)*** |
| Brong Ahafo | 0.493 | 0.420 | 0.592 | 0.461 |
| | (18.69)*** | (7.43)*** | (10.95)*** | (12.60)*** |
| Northern | 0.291 | 0.311 | 0.198 | 0.306 |
| | (10.20)*** | (5.05)*** | (3.43)*** | (8.11)*** |
| Upper West | 0.004 | 0.369 | -0.153 | -0.334 |
| | (0.12) | (5.45)*** | (-2.65)*** | (-7.79)*** |
| Urban | 0.375 | 0.439 | 0.240 | 0.436 |
| | (34.91)*** | (21.88)*** | (12.21)*** | (27.07)*** |
| Proportion girls aged 7-14 | -0.004 | -0.005 | -0.004 | -0.003 |
| | (-10.91)*** | (-8.44)*** | (-7.50)*** | (-4.88)*** |
| Equivalent adults (household size) | -0.115 | -0.108 | -0.119 | -0.119 |
| | (-32.94)*** | (-17.70)*** | (-19.68)*** | (-21.78)*** |
| Proportion boys aged 7-14 | -0.005 | -0.006 | -0.005 | -0.004 |
| | (-11.90)*** | (-10.27)*** | (-8.29)*** | (-5.72)*** |
| Proportion over 59 years | 0.001 | 0.000 | 0.000 | 0.001 |
| | (1.89)* | (0.44) | (0.73) | (2.15)** |
| Proportion of male adults | -0.001 | -0.001 | -0.002 | 0.000 |
| | (-2.54)** | (-2.97)*** | (-4.11)*** | (0.41) |
| Proportion under 7 years | -0.005 | -0.006 | -0.006 | -0.005 |
| | (-17.98)*** | (-12.03)*** | (-10.95)*** | (-10.11)*** |
| Acres of land | 0.004 | 0.001 | 0.002 | 0.009 |
| | (2.90)*** | (0.42) | (2.14)** | (2.74)*** |
| Migrant | 0.039 | -0.005 | 0.079 | 0.082 |
| | (3.68)*** | (-0.24) | (3.45)*** | (5.00)*** |
| Number of large animals | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.32) | (6.44)*** | (4.91)*** | (1.05) |
| Number of small animals | 0.000 | 0.000 | 0.001 | 0.000 |
| | (1.27) | (0.87) | (2.27)** | (0.89) |
| Age in years | -0.003 | -0.003 | -0.006 | -0.002 |
| | (-1.81)* | (-1.09) | (-1.67)* | (-0.57) |
| Square of age | 0.000 | 0.000 | 0.000 | -0.000 |
| | (0.10) | (0.54) | (0.71) | (-0.90) |
| Male head | -0.071 | -0.034 | -0.004 | -0.139 |
| | (-4.96)*** | (-1.17) | (-0.17) | (-6.40)*** |
| GLSS4 | 0.137 | | | |
| | (11.55)*** | | | |
| GLSS5 | 0.182 | | | |
| | (15.81)*** | | | |
| Constant | 13.893 | 13.953 | 14.120 | 13.976 |
| | (278.73)*** | (155.45)*** | (144.69)*** | (192.47)*** |
| Observations | 18728 | 4512 | 5985 | 8231 |
| Adjusted R-squared | 0.50 | 0.43 | 0.50 | 0.55 |

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

**Table A5.8: Household welfare and household head's highest educational qualification (OLS)**

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Some education | 0.058 | 0.013 | 0.057 | 0.102 |
| | (3.42)*** | (0.44) | (1.91)* | (3.80)*** |
| Primary | 0.117 | 0.030 | 0.124 | 0.151 |
| | (6.93)*** | (1.03) | (3.84)*** | (6.01)*** |
| Middle school certificate | 0.226 | 0.194 | 0.207 | 0.255 |
| | (16.80)*** | (8.37)*** | (8.26)*** | (12.05)*** |
| Vocational or commerce | 0.372 | 0.273 | 0.273 | 0.468 |
| | (9.17)*** | (3.73)*** | (4.21)*** | (7.28)*** |
| O Level | 0.397 | 0.314 | 0.400 | 0.452 |
| | (14.69)*** | (6.95)*** | (9.41)*** | (8.76)*** |
| SSS Certificate | 0.367 | 0.000 | 0.064 | 0.457 |
| | (9.09)*** | (.) | (0.86) | (9.96)*** |
| A Level | 0.611 | 0.645 | 0.592 | 0.585 |
| | (15.52)*** | (8.61)*** | (9.49)*** | (8.94)*** |
| Teacher Training A | 0.605 | -0.085 | 0.509 | 0.650 |
| | (10.19)*** | (-0.52) | (2.23)** | (10.40)*** |
| Teacher Training B | 0.450 | 0.280 | 0.437 | 0.628 |
| | (12.65)*** | (4.75)*** | (8.03)*** | (11.06)*** |
| Technical/professional certificate | 0.513 | 0.247 | 0.471 | 0.576 |
| | (15.18)*** | (2.58)*** | (9.70)*** | (11.16)*** |
| Technical/professional diploma | 0.744 | 0.662 | 0.797 | 0.726 |
| | (13.13)*** | (5.25)*** | (7.41)*** | (10.65)*** |
| Bachelor's degree | 0.924 | 0.783 | 0.643 | 1.053 |
| | (18.26)*** | (5.59)*** | (7.61)*** | (17.16)*** |
| Master's degree | 1.240 | 0.777 | 1.115 | 1.450 |
| | (9.76)*** | (4.51)*** | (14.30)*** | (8.37)*** |
| Doctorate | 1.470 | 1.095 | 0.000 | 1.548 |
| | (5.10)*** | (1.80)* | (.) | (5.71)*** |
| Constant | 13.865 | 13.969 | 14.143 | 13.879 |
| | (275.95)*** | (156.30)*** | (143.69)*** | (187.89)*** |
| Observations | 18735 | 4514 | 5986 | 8235 |
| Adjusted R-squared | 0.50 | 0.44 | 0.50 | 0.55 |

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls included for household size, assets and composition and for contextual effects/survey round

**Table A5.9: Quantile Regression: Household welfare and household head's years of education (pooled surveys)**

| VARIABLES | q20 | q40 | q60 | q80 |
|---|---|---|---|---|
| Years of education | -0.006 | -0.005 | -0.005 | -0.006 |
| | (-1.44) | (-1.82)* | (-1.42) | (-1.43) |
| Square of school years | 0.003 | 0.003 | 0.003 | 0.003 |
| | (9.40)*** | (12.39)*** | (11.61)*** | (10.61)*** |
| Western | 0.724 | 0.658 | 0.608 | 0.592 |
| | (17.85)*** | (25.42)*** | (16.85)*** | (20.40)*** |
| Central | 0.647 | 0.597 | 0.578 | 0.567 |
| | (15.72)*** | (25.28)*** | (19.36)*** | (21.37)*** |
| Greater Accra | 0.730 | 0.680 | 0.611 | 0.599 |
| | (16.11)*** | (21.32)*** | (19.05)*** | (17.61)*** |
| Volta | 0.553 | 0.490 | 0.423 | 0.455 |
| | (15.03)*** | (20.15)*** | (14.17)*** | (14.81)*** |
| Eastern | 0.612 | 0.574 | 0.539 | 0.528 |
| | (15.05)*** | (22.66)*** | (15.73)*** | (21.52)*** |
| Ashanti | 0.782 | 0.719 | 0.683 | 0.630 |
| | (19.29)*** | (26.08)*** | (25.19)*** | (30.83)*** |
| Brong Ahafo | 0.607 | 0.521 | 0.462 | 0.450 |
| | (15.09)*** | (21.95)*** | (17.55)*** | (17.08)*** |
| Northern | 0.234 | 0.246 | 0.307 | 0.413 |
| | (6.69)*** | (11.22)*** | (11.32)*** | (13.28)*** |
| Upper West | -0.227 | -0.184 | -0.122 | 0.009 |
| | (-3.83)*** | (-4.49)*** | (-3.43)*** | (0.22) |
| Urban | 0.375 | 0.392 | 0.409 | 0.408 |
| | (35.61)*** | (45.84)*** | (39.73)*** | (31.33)*** |
| migrant | 0.015 | 0.037 | 0.052 | 0.035 |
| | (1.01) | (2.98)*** | (4.45)*** | (3.80)*** |
| | (0.71) | (1.34) | (-0.17) | (0.21) |
| Male | -0.032 | -0.061 | -0.090 | -0.122 |
| | (-1.76)* | (-3.44)*** | (-5.89)*** | (-7.85)*** |
| GLSS4 | 0.119 | 0.123 | 0.117 | 0.117 |
| | (9.01)*** | (8.69)*** | (8.68)*** | (7.18)*** |
| GLSS5 | 0.145 | 0.161 | 0.172 | 0.179 |
| | (9.33)*** | (9.04)*** | (10.51)*** | (10.30)*** |
| Constant | 13.404 | 13.756 | 14.003 | 14.322 |
| | (142.98)*** | (209.81)*** | (310.35)*** | (206.25)*** |
| Observations | 18728 | 18728 | 18728 | 18728 |

t statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls included for household size, assets and composition.

**Table A5.10: Quantile Regression: Household welfare and household head's years of education (GLSS 3)**

| VARIABLES | q20 | q40 | q60 | q80 |
|---|---|---|---|---|
| Years of education | -0.010 | -0.005 | -0.011 | -0.003 |
| | (-1.20) | (-0.57) | (-1.60) | (-0.27) |
| Square of school years | 0.003 | 0.002 | 0.003 | 0.002 |
| | (4.33)*** | (3.47)*** | (6.26)*** | (3.45)*** |
| Western | 0.477 | 0.434 | 0.381 | 0.307 |
| | (7.94)*** | (5.41)*** | (6.99)*** | (4.10)*** |
| Central | 0.603 | 0.555 | 0.570 | 0.576 |
| | (10.82)*** | (6.49)*** | (9.76)*** | (6.92)*** |
| Greater Accra | 0.519 | 0.488 | 0.488 | 0.479 |
| | (8.40)*** | (5.58)*** | (8.27)*** | (6.30)*** |
| Volta | 0.515 | 0.416 | 0.362 | 0.348 |
| | (7.73)*** | (5.05)*** | (5.48)*** | (4.18)*** |
| Eastern | 0.455 | 0.425 | 0.389 | 0.413 |
| | (5.81)*** | (5.29)*** | (8.12)*** | (6.08)*** |
| Ashanti | 0.644 | 0.600 | 0.583 | 0.592 |
| | (8.69)*** | (7.26)*** | (11.99)*** | (8.69)*** |
| Brong Ahafo | 0.519 | 0.429 | 0.353 | 0.280 |
| | (7.31)*** | (5.49)*** | (7.28)*** | (3.52)*** |
| Northern | 0.189 | 0.342 | 0.385 | 0.456 |
| | (2.16)** | (4.14)*** | (6.31)*** | (7.13)*** |
| Upper West | 0.233 | 0.354 | 0.453 | 0.490 |
| | (2.51)** | (5.02)*** | (5.40)*** | (6.07)*** |
| Urban | 0.457 | 0.450 | 0.425 | 0.454 |
| | (17.17)*** | (25.15)*** | (13.32)*** | (13.20)*** |
| Constant | 13.486 | 13.739 | 14.130 | 14.481 |
| | (110.88)*** | (100.84)*** | (134.42)*** | (83.10)*** |
| Observations | 4512 | 4512 | 4512 | 4512 |

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls included for household size, assets and composition.

**Table A5.11: Quantile Regression: Household welfare and household head's years of education (GLSS 4)**

| VARIABLES | q20 | q40 | q60 | q80 |
|---|---|---|---|---|
| Years of education | -0.003 | -0.003 | 0.001 | -0.001 |
| | (-0.45) | (-0.66) | (0.21) | (-0.18) |
| Square of school years | 0.002 | 0.002 | 0.002 | 0.002 |
| | (5.14)*** | (6.43)*** | (4.95)*** | (3.80)*** |
| Western | 0.661 | 0.630 | 0.697 | 0.828 |
| | (10.14)*** | (21.78)*** | (14.16)*** | (11.83)*** |
| Central | 0.372 | 0.358 | 0.416 | 0.509 |
| | (7.04)*** | (7.88)*** | (8.11)*** | (7.03)*** |
| Greater Accra | 0.783 | 0.722 | 0.778 | 0.843 |
| | (11.04)*** | (13.38)*** | (15.79)*** | (10.32)*** |
| Volta | 0.212 | 0.252 | 0.358 | 0.542 |
| | (2.61)*** | (3.78)*** | (6.34)*** | (7.69)*** |
| Eastern | 0.357 | 0.361 | 0.455 | 0.559 |
| | (5.05)*** | (7.40)*** | (10.98)*** | (7.29)*** |
| Ashanti | 0.650 | 0.647 | 0.698 | 0.770 |
| | (11.96)*** | (15.85)*** | (15.69)*** | (11.76)*** |
| Brong Ahafo | 0.555 | 0.480 | 0.528 | 0.650 |
| | (8.60)*** | (8.75)*** | (8.56)*** | (7.75)*** |
| Northern | 0.054 | 0.079 | 0.206 | 0.398 |
| | (0.88) | (1.67)* | (5.12)*** | (4.81)*** |
| Upper West | -0.246 | -0.237 | -0.206 | -0.168 |
| | (-3.25)*** | (-5.92)*** | (-3.44)*** | (-2.11)** |
| Urban | 0.195 | 0.240 | 0.233 | 0.251 |
| | (9.19)*** | (10.78)*** | (8.22)*** | (6.86)*** |
| Constant | 13.636 | 13.961 | 14.244 | 14.511 |
| | (134.67)*** | (160.00)*** | (119.47)*** | (117.08)*** |
| Observations | 5985 | 5985 | 5985 | 5985 |

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Controls included for household size, assets and composition.

**Table A5.12: Quantile Regression: Household welfare and household head's years of education (GLSS 5)**

| VARIABLES | q20 | q40 | q60 | q80 |
|---|---|---|---|---|
| schoolyears | -0.002 | 0.001 | -0.004 | -0.005 |
| | (-0.32) | (0.20) | (-0.79) | (-0.73) |
| schoolyearssq | 0.003 | 0.003 | 0.003 | 0.003 |
| | (7.08)*** | (10.03)*** | (11.09)*** | (8.25)*** |
| Western | 0.778 | 0.677 | 0.691 | 0.613 |
| | (24.66)*** | (19.12)*** | (15.28)*** | (11.95)*** |
| Central | 0.840 | 0.719 | 0.667 | 0.602 |
| | (27.54)*** | (21.19)*** | (17.52)*** | (14.61)*** |
| Greater Accra | 0.667 | 0.573 | 0.585 | 0.535 |
| | (15.87)*** | (12.22)*** | (13.31)*** | (11.26)*** |
| Volta | 0.631 | 0.513 | 0.511 | 0.480 |
| | (17.67)*** | (12.72)*** | (14.46)*** | (10.38)*** |
| Eastern | 0.741 | 0.641 | 0.660 | 0.588 |
| | (20.96)*** | (24.26)*** | (16.70)*** | (15.42)*** |
| Ashanti | 0.811 | 0.682 | 0.687 | 0.590 |
| | (22.52)*** | (18.53)*** | (18.68)*** | (15.48)*** |
| Brong Ahafo | 0.539 | 0.459 | 0.463 | 0.430 |
| | (13.24)*** | (11.12)*** | (9.39)*** | (10.42)*** |
| Northern | 0.239 | 0.221 | 0.285 | 0.341 |
| | (6.00)*** | (4.73)*** | (5.24)*** | (7.13)*** |
| Upper West | -0.355 | -0.382 | -0.315 | -0.316 |
| | (-6.82)*** | (-9.31)*** | (-5.76)*** | (-4.38)*** |
| Urban | 0.475 | 0.498 | 0.521 | 0.487 |
| | (16.68)*** | (20.58)*** | (22.09)*** | (25.86)*** |
| Constant | 13.579 | 13.960 | 14.082 | 14.361 |
| | (203.50)*** | (205.11)*** | (252.47)*** | (166.05)*** |
| Observations | 8231 | 8231 | 8231 | 8231 |

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Controls included for household size, assets and composition.

**Table A5.13: Household welfare and household head's years of schooling (cluster fixed effects)**

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Years of education | -0.007 | -0.005 | -0.003 | -0.009 |
| | (-2.95)*** | (-0.96) | (-0.57) | (-2.50)** |
| Square of school years | 0.002 | 0.002 | 0.002 | 0.003 |
| | (15.13)*** | (4.26)*** | (5.63)*** | (10.68)*** |
| Constant | 14.631 | 14.567 | 14.688 | 14.605 |
| | (372.81)*** | (196.46)*** | (200.69)*** | (253.65)*** |
| Observations | 18736 | 4515 | 5986 | 8235 |
| Number of clusters | 1229 | 365 | 300 | 564 |
| Adjusted R-squared | 0.32 | 0.35 | 0.31 | 0.34 |

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls included for household size, assets and composition and for contextual effects/survey round

**Table A5.14: Household welfare and household head's highest educational achievement (cluster fixed effects)**

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Some education | 0.051 | 0.012 | 0.077 | 0.055 |
| | (3.46)*** | (0.44) | (2.67)*** | (2.65)*** |
| Primary | 0.074 | 0.015 | 0.119 | 0.076 |
| | (5.02)*** | (0.52) | (4.25)*** | (3.59)*** |
| Middle school cert | 0.173 | 0.160 | 0.179 | 0.178 |
| | (13.68)*** | (6.99)*** | (7.13)*** | (9.89)*** |
| Vocational or commerce | 0.305 | 0.252 | 0.238 | 0.360 |
| | (7.72)*** | (3.65)*** | (3.29)*** | (6.06)*** |
| O Level | 0.298 | 0.239 | 0.324 | 0.291 |
| | (11.59)*** | (4.65)*** | (7.96)*** | (6.38)*** |
| SSS Cert | 0.220 | 0.000 | 0.037 | 0.283 |
| | (5.91)*** | (.) | (0.54) | (6.74)*** |
| A Level | 0.523 | 0.562 | 0.478 | 0.534 |
| | (13.43)*** | (7.17)*** | (9.50)*** | (6.46)*** |
| Teacher Training A | 0.516 | -0.107 | 0.420 | 0.585 |
| | (8.28)*** | (-0.86) | (3.52)*** | (8.80)*** |
| Teacher Training B | 0.366 | 0.210 | 0.381 | 0.528 |
| | (10.31)*** | (3.93)*** | (7.11)*** | (7.34)*** |
| Technical/professional cert | 0.391 | 0.175 | 0.381 | 0.449 |
| | (11.59)*** | (1.65) | (6.68)*** | (10.07)*** |
| Technical/professional dip | 0.614 | 0.538 | 0.747 | 0.552 |
| | (10.01)*** | (4.29)*** | (5.97)*** | (8.43)*** |
| Bachelor degree | 0.710 | 0.615 | 0.512 | 0.828 |
| | (13.40)*** | (4.79)*** | (5.63)*** | (12.62)*** |
| Master's degree | 0.973 | 0.586 | 1.064 | 1.119 |
| | (7.12)*** | (2.55)** | (7.63)*** | (6.30)*** |
| Doctorate | 1.193 | 1.079 | 0.000 | 1.200 |
| | (5.28)*** | (2.38)** | (.) | (5.61)*** |
| | (-1.81)* | (-0.03) | (0.32) | (-3.08)*** |
| Constant | 14.620 | 14.564 | 14.692 | 14.596 |
| | (358.41)*** | (188.74)*** | (193.28)*** | (243.38)*** |
| Observations | 18735 | 4514 | 5986 | 8235 |
| Number of clusters | 1229 | 365 | 300 | 564 |
| Adjusted R-squared | 0.33 | 0.36 | 0.32 | 0.34 |

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls included for household size, assets and composition and for contextual effects/survey round

**Table A5.16: Household welfare: 'Between cluster' effects of household heads' years of schooling**

| VARIABLES | Pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Years of education | -0.026 | -0.039 | -0.022 | 0.008 |
| | (-1.55) | (-1.28) | (-0.54) | (0.34) |
| Square of school years | 0.006 | 0.006 | 0.005 | 0.004 |
| | (5.30)*** | (2.34)** | (1.52) | (2.90)*** |
| Western | 0.491 | 0.399 | 0.510 | 0.479 |
| | (7.26)*** | (2.98)*** | (3.24)*** | (5.16)*** |
| Central | 0.532 | 0.593 | 0.304 | 0.538 |
| | (7.97)*** | (4.50)*** | (1.99)** | (5.77)*** |
| Greater Accra | 0.462 | 0.530 | 0.529 | 0.300 |
| | (6.59)*** | (3.73)*** | (3.30)*** | (3.11)*** |
| Volta | 0.401 | 0.481 | 0.015 | 0.420 |
| | (5.99)*** | (3.71)*** | (0.09) | (4.65)*** |
| Eastern | 0.446 | 0.431 | 0.058 | 0.459 |
| | (6.57)*** | (3.35)*** | (0.32) | (5.02)*** |
| Ashanti | 0.542 | 0.576 | 0.516 | 0.482 |
| | (8.36)*** | (4.35)*** | (3.30)*** | (5.54)*** |
| Brong Ahafo | 0.377 | 0.355 | 0.398 | 0.284 |
| | (5.74)*** | (2.75)*** | (2.51)** | (3.16)*** |
| Northern | 0.249 | 0.264 | 0.170 | 0.247 |
| | (3.97)*** | (2.19)** | (1.14) | (3.06)*** |
| Upper West | -0.098 | 0.373 | -0.081 | -0.356 |
| | (-1.46) | (2.96)*** | (-0.48) | (-3.91)*** |
| Urban | 0.287 | 0.358 | 0.116 | 0.309 |
| | (10.17)*** | (7.81)*** | (2.32)** | (7.11)*** |
| migrant | 0.062 | 0.019 | 0.374 | 0.239 |
| | (1.47) | (0.23) | (3.49)*** | (3.11)*** |
| Male | -0.449 | -0.368 | 0.036 | -0.768 |
| | (-4.48)*** | (-2.10)** | (0.18) | (-4.95)*** |
| GLSS4 | 0.076 | | | |
| | (2.59)*** | | | |
| GLSS5 | 0.200 | | | |
| | (5.57)*** | | | |
| Constant | 14.514 | 14.351 | 15.098 | 14.703 |
| | (46.54)*** | (33.50)*** | (20.49)*** | (30.25)*** |
| Observations | 18728 | 4512 | 5985 | 8231 |
| R-squared | 0.68 | 0.57 | 0.69 | 0.78 |
| Number of clust | 1229 | 365 | 300 | 564 |

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Controls included for household assets and composition

**Table A5.17: Results of Hausman specification test without cluster means.**

| | GLSS 3 | | | | GLSS4 | | | | GLSS5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | fixed | random | Difference | S.E. | fixed | random | Difference | S.E. | fixed | random | Difference | S.E. |
| Years of schooling | -0.00533 | -0.00568 | 0.00035 | 0.00073 | -0.00321 | -0.00307 | -0.00014 | 0.00031 | -0.00657 | -0.00590 | -0.00067 | 0.00038 |
| Square of Years Sch. | 0.00190 | 0.00199 | -0.00009 | 0.00005 | 0.00193 | 0.00198 | -0.00004 | 0.00002 | 0.00254 | 0.00260 | -0.00006 | 0.00002 |
| Proportion girls 7-14 | -0.01247 | -0.00900 | -0.00347 | 0.00498 | -0.00209 | 0.01073 | -0.01282 | 0.00318 | 0.00719 | 0.01939 | -0.01220 | 0.00250 |
| Equivalent adults | -0.00487 | -0.00498 | 0.00011 | 0.00007 | -0.00381 | -0.00387 | 0.00006 | 0.00002 | -0.00347 | -0.00344 | -0.00003 | 0.00001 |
| Proportion boys 7-14 | -0.12421 | -0.12040 | -0.00381 | 0.00076 | -0.12135 | -0.12142 | 0.00006 | 0.00048 | -0.11444 | -0.11332 | -0.00113 | 0.00030 |
| Proportion over 59 | -0.00581 | -0.00596 | 0.00014 | 0.00007 | -0.00532 | -0.00534 | 0.00003 | 0.00002 | -0.00458 | -0.00461 | 0.00003 | 0.00001 |
| Proportion male adults | 0.00072 | 0.00060 | 0.00012 | 0.00006 | 0.00029 | 0.00026 | 0.00003 | 0.00002 | 0.00120 | 0.00120 | 0.00001 | 0.00001 |
| Proportion under 7 | -0.00133 | -0.00132 | -0.00001 | 0.00005 | -0.00166 | -0.00168 | 0.00002 | 0.00002 | -0.00024 | -0.00014 | -0.00009 | 0.00001 |
| Acres of land | -0.00560 | -0.00567 | 0.00007 | 0.00006 | -0.00491 | -0.00498 | 0.00007 | 0.00002 | -0.00438 | -0.00445 | 0.00006 | 0.00002 |
| Migrant | 0.00053 | 0.00066 | -0.00012 | 0.00040 | 0.00222 | 0.00230 | -0.00008 | 0.00006 | 0.00636 | 0.00658 | -0.00022 | 0.00026 |
| Total large animal | 0.00011 | 0.00011 | 0.00000 | 0.00000 | 0.00008 | 0.00008 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| Total small animal | 0.00069 | 0.00060 | 0.00008 | 0.00006 | 0.00238 | 0.00221 | 0.00017 | 0.00004 | 0.00003 | 0.00003 | 0.00000 | . |
| Age of head | -0.00146 | -0.00204 | 0.00058 | 0.00045 | 0.00141 | 0.00106 | 0.00035 | 0.00012 | 0.00086 | 0.00031 | 0.00055 | 0.00011 |
| Age squared | -0.00001 | 0.00000 | -0.00001 | 0.00000 | -0.00003 | -0.00003 | 0.00000 | 0.00000 | -0.00004 | -0.00003 | 0.00000 | 0.00000 |
| Sex of head | 0.01323 | 0.00392 | 0.00931 | 0.00409 | 0.01234 | 0.01179 | 0.00055 | 0.00169 | -0.09226 | -0.10287 | 0.01061 | 0.00131 |
| Chi 2 | 42.81 | | | | | | | 65.60 | | | | 149.46 |
| P value | 0.0002 | | | | | | | 0.0000 | | | | 0.0000 |

**Table A5.18: Results of Hausman specification test with cluster means.**

| | fixed | random | Difference | S.E. | fixed | random | Difference | S.E. | fixed | random | Difference | S.E. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Years of schooling | -0.00533 | -0.00573 | 0.00040 | 0.00052 | -0.00321 | -0.00322 | 0.00001 | 0.00030 | -0.00657 | -0.00631 | -0.00026 | 0.00027 |
| Square of Years Sch. | 0.00190 | 0.00192 | -0.00002 | 0.00004 | 0.00193 | 0.00194 | 0.00000 | 0.00002 | 0.00254 | 0.00253 | 0.00001 | 0.00002 |
| Proportion girls 7-14 | -0.01247 | -0.01693 | 0.00446 | 0.00264 | -0.00209 | 0.00244 | -0.00453 | 0.00131 | 0.00719 | 0.00993 | -0.00274 | 0.00135 |
| Equivalent adults | -0.00487 | -0.00485 | -0.00002 | 0.00003 | -0.00381 | -0.00381 | 0.00001 | . | -0.00347 | -0.00347 | 0.00000 | . |
| Proportion boys 7-14 | -0.12421 | -0.12425 | 0.00004 | 0.00037 | -0.12135 | -0.12165 | 0.00029 | 0.00016 | -0.11444 | -0.11460 | 0.00016 | 0.00015 |
| Proportion over 59 | -0.00581 | -0.00583 | 0.00002 | 0.00003 | -0.00532 | -0.00532 | 0.00000 | . | -0.00458 | -0.00457 | -0.00002 | . |
| Proportion male adults | 0.00072 | 0.00069 | 0.00003 | 0.00005 | 0.00029 | 0.00031 | -0.00002 | 0.00002 | 0.00120 | 0.00118 | 0.00002 | 0.00002 |
| Proportion under 7 | -0.00133 | -0.00127 | -0.00007 | 0.00005 | -0.00166 | -0.00167 | 0.00001 | 0.00002 | -0.00024 | -0.00018 | -0.00006 | 0.00002 |
| Acres of land | -0.00560 | -0.00554 | -0.00006 | 0.00004 | -0.00491 | -0.00492 | 0.00001 | 0.00001 | -0.00438 | -0.00438 | 0.00000 | 0.00001 |
| Migrant | 0.00053 | 0.00065 | -0.00012 | 0.00019 | 0.00222 | 0.00223 | 0.00000 | . | 0.00636 | 0.00646 | -0.00010 | . |
| Total large animal | 0.00011 | 0.00011 | 0.00000 | 0.00000 | 0.00008 | 0.00008 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 | 0.00000 |
| Total small animal | 0.00069 | 0.00068 | 0.00001 | 0.00002 | 0.00238 | 0.00238 | 0.00000 | . | 0.00003 | 0.00003 | 0.00000 | . |
| Age of head | -0.00146 | -0.00202 | 0.00056 | 0.00042 | 0.00141 | 0.00131 | 0.00010 | 0.00016 | 0.00086 | 0.00079 | 0.00007 | 0.00015 |
| Age squared | -0.00001 | 0.00000 | -0.00001 | 0.00000 | -0.00003 | -0.00003 | 0.00000 | 0.00000 | -0.00004 | -0.00004 | 0.00000 | 0.00000 |
| Sex of head | 0.01323 | 0.00967 | 0.00356 | 0.00408 | 0.01234 | 0.01355 | -0.00121 | 0.00196 | -0.09226 | -0.09772 | 0.00546 | 0.00162 |
| Chi 2 | 16.34 | | | | | | 29.26 | | | 15.15 | | |
| P value | 0.293 | | | | | | 0.0096 | | | 0.298 | | |

## Table A5.19: Household welfare: Random intercepts model

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Years of education (deviation | -0.007 | -0.005 | -0.003 | -0.007 |
| from mean) | (-2.99)*** | (-1.13) | (-0.81) | (-2.05)** |
| Square of school years (deviation | 0.002 | 0.002 | 0.002 | 0.003 |
| from mean) | (15.18)*** | (5.34)*** | (6.75)*** | (12.08)*** |
| Cluster mean (school years) | -0.012 | -0.032 | -0.022 | 0.034 |
| | (-0.74) | (-1.17) | (-0.59) | (1.45) |
| Cluster mean (school years | 0.005 | 0.005 | 0.005 | 0.003 |
| squared) | (4.71)*** | (2.23)** | (1.80)* | (2.02)** |
| Western | 0.547 | 0.387 | 0.475 | 0.556 |
| | (8.41)*** | (3.19)*** | (3.23)*** | (6.27)*** |
| Central | 0.589 | 0.587 | 0.219 | 0.648 |
| | (9.21)*** | (4.93)*** | (1.52) | (7.34)*** |
| Greater Accra | 0.538 | 0.492 | 0.481 | 0.405 |
| | (8.03)*** | (3.86)*** | (3.22)*** | (4.28)*** |
| Volta | 0.445 | 0.470 | -0.092 | 0.455 |
| | (6.87)*** | (4.05)*** | (-0.46) | (5.26)*** |
| Eastern | 0.505 | 0.438 | -0.033 | 0.530 |
| | (7.71)*** | (3.74)*** | (-0.16) | (6.10)*** |
| Ashanti | 0.607 | 0.567 | 0.457 | 0.561 |
| | (9.77)*** | (4.81)*** | (3.13)*** | (6.77)*** |
| Brong Ahafo | 0.444 | 0.363 | 0.349 | 0.359 |
| | (7.00)*** | (3.10)*** | (2.35)** | (4.13)*** |
| Northern | 0.266 | 0.237 | 0.152 | 0.287 |
| | (4.36)*** | (2.13)** | (1.09) | (3.74)*** |
| Upper West | -0.089 | 0.320 | -0.144 | -0.312 |
| | (-1.35) | (2.71)*** | (-0.92) | (-3.58)*** |
| Urban | 0.300 | 0.339 | 0.090 | 0.352 |
| | (10.96)*** | (7.84)*** | (1.92)* | (8.55)*** |
| proportion girls aged 7-14 | -0.004 | -0.005 | -0.004 | -0.003 |
| | (-14.16)*** | (-8.11)*** | (-8.36)*** | (-7.84)*** |
| equivalent adults | -0.116 | -0.124 | -0.122 | -0.115 |
| | (-49.01)*** | (-25.30)*** | (-28.47)*** | (-32.10)*** |
| proportion boys aged 7-14 | -0.005 | -0.006 | -0.005 | -0.005 |
| | (-18.76)*** | (-10.05)*** | (-11.47)*** | (-10.70)*** |
| proportion over 59 years | 0.001 | 0.001 | 0.000 | 0.001 |
| | (3.52)*** | (1.52) | (0.84) | (3.76)*** |
| proportion male adults | -0.001 | -0.001 | -0.002 | -0.000 |
| | (-5.35)*** | (-3.35)*** | (-5.57)*** | (-0.72) |
| proportion under 7 years | -0.005 | -0.006 | -0.005 | -0.004 |
| | (-22.44)*** | (-12.15)*** | (-12.87)*** | (-12.80)*** |
| migrant | -0.001 | -0.018 | 0.003 | 0.010 |
| | (-0.08) | (-0.91) | (0.15) | (0.70) |
| Male | -0.033 | 0.009 | 0.014 | -0.097 |
| | (-2.89)*** | (0.32) | (0.67) | (-5.87)*** |
| Migrant (mean) | -0.006 | 0.145 | 0.374 | 0.248 |
| | (-0.13) | (1.25) | (2.25)** | (2.23)** |
| GLSS4 | 0.074 | | | |
| | (2.50)** | | | |
| GLSS5 | 0.147 | | | |
| | (3.47)*** | | | |
| Constant | 14.084 | 13.880 | 15.791 | 15.053 |
| | (31.08)*** | (18.66)*** | (18.77)*** | (22.29)*** |
| Sigma u | 0.326 | 0.242 | 0.269 | 0.324 |
| | (43.33)*** | (20.27)*** | (21.42)*** | (29.35)*** |
| Sigma e | 0.460 | 0.465 | 0.454 | 0.454 |
| | (187.03)*** | (91.01)*** | (106.63)*** | (123.80)*** |
| Rho (ICC) | 0.414 | 0.339 | 0.372 | 0.418 |
| Observations | 18736 | 4515 | 5986 | 8235 |
| Number of clusters | 1229 | 365 | 300 | 564 |
| Log likelihood | -13331 | -3208 | -4074 | -5776 |

z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

## Table A5.20: Household welfare: random intercepts and contextual variables

| VARIABLES | Pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Years of education (deviation) | 0.001 | -0.005 | 0.003 | 0.003 |
| | (0.37) | (-0.92) | (0.72) | (0.76) |
| square of school years (deviation) | 0.001 | 0.002 | 0.001 | 0.002 |
| | (7.06)*** | (3.65)*** | (3.09)*** | (5.28)*** |
| Cluster mean (school years) | 0.013 | -0.026 | 0.025 | 0.061 |
| | (0.80) | (-0.96) | (0.65) | (2.61)*** |
| Cluster mean (school years squared) | 0.002 | 0.003 | 0.000 | -0.000 |
| | (1.72)* | (1.35) | (0.01) | (-0.24) |
| Western | 0.509 | 0.387 | 0.455 | 0.528 |
| | (7.91)*** | (3.26)*** | (3.17)*** | (5.98)*** |
| Central | 0.549 | 0.595 | 0.199 | 0.611 |
| | (8.68)*** | (5.11)*** | (1.42) | (6.94)*** |
| Greater Accra | 0.464 | 0.464 | 0.419 | 0.347 |
| | (6.92)*** | (3.73)*** | (2.87)*** | (3.63)*** |
| Volta | 0.438 | 0.508 | -0.081 | 0.441 |
| | (6.86)*** | (4.46)*** | (-0.41) | (5.15)*** |
| Eastern | 0.494 | 0.464 | -0.024 | 0.513 |
| | (7.65)*** | (4.05)*** | (-0.12) | (5.95)*** |
| Ashanti | 0.584 | 0.573 | 0.454 | 0.550 |
| | (9.52)*** | (4.97)*** | (3.20)*** | (6.68)*** |
| Brong Ahafo | 0.426 | 0.376 | 0.368 | 0.347 |
| | (6.82)*** | (3.29)*** | (2.55)** | (4.01)*** |
| Northern | 0.251 | 0.227 | 0.172 | 0.274 |
| | (4.18)*** | (2.09)** | (1.27) | (3.60)*** |
| Upper West | -0.109 | 0.327 | -0.122 | -0.340 |
| | (-1.68)* | (2.83)*** | (-0.80) | (-3.92)*** |
| Urban | 0.268 | 0.299 | 0.077 | 0.324 |
| | (9.68)*** | (6.92)*** | (1.68)* | (7.73)*** |
| proportion girls aged 7-14 | -0.004 | -0.005 | -0.004 | -0.003 |
| | (-14.21)*** | (-8.11)*** | (-8.38)*** | (-7.89)*** |
| equivalent adults | -0.117 | -0.124 | -0.122 | -0.115 |
| | (-49.15)*** | (-25.25)*** | (-28.57)*** | (-32.24)*** |
| proportion boys aged 7-14 | -0.005 | -0.006 | -0.005 | -0.005 |
| | (-18.84)*** | (-10.07)*** | (-11.51)*** | (-10.78)*** |
| Proportion in formal employment | 1.415 | 1.464 | 1.880 | 1.194 |
| | (6.07)*** | (4.03)*** | (3.89)*** | (3.71)*** |
| Interaction: years of schooling and | 0.000 | 0.003 | 0.002 | -0.001 |
| proportion in formal employment | (0.41) | (1.37) | (0.99) | (-0.68) |
| Interaction: years of schooling squared and | 0.0007 | -0.0002 | 0.0005 | 0.0008 |
| cluster mean of years of schooling sq. | (2.26)** | (-0.24) | (0.81) | (2.09)** |
| GLSS4 | 0.111 | | | |
| | (3.73)*** | | | |
| GLSS5 | 0.152 | | | |
| | (3.65)*** | | | |
| Sigma u | 0.320 | 0.235 | 0.261 | 0.321 |
| | (43.14)*** | (20.01)*** | (21.25)*** | (29.28)*** |
| Sigma e | 0.459 | 0.464 | 0.453 | 0.453 |
| | (187.03)*** | (91.02)*** | (106.63)*** | (123.79)*** |
| ICCC | 0.411 | 0.336 | 0.366 | 0.415 |
| Constant | 14.157 | 14.143 | 15.577 | 14.882 |
| | (31.71)*** | (19.49)*** | (18.85)*** | (22.11)*** |
| Observations | 18736 | 4515 | 5986 | 8235 |
| Number of clusters | 1229 | 365 | 300 | 564 |
| Log likelihood | -13374 | -3205 | -4079 | -5798 |

z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Controls included for age, household size, assets and composition

**Table A5.21: Household welfare: random coefficients for education**

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Years of education (deviation) | 0.001 | -0.006 | 0.003 | 0.003 |
| | (0.32) | (-0.95) | (0.60) | (0.76) |
| square of school years (deviation) | 0.0015 | 0.0019 | 0.0013 | 0.0015 |
| | (6.96)*** | (3.60)*** | (3.16)*** | (5.20)*** |
| Cluster mean of years of schooling | 0.013 | -0.026 | 0.023 | 0.060 |
| | (0.75) | (-0.96) | (0.59) | (2.53)** |
| Cluster mean of years of schooling sq | 0.002 | 0.003 | 0.000 | -0.000 |
| | (1.76)* | (1.35) | (0.09) | (-0.18) |
| Proportion in formal employment | 1.482 | 1.508 | 2.018 | 1.240 |
| | (6.29)*** | (4.13)*** | (4.13)*** | (3.81)*** |
| Interaction: years of schooling squared and cluster mean of years of schooling squared | 0.0007 | -0.0002 | 0.0005 | 0.0008 |
| | (2.26)** | (-0.24) | (-0.24) | (0.81) |
| GLSS4 | 0.111 | | | |
| | (3.74)*** | | | |
| GLSS5 | 0.156 | | | |
| | (3.75)*** | | | |
| Constant | 14.081 | 14.204 | 15.303 | 14.855 |
| | (31.64)*** | (19.45)*** | (18.80)*** | (22.27)*** |
| Standard deviation (random intercept) | 0.3206 | 0.2347 | 0.2611 | 0.3211 |
| (Standard error) | (0.0074) | (0.0117) | (0.0123) | (0.011) |
| Standard deviation (Years of education Squared (deviation)) | 0.00067 | 0.00070 | 0.00077 | 0.00062 |
| (Standard error) | (0.00011) | (0.00026) | (0.00017) | (0.00016) |
| Observations | 18728 | 4512 | 5985 | 8231 |
| Number of clusters | 1229 | 365 | 300 | 564 |
| Log likelihood | -13286 | -3196 | -4055 | -5750 |

z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

Controls included for age, household size, assets and composition and for contextual effects

## Table A5.22: Wages in employment and qualifications (OLS)

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Age in years | 0.067 | 0.057 | 0.091 | 0.056 |
| | (8.95)*** | (4.32)*** | (6.60)*** | (4.99)*** |
| Square of age | -0.001 | -0.000 | -0.001 | -0.001 |
| | (-7.40)*** | (-3.03)*** | (-5.60)*** | (-4.28)*** |
| Male | 0.143 | 0.080 | 0.187 | 0.148 |
| | (4.57)*** | (1.34) | (2.88)*** | (3.26)*** |
| Some education | -0.010 | 0.108 | 0.012 | -0.106 |
| | (-0.13) | (0.90) | (0.08) | (-0.83) |
| Primary | 0.124 | 0.271 | 0.159 | 0.019 |
| | (1.64) | (2.25)** | (0.95) | (0.17) |
| Middle school cert | 0.292 | 0.498 | 0.361 | 0.121 |
| | (5.23)*** | (5.98)*** | (2.92)*** | (1.41) |
| Vocational or commerce | 0.577 | 0.693 | 0.674 | 0.472 |
| | (6.06)*** | (4.38)*** | (3.53)*** | (3.26)*** |
| O Level | 0.617 | 0.839 | 0.540 | 0.584 |
| | (8.95)*** | (8.59)*** | (3.77)*** | (4.75)*** |
| SSS Cert | 0.506 | 0.000 | 0.900 | 0.305 |
| | (5.93)*** | (.) | (4.41)*** | (2.95)*** |
| A Level | 0.935 | 1.156 | 1.032 | 0.673 |
| | (11.09)*** | (8.05)*** | (6.92)*** | (4.21)*** |
| Teacher Training A | 1.227 | 0.635 | 1.053 | 1.244 |
| | (12.66)*** | (3.71)*** | (6.00)*** | (9.97)*** |
| Teacher Training B | 1.160 | 1.391 | 1.069 | 1.180 |
| | (14.59)*** | (8.87)*** | (7.91)*** | (9.03)*** |
| Technical/professional cert | 0.823 | 1.043 | 0.792 | 0.739 |
| | (11.29)*** | (7.10)*** | (5.35)*** | (7.11)*** |
| Technical/professional dip | 1.143 | 1.259 | 1.073 | 1.069 |
| | (12.32)*** | (5.95)*** | (5.30)*** | (8.88)*** |
| Bachelor degree | 1.549 | 1.331 | 1.750 | 1.496 |
| | (16.62)*** | (6.34)*** | (8.84)*** | (11.93)*** |
| Master's degree | 1.889 | 1.399 | 2.435 | 1.888 |
| | (11.87)*** | (4.70)*** | (11.73)*** | (9.39)*** |
| Doctorate | 2.331 | 1.527 | 0.000 | 2.749 |
| | (5.54)*** | (4.78)*** | (.) | (4.84)*** |
| Western | 0.406 | 0.387 | 0.425 | 0.548 |
| | (4.04)*** | (2.07)** | (3.20)*** | (2.43)** |
| Central | 0.350 | 0.328 | 0.259 | 0.579 |
| | (3.33)*** | (1.75)* | (1.91)* | (2.45)** |
| Greater Accra | 0.686 | 0.693 | 0.584 | 0.891 |
| | (7.35)*** | (3.85)*** | (5.86)*** | (4.00)*** |
| Volta | 0.339 | 0.460 | 0.339 | 0.352 |
| | (3.33)*** | (2.45)** | (2.97)*** | (1.49) |
| Eastern | 0.270 | 0.196 | 0.232 | 0.462 |
| | (2.66)*** | (0.94) | (2.05)** | (2.02)** |
| Ashanti | 0.453 | 0.450 | 0.509 | 0.560 |
| | (4.72)*** | (2.50)** | (4.82)*** | (2.48)** |
| Brong Ahafo | 0.327 | 0.465 | 0.315 | 0.410 |
| | (3.09)*** | (2.33)** | (1.80)* | (1.81)* |
| Northern | 0.439 | 0.547 | 0.236 | 0.655 |
| | (3.73)*** | (2.60)*** | (1.33) | (2.62)*** |
| Upper West | 0.355 | 0.270 | 0.490 | 0.249 |
| | (2.89)*** | (1.05) | (3.38)*** | (0.96) |
| Urban | -0.121 | -0.267 | 0.032 | -0.143 |
| | (-3.48)*** | (-4.44)*** | (0.49) | (-2.58)*** |
| GLSS4 | 3.357 | | | |
| | (88.89)*** | | | |
| GLSS5 | 6.311 | | | |
| | (183.96)*** | | | |
| Constant | 0.741 | 0.762 | 3.489 | 7.273 |
| | (4.35)*** | (2.44)** | (12.68)*** | (24.22)*** |
| Observations | 4772 | 1181 | 1349 | 2242 |
| Adjusted R-squared | 0.27 | 0.22 | 0.26 | 0.28 |

Robust t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1 Controls included for household size, assets and composition and for contextual effects/survey round.

**Table A5.24: Wages in employment**

| | Cluster Fixed Effects | | | | | | | | Household Fixed Effects | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Linear schooling term only | | | | Linear and quadratic schooling terms | | | | Linear schooling term only | | | |
| VARIABLES | (1) pooled | (2) GLSS 3 | (3) GLSS 4 | (4) GLSS 5 | (5) pooled | (6) GLSS 3 | (7) GLSS 4 | (8) GLSS 5 | (9) pooled | (10) GLSS 3 | (11) GLSS 4 | (12) GLSS 5 |
| Age in years | 0.066 | 0.060 | 0.084 | 0.059 | 0.069 | 0.061 | 0.087 | 0.065 | 0.032 | 0.067 | 0.042 | 0.015 |
| | (7.08)*** | (3.08)*** | (6.30)*** | (4.11)*** | (7.46)*** | (3.09)*** | (6.47)*** | (4.58)*** | (0.51) | (0.69) | (0.29) | (0.19) |
| Square of age | -0.001 | -0.000 | -0.001 | -0.001 | -0.001 | -0.000 | -0.001 | -0.001 | -0.000 | -0.000 | -0.000 | 0.000 |
| | (-5.49)*** | (-1.98)** | (-5.12)*** | (-3.31)*** | (-6.08)*** | (-2.02)** | (-5.40)*** | (-3.93)*** | (-0.16) | (-0.38) | (-0.13) | (0.04) |
| Male | 0.106 | 0.075 | 0.174 | 0.070 | 0.109 | 0.067 | 0.173 | 0.091 | 0.111 | -0.010 | 0.198 | 0.109 |
| | (2.67)*** | (1.17) | (2.29)** | (1.19) | (2.79)*** | (1.05) | (2.25)** | (1.62) | (0.71) | (-0.03) | (0.62) | (0.54) |
| schoolyears | 0.072 | 0.076 | 0.075 | 0.072 | -0.012 | 0.052 | -0.006 | -0.048 | 0.058 | 0.080 | 0.061 | 0.049 |
| | (16.30)*** | (10.54)*** | (8.61)*** | (10.91)*** | (-0.99) | (2.60)*** | (-0.25) | (-2.84)*** | (2.28)** | (1.32) | (1.15) | (1.55) |
| schoolyearssq | | | | | 0.005 | 0.001 | 0.005 | 0.006 | | | | |
| | | | | | (7.79)*** | (1.19) | (3.82)*** | (7.91)*** | | | | |
| Constant | 4.818 | 0.808 | 3.810 | 7.383 | 5.053 | 0.881 | 3.995 | 7.728 | 5.446 | 0.554 | 4.559 | 8.254 |
| | (26.08)*** | (2.05)** | (13.88)*** | (26.83)*** | (27.08)*** | (2.19)** | (14.54)*** | (28.15)*** | (4.51)*** | (0.30) | (1.65) | (5.26)*** |
| Observations | 4766 | 1180 | 1348 | 2238 | 4766 | 1180 | 1348 | 2238 | 4766 | 1180 | 1348 | 2238 |
| Number of clust | 969 | 275 | 248 | 446 | 969 | 275 | 248 | 446 | | | | |
| Adjusted R-squared | 0.17 | 0.18 | 0.19 | 0.15 | 0.19 | 0.18 | 0.21 | 0.19 | 0.23 | 0.37 | 0.25 | 0.18 |
| Number of uniquenh | | | | | | | | | 4232 | 1067 | 1215 | 1950 |

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

**Table A5.26: 'Returns' to household head's education in sources of household income (cluster fixed effects in the pooled sample)**

| VARIABLES | Wage employment | Agriculture | Non-farm self employment | Remittances | Rent | Other |
|---|---|---|---|---|---|---|
| Age in years | 0.063 | 0.057 | 0.039 | -0.024 | 0.015 | 0.022 |
| | (7.29)*** | (8.47)*** | (6.64)*** | (-5.68)*** | (4.94)*** | (0.86) |
| Square of age | -0.001 | -0.001 | -0.000 | 0.000 | -0.000 | -0.000 |
| | (-6.24)*** | (-7.82)*** | (-6.63)*** | (8.39)*** | (-3.26)*** | (-0.21) |
| Male | 0.312 | 0.556 | 0.195 | -0.489 | 0.124 | 0.250 |
| | (5.69)*** | (10.73)*** | (5.63)*** | (-14.17)*** | (5.53)*** | (1.48) |
| Years of education | -0.013 | 0.031 | 0.012 | -0.000 | -0.007 | 0.039 |
| | (-1.04) | (2.27)** | (1.15) | (-0.02) | (-0.86) | (0.93) |
| school years squared | 0.005 | -0.002 | 0.000 | 0.002 | 0.001 | 0.000 |
| | (7.16)*** | (-2.18)** | (0.52) | (2.60)*** | (1.86)* | (0.02) |
| Constant | 12.387 | 11.238 | 12.601 | 12.394 | 10.810 | 9.861 |
| | (65.59)*** | (65.13)*** | (90.60)*** | (114.19)*** | (128.00)*** | (15.84)*** |
| Observations | 4915 | 10604 | 8781 | 10861 | 8603 | 1631 |
| Number of clust | 1034 | 1072 | 1217 | 1227 | 1159 | 554 |
| Adjusted R-squared | 0.16 | 0.04 | 0.02 | 0.07 | 0.03 | 0.04 |

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls included for household size, assets and composition

## Table A5.27: Multinomial model for occupational selection (pooled sample)

| VARIABLES | Wage public | Wage Pri | Informal | Farm Export | Self-Emp |
|---|---|---|---|---|---|
| Age in years | 1.248 | 0.978 | 0.895 | 1.063 | 0.984 |
| | (11.64)*** | (-1.47) | (-8.33)*** | (4.84)*** | (-2.00)** |
| Square of age | 0.998 | 1.000 | 1.001 | 1.000 | 1.000 |
| | (-11.66)*** | (0.07) | (6.30)*** | (-2.48)** | (0.59) |
| Male | 0.875 | 1.438 | 1.231 | 1.754 | 0.434 |
| | (-1.62) | (3.88)*** | (2.36)** | (6.88)*** | (-17.77)*** |
| Some education | 1.084 | 1.288 | 1.352 | 1.321 | 1.372 |
| | (0.41) | (1.41) | (2.20)** | (2.50)** | (4.33)*** |
| Primary | 2.103 | 1.893 | 1.517 | 1.237 | 1.533 |
| | (4.61)*** | (4.00)*** | (3.18)*** | (1.87)* | (5.84)*** |
| Middle school cert | 6.433 | 3.873 | 1.746 | 1.313 | 1.874 |
| | (16.29)*** | (10.86)*** | (5.14)*** | (2.97)*** | (10.41)*** |
| Vocational | 20.308 | 8.610 | 1.805 | 0.464 | 3.069 |
| | (11.49)*** | (7.47)*** | (1.67)* | (-1.04) | (4.89)*** |
| O Level | 30.534 | 9.837 | 2.424 | 1.091 | 2.420 |
| | (19.34)*** | (11.39)*** | (3.89)*** | (0.28) | (5.68)*** |
| SSS Cert | 19.779 | 9.576 | 1.933 | 1.245 | 2.134 |
| | (10.37)*** | (8.85)*** | (2.39)** | (0.40) | (3.55)*** |
| A Level | 62.461 | 18.242 | 2.227 | 0.000 | 4.058 |
| | (10.92)*** | (7.26)*** | (1.58) | (-0.00) | (3.73)*** |
| Teacher Training B | 489.376 | 18.022 | 1.262 | 3.806 | 6.582 |
| | (18.58)*** | (5.95)*** | (0.22) | (2.69)*** | (5.23)*** |
| Technical/prof cert | 112.911 | 33.492 | 8.312 | 3.398 | 10.446 |
| | (16.10)*** | (11.09)*** | (6.09)*** | (2.84)*** | (8.40)*** |
| Technical/prof dip | 139.698 | 31.800 | 3.401 | 0.666 | 5.116 |
| | (12.98)*** | (8.41)*** | (2.30)** | (-0.38) | (4.16)*** |
| Bachelor degree | 198.153 | 29.257 | 1.136 | 0.000 | 3.326 |
| | (12.42)*** | (7.37)*** | (0.16) | (-0.00) | (2.58)*** |
| Master's degree | 278.373 | 26.750 | 0.000 | 0.000 | 5.880 |
| | (5.26)*** | (2.91)*** | (-0.00) | (-0.00) | (1.59) |
| Western | 2.007 | 7.886 | 6.928 | 652.690 | 5.541 |
| | (3.39)*** | (6.48)*** | (6.92)*** | (6.45)*** | (11.04)*** |
| Central | 0.899 | 4.118 | 3.554 | 224.677 | 3.902 |
| | (-0.50) | (4.36)*** | (4.42)*** | (5.39)*** | (8.89)*** |
| Greater Accra | 5.035 | 34.705 | 33.277 | 8.614 | 24.030 |
| | (7.34)*** | (10.91)*** | (12.18)*** | (1.52) | (18.26)*** |
| Volta | 0.818 | 2.251 | 2.311 | 57.217 | 4.178 |
| | (-0.96) | (2.44)** | (2.86)*** | (4.01)*** | (9.46)*** |
| Eastern | 1.086 | 2.421 | 2.713 | 147.018 | 4.272 |
| | (0.40) | (2.69)*** | (3.48)*** | (4.96)*** | (9.61)*** |
| Ashanti | 0.832 | 4.447 | 4.194 | 229.549 | 4.150 |
| | (-0.91) | (4.76)*** | (5.25)*** | (5.41)*** | (9.59)*** |
| Brong Ahafo | 0.604 | 1.478 | 1.303 | 138.125 | 1.698 |
| | (-2.36)** | (1.17) | (0.89) | (4.90)*** | (3.39)*** |
| Northern | 0.904 | 1.038 | 1.318 | 0.000 | 3.134 |
| | (-0.46) | (0.10) | (0.91) | (-0.00) | (7.40)*** |
| Upper East | 0.658 | 0.144 | 0.464 | 0.000 | 2.289 |
| | (-1.51) | (-2.50)** | (-1.74)* | (-0.00) | (4.80)*** |
| Urban | 6.893 | 8.110 | 6.806 | 0.607 | 6.944 |
| | (25.32)*** | (24.81)*** | (23.15)*** | (-4.46)*** | (39.47)*** |
| GLSS4 | 0.442 | 0.902 | 0.828 | 1.325 | 1.107 |
| | (-9.67)*** | (-0.98) | (-1.66)* | (3.12)*** | (1.83)* |
| GLSS5 | 0.293 | 1.285 | 1.793 | 1.282 | 0.866 |
| | (-14.49)*** | (2.61)*** | (6.03)*** | (2.82)*** | (-2.66)*** |
| Constant | 0.000 | 0.012 | 0.180 | 0.000 | 0.218 |
| | (-16.57)*** | (-9.53)*** | (-4.30)*** | (-9.21)*** | (-6.43)*** |
| Observations | 19188 | | | | |
| Preudo R Squared | 0.228 | | | | |

Relative risk ratios (rrr) reported. Base outcome is 'food farmer'. *, ** and *** denote the 10, 5 and 1 % significance levels respectively. Z values are robust to data clustering.

**Table A5.28: Binary logistic model for selection into wage employment (cluster fixed effects)**

| VARIABLES | Pooled | GLSS3 | GLSS4 | GLSS5 |
|---|---|---|---|---|
| Age in years | 1.316 | 1.353 | 1.322 | 1.299 |
| | (33.45)*** | (17.56)*** | (18.21)*** | (21.76)*** |
| Square of age | 0.997 | 0.997 | 0.997 | 0.997 |
| | (-30.77)*** | (-15.67)*** | (-16.62)*** | (-20.50)*** |
| Male | 3.981 | 4.138 | 4.087 | 3.869 |
| | (33.24)*** | (16.59)*** | (17.51)*** | (22.71)*** |
| Some education | 1.321 | 1.687 | 1.287 | 1.170 |
| | (3.25)*** | (3.28)*** | (1.50) | (1.22) |
| Primary | 1.296 | 1.734 | 1.251 | 1.093 |
| | (3.13)*** | (3.42)*** | (1.41) | (0.73) |
| Middle school cert | 2.419 | 3.684 | 2.287 | 1.949 |
| | (13.45)*** | (10.55)*** | (6.58)*** | (6.70)*** |
| Vocational or commerce | 4.851 | 10.070 | 4.191 | 3.787 |
| | (12.77)*** | (8.29)*** | (6.16)*** | (7.62)*** |
| O Level | 5.318 | 7.720 | 5.496 | 4.216 |
| | (17.14)*** | (11.51)*** | (9.89)*** | (8.54)*** |
| SSS Cert | 3.293 | | 1.798 | 2.787 |
| | (10.81)*** | | (2.07)** | (7.59)*** |
| A Level | 6.039 | 11.157 | 6.602 | 3.606 |
| | (11.69)*** | (7.82)*** | (7.82)*** | (4.66)*** |
| Teacher Training A | 29.020 | 35.263 | 47.971 | 24.908 |
| | (14.39)*** | (3.10)*** | (5.87)*** | (12.19)*** |
| Teacher Training B | 95.876 | 129.463 | 106.834 | 50.717 |
| | (25.04)*** | (12.14)*** | (17.91)*** | (11.39)*** |
| Technical/professional cert | 8.257 | 37.590 | 7.269 | 6.680 |
| | (16.76)*** | (7.19)*** | (8.90)*** | (11.23)*** |
| Technical/professional dip | 10.388 | 9.885 | 10.301 | 9.229 |
| | (14.36)*** | (5.03)*** | (8.13)*** | (9.98)*** |
| Bachelor degree | 22.669 | 10.758 | 21.516 | 24.427 |
| | (14.90)*** | (4.61)*** | (6.31)*** | (12.23)*** |
| Master's degree | 20.689 | 4.144 | 23.008 | 25.691 |
| | (7.86)*** | (1.51) | (3.37)*** | (6.87)*** |
| Observations | 36931 | 8567 | 12001 | 16363 |
| Number of clusters | 979 | 279 | 248 | 452 |
| Pseudo R Squared | 0.270 | 0.300 | 0.298 | 0.245 |

z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Controls included for household size, assets and composition

**Table A5.29: Household welfare and schooling by occupational group (pooled GLSS)**

| VARIABLES | Public sector formal | Private sector formal | Informal | Export farming | Food farming | Non-farm self-employment |
|---|---|---|---|---|---|---|
| Years of schooling | 0.040 | 0.035 | 0.029 | 0.017 | 0.015 | 0.028 |
| | (12.82)*** | (7.33)*** | (5.26)*** | (4.45)*** | (7.91)*** | (14.86)*** |
| Western | 0.529 | -0.126 | 0.227 | 1.566 | 0.596 | 0.609 |
| | (5.26)*** | (-0.66) | (0.86) | (12.54)*** | (16.82)*** | (11.43)*** |
| Central | 0.567 | -0.030 | 0.033 | 1.499 | 0.592 | 0.550 |
| | (5.27)*** | (-0.15) | (0.13) | (12.13)*** | (17.60)*** | (10.06)*** |
| Greater Accra | 0.612 | -0.102 | 0.008 | 1.811 | 0.745 | 0.685 |
| | (6.02)*** | (-0.53) | (0.03) | (16.95)*** | (11.19)*** | (13.20)*** |
| Volta | 0.366 | -0.179 | -0.060 | 1.423 | 0.502 | 0.512 |
| | (3.60)*** | (-0.91) | (-0.22) | (10.32)*** | (14.60)*** | (9.51)*** |
| Eastern | 0.460 | -0.085 | 0.091 | 1.354 | 0.589 | 0.527 |
| | (4.53)*** | (-0.43) | (0.34) | (10.87)*** | (17.17)*** | (10.03)*** |
| Ashanti | 0.687 | 0.052 | 0.231 | 1.482 | 0.600 | 0.777 |
| | (6.71)*** | (0.27) | (0.88) | (11.81)*** | (18.79)*** | (15.34)*** |
| Brong Ahafo | 0.433 | -0.152 | 0.013 | 1.566 | 0.472 | 0.574 |
| | (4.22)*** | (-0.76) | (0.05) | (11.97)*** | (14.68)*** | (10.23)*** |
| Northern | 0.372 | 0.004 | 0.089 | 0.000 | 0.221 | 0.403 |
| | (3.25)*** | (0.02) | (0.32) | (.) | (6.48)*** | (7.07)*** |
| Upper West | 0.379 | -0.469 | -0.338 | 0.000 | -0.034 | 0.083 |
| | (2.63)*** | (-1.57) | (-0.91) | (.) | (-0.92) | (0.83) |
| Urban | 0.334 | 0.235 | 0.326 | 0.218 | 0.281 | 0.295 |
| | (11.29)*** | (5.19)*** | (7.67)*** | (3.64)*** | (12.25)*** | (16.24)*** |
| GLSS4 | 0.187 | 0.251 | 0.129 | 0.297 | 0.098 | 0.144 |
| | (5.70)*** | (5.12)*** | (2.19)** | (6.51)*** | (5.15)*** | (6.87)*** |
| GLSS5 | 0.339 | 0.332 | 0.213 | 0.324 | 0.077 | 0.260 |
| | (8.82)*** | (7.15)*** | (4.12)*** | (7.14)*** | (4.20)*** | (12.16)*** |
| Constant | 14.054 | 14.426 | 14.123 | 12.306 | 13.723 | 13.972 |
| | (60.78)*** | (53.27)*** | (44.38)*** | (51.72)*** | (183.89)*** | (150.50)*** |
| Observations | 1653 | 1100 | 943 | 1203 | 7735 | 5222 |
| Adjusted R-squared | 0.53 | 0.42 | 0.38 | 0.37 | 0.40 | 0.45 |

Robust t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1
Controls included for household size, assets and composition

**Table A5.30: Household welfare and education by region (pooled sample)**

| VARIABLES | Western | Central | Greater Accra | Eastern | Volta | Ashanti | Brong Ahafo | Northern | Upper East | Upper West |
|---|---|---|---|---|---|---|---|---|---|---|
| Years of school | 0.024 | 0.023 | 0.037 | 0.013 | 0.018 | 0.035 | 0.026 | 0.022 | 0.021 | 0.011 |
| | (7.07)*** | (5.88)*** | (13.15)*** | (4.18)*** | (5.85)*** | (14.23)*** | (8.24)*** | (4.64)*** | (3.27)*** | (1.53) |
| Urban | 0.179 | 0.237 | 0.142 | 0.320 | 0.215 | 0.329 | 0.480 | 0.368 | 0.436 | 0.525 |
| | (5.48)*** | (6.88)*** | (3.42)*** | (10.28)*** | (7.34)*** | (12.91)*** | (14.69)*** | (8.86)*** | (6.39)*** | (5.66)*** |
| GLSS4 | 0.378 | -0.068 | 0.309 | 0.128 | 0.183 | 0.201 | 0.223 | -0.010 | -0.049 | -0.460 |
| | (11.92)*** | (-1.95)* | (10.70)*** | (2.83)*** | (4.20)*** | (7.26)*** | (6.85)*** | (-0.20) | (-0.67) | (-7.96)*** |
| GLSS5 | 0.452 | 0.219 | 0.299 | 0.196 | 0.369 | 0.203 | 0.107 | 0.014 | -0.016 | -0.831 |
| | (13.86)*** | (6.29)*** | (9.38)*** | (6.30)*** | (10.57)*** | (7.73)*** | (3.14)*** | (0.29) | (-0.27) | (-13.48)*** |
| public sector | 0.340 | 0.327 | 0.287 | 0.262 | 0.326 | 0.378 | 0.236 | 0.378 | 0.229 | 0.698 |
| | (7.59)*** | (5.38)*** | (3.75)*** | (5.99)*** | (6.99)*** | (9.08)*** | (5.07)*** | (4.54)*** | (2.11)** | (6.69)*** |
| private sector | 0.282 | 0.314 | 0.212 | 0.344 | 0.368 | 0.376 | 0.263 | 0.632 | 1.089 | 0.622 |
| | (5.48)*** | (4.38)*** | (2.80)*** | (5.03)*** | (5.18)*** | (8.94)*** | (3.58)*** | (4.68)*** | (4.86)*** | (3.59)*** |
| informal | 0.247 | 0.076 | -0.011 | 0.093 | 0.171 | 0.243 | 0.154 | 0.419 | 0.608 | 0.376 |
| | (3.50)*** | (1.26) | (-0.15) | (1.27) | (2.70)*** | (5.53)*** | (1.81)* | (4.58)*** | (2.51)** | (2.07)** |
| export farmer | 0.074 | 0.091 | 0.489 | 0.060 | -0.054 | 0.090 | 0.270 | 0.000 | 0.000 | -0.256 |
| | (1.97)** | (2.05)** | (5.16)*** | (0.89) | (-1.14) | (2.37)** | (5.54)*** | (.) | (.) | (-1.93)* |
| self-non-farm | 0.250 | 0.190 | 0.224 | 0.231 | 0.202 | 0.364 | 0.239 | 0.315 | 0.166 | 0.322 |
| | (6.97)*** | (5.19)*** | (3.20)*** | (6.98)*** | (6.51)*** | (12.69)*** | (6.24)*** | (7.06)*** | (2.85)*** | (3.63)*** |
| Constant | 14.154 | 14.285 | 14.273 | 14.306 | 14.058 | 14.382 | 13.998 | 14.027 | 13.829 | 14.309 |
| | (102.45)*** | (106.48)*** | (104.58)*** | (104.23)*** | (109.72)*** | (124.69)*** | (118.19)*** | (75.54)*** | (68.28)*** | (66.43)*** |
| Observations | 1945 | 1889 | 2394 | 2011 | 2101 | 3335 | 1783 | 1489 | 824 | 957 |
| Adjusted R-squared | 0.47 | 0.42 | 0.36 | 0.33 | 0.37 | 0.54 | 0.52 | 0.38 | 0.35 | 0.43 |

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls included for household size, assets and composition

**Table A5.31: Hours worked, education and occupation (household heads in the pooled sample)**

| VARIABLES | Co-efficient | t-statistic |
|---|---|---|
| Age in years | 59.009 | (10.00)*** |
| Square of age | -0.741 | (-10.61)*** |
| Sex of individual | 305.460 | (14.49)*** |
| Years of schooling | -9.329 | (-4.45)*** |
| Western | 392.805 | (7.41)*** |
| Central | 340.422 | (6.40)*** |
| Greater Accra | 579.382 | (11.01)*** |
| Volta | 467.843 | (8.92)*** |
| Eastern | 290.346 | (5.59)*** |
| Ashanti | 434.380 | (8.73)*** |
| Brong Ahafo | 557.641 | (10.58)*** |
| Northern | 110.900 | (2.09)** |
| Upper West | 76.576 | (1.31) |
| Public sector employee | 520.355 | (10.66)*** |
| Formal private sector employee | 771.873 | (14.82)*** |
| Informal private sector employee | 342.423 | (6.37)*** |
| Food farmer | 44.542 | (1.08) |
| Self-employed non-farm | 431.923 | (10.25)*** |
| GLSS4 | 3.884 | (0.16) |
| GLSS5 | 102.893 | (4.49)*** |
| Constant | -36.085 | (-0.27) |
| Observations | 15920 | |
| Adjusted R-squared | 0.09 | |

*** p<0.01, ** p<0.05, * p<0.1

**Table A5.32: Ever attendance at school: Probit model: Marginal effects at the mean (Ages 5-19)**

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Age in years | 0.064 | 0.108 | 0.058 | 0.041 |
| | (17.74)*** | (13.07)*** | (9.11)*** | (8.60)*** |
| Square of age | -0.002 | -0.004 | -0.002 | -0.002 |
| | (-16.71)*** | (-11.91)*** | (-8.64)*** | (-8.53)*** |
| Male | 0.033 | 0.086 | 0.034 | 0.010 |
| | (6.92)*** | (7.63)*** | (4.21)*** | (1.64) |
| Other relative of head | -0.076 | -0.086 | -0.065 | -0.088 |
| | (-6.43)*** | (-4.50)*** | (-3.05)*** | (-4.79)*** |
| Mother's education: Primary | 0.039 | 0.045 | 0.028 | 0.045 |
| | (5.19)*** | (3.04)*** | (2.35)** | (4.60)*** |
| Mother's education: Middle School/JSS | 0.064 | 0.104 | 0.068 | 0.037 |
| | (9.44)*** | (7.60)*** | (7.32)*** | (3.29)*** |
| Father's education: Primary | 0.061 | 0.065 | 0.055 | 0.055 |
| | (8.87)*** | (4.21)*** | (4.32)*** | (6.54)*** |
| Father's education: Middle School/JSS | 0.078 | 0.100 | 0.064 | 0.075 |
| | (11.21)*** | (7.50)*** | (4.91)*** | (8.20)*** |
| Father's education: O level | 0.083 | 0.108 | 0.087 | 0.056 |
| | (8.88)*** | (5.82)*** | (7.39)*** | (2.76)*** |
| Father's education : A level | 0.104 | 0.160 | 0.082 | 0.074 |
| | (9.10)*** | (13.96)*** | (3.02)*** | (3.17)*** |
| Father's education: Tertiary | 0.084 | 0.140 | 0.075 | 0.066 |
| | (7.22)*** | (8.28)*** | (3.26)*** | (4.83)*** |
| Father's education: Koranic | 0.103 | 0.156 | 0.091 | 0.085 |
| | (11.11)*** | (17.27)*** | (5.24)*** | (9.04)*** |
| HH Head in formal employment | 0.039 | 0.047 | 0.046 | 0.021 |
| | (4.53)*** | (3.06)*** | (3.24)*** | (1.44) |
| Log of household welfare | 0.034 | 0.079 | 0.017 | 0.040 |
| | (4.75)*** | (6.27)*** | (1.25) | (4.06)*** |
| GLSS4 | 0.030 | | | |
| | (2.88)*** | | | |
| GLSS5 | 0.071 | | | |
| | (7.59)*** | | | |
| Urban | 0.042 | 0.006 | 0.053 | 0.040 |
| | (4.34)*** | (0.25) | (3.63)*** | (2.96)*** |
| Western | 0.108 | 0.148 | 0.107 | 0.078 |
| | (10.82)*** | (5.29)*** | (5.86)*** | (6.75)*** |
| Central | 0.106 | 0.124 | 0.107 | 0.094 |
| | (11.26)*** | (3.42)*** | (6.73)*** | (10.90)*** |
| Greater Accra | 0.082 | 0.143 | 0.069 | 0.049 |
| | (5.87)*** | (4.33)*** | (2.50)** | (2.61)*** |
| Volta | 0.089 | 0.166 | 0.078 | 0.035 |
| | (6.75)*** | (5.91)*** | (3.22)*** | (1.60) |
| Eastern | 0.103 | 0.150 | 0.112 | 0.058 |
| | (9.16)*** | (5.19)*** | (6.41)*** | (3.85)*** |
| Ashanti | 0.109 | 0.178 | 0.082 | 0.079 |
| | (9.27)*** | (6.01)*** | (3.36)*** | (6.11)*** |
| Brong Ahafo | 0.112 | 0.180 | 0.095 | 0.073 |
| | (11.61)*** | (7.77)*** | (4.77)*** | (5.47)*** |
| Northern | -0.008 | 0.017 | 0.001 | -0.030 |
| | (-0.33) | (0.27) | (0.03) | (-1.12) |
| Upper West | 0.014 | -0.037 | 0.011 | 0.038 |
| | (0.62) | (-0.49) | (0.24) | (2.42)** |
| Observations | 32804 | 8324 | 10680 | 13664 |
| pseudo R-squared | 0.217 | 0.282 | 0.175 | 0.239 |

Robust z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1
Controls included for household factors.

**Table A5.33: Probit for current attendance at school: Marginal effects at the mean (ages 5-17)**

| VARIABLES | pooled | GLSS 3 | GLSS 4 | GLSS 5 |
|---|---|---|---|---|
| Age in years | 0.045 | 0.045 | 0.054 | 0.036 |
| | (13.41)*** | (6.66)*** | (9.00)*** | (8.11)*** |
| Square of age | -0.003 | -0.003 | -0.003 | -0.002 |
| | (-19.97)*** | (-10.28)*** | (-13.34)*** | (-11.91)*** |
| Male | 0.029 | 0.052 | 0.022 | 0.018 |
| | (7.17)*** | (6.10)*** | (2.74)*** | (3.87)*** |
| Other relative of head | -0.026 | -0.030 | -0.020 | -0.036 |
| | (-3.22)*** | (-1.73)* | (-1.49) | (-2.79)*** |
| Mother's education: Middle School/JSS | 0.020 | 0.031 | 0.020 | 0.013 |
| | (3.59)*** | (3.25)*** | (1.54) | (1.98)** |
| Mother's education: O level | 0.039 | 0.072 | 0.047 | 0.004 |
| | (3.22)*** | (5.14)*** | (1.84)* | (0.20) |
| Father's education: Middle School/JSS | 0.020 | 0.005 | 0.042 | 0.011 |
| | (3.65)*** | (0.48) | (3.82)*** | (1.63) |
| Father's education: O level | 0.027 | 0.011 | 0.051 | 0.006 |
| | (3.77)*** | (0.56) | (5.12)*** | (0.53) |
| Father's education: A level | 0.060 | 0.058 | 0.082 | 0.038 |
| | (8.82)*** | (3.14)*** | (9.76)*** | (3.98)*** |
| Father's education: Tertiary | 0.030 | 0.034 | 0.050 | 0.015 |
| | (2.48)** | (0.97) | (2.40)** | (1.07) |
| Head in formal employment | 0.016 | 0.013 | 0.031 | 0.007 |
| | (2.55)** | (0.80) | (2.83)*** | (0.88) |
| proportion under 7 years | -0.001 | -0.000 | -0.001 | -0.001 |
| | (-3.54)*** | (-1.30) | (-2.48)** | (-2.88)*** |
| sex - head | 0.018 | 0.007 | 0.041 | 0.009 |
| | (3.18)*** | (0.57) | (3.48)*** | (1.40) |
| Log of household welfare | 0.012 | 0.009 | 0.010 | 0.015 |
| | (2.63)*** | (0.96) | (1.10) | (2.72)*** |
| GLSS4 | -0.010 | | | |
| | (-1.33) | | | |
| GLSS5 | 0.039 | | | |
| | (6.08)*** | | | |
| Urban | -0.008 | -0.029 | 0.002 | -0.003 |
| | (-1.31) | (-1.93)* | (0.19) | (-0.38) |
| Western | -0.061 | -0.018 | -0.188 | -0.030 |
| | (-2.01)** | (-0.47) | (-2.91)*** | (-1.56) |
| Central | -0.071 | -0.004 | -0.258 | -0.027 |
| | (-2.13)** | (-0.12) | (-3.46)*** | (-1.19) |
| Greater Accra | -0.053 | 0.037 | -0.234 | -0.037 |
| | (-1.71)* | (1.44) | (-2.95)*** | (-1.78)* |
| Volta | -0.042 | -0.006 | -0.153 | -0.005 |
| | (-1.50) | (-0.18) | (-2.57)** | (-0.26) |
| Eastern | -0.070 | 0.013 | -0.268 | -0.028 |
| | (-2.25)** | (0.44) | (-3.92)*** | (-1.45) |
| Ashanti | -0.086 | -0.020 | -0.289 | -0.032 |
| | (-2.81)*** | (-0.59) | (-4.34)*** | (-1.92)* |
| Brong Ahafo | -0.044 | 0.008 | -0.186 | -0.006 |
| | (-1.56) | (0.24) | (-2.79)*** | (-0.39) |
| Northern | -0.011 | 0.067 | -0.150 | 0.000 |
| | (-0.43) | (3.63)*** | (-1.89)* | (0.01) |
| Upper West | -0.012 | 0.059 | -0.190 | 0.019 |
| | (-0.38) | (3.16)*** | (-1.80)* | (1.55) |
| Observations | 26636 | 6370 | 8980 | 11187 |
| pseudo R-squared | 0.316 | 0.287 | 0.330 | 0.332 |

Robust z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1
Controls included for household factors.
Marginal effects at the mean reported

**Table A5.34: Educational attainment outcomes: Multinomial logistic model (pooled GLSS Ages 19 to 35)**

| | Primary drop-out | | Primary completer | | Lower secondary completer | | Higher levels | |
|---|---|---|---|---|---|---|---|---|
| | rrr | z stat | rrr | z stat | rrr | z stat | rrr | z stat |
| Male | 1.279 | 2.65*** | 1.809 | 6.70*** | 2.684 | 12.68*** | 4.060 | 15.07*** |
| Spouse of head | 0.665 | -3.71*** | 0.647 | -4.17*** | 0.542 | -6.88*** | 0.381 | -7.33*** |
| Child of head | 1.550 | 2.85*** | 1.859 | 4.35*** | 2.309 | 6.43*** | 3.716 | 8.59*** |
| Grandchild of head | 1.613 | 1.37 | 2.065 | 2.24** | 2.568 | 2.79*** | 2.718 | 2.67*** |
| Servant | 0.691 | -0.42 | 0.255 | -2.39** | 0.271 | -2.44** | 0.043 | -3.60*** |
| Log of household size | 0.801 | -2.55** | 0.832 | -2.15** | 0.954 | -0.59 | 1.230 | 2.08** |
| % HH under 7 years | 1.003 | 1.19 | 1.000 | -0.06 | 0.994 | -3.36*** | 0.984 | -6.84*** |
| % HH over 59 years | 0.995 | -1.18 | 0.992 | -1.93* | 0.988 | -3.52*** | 0.998 | -0.51 |
| Formal public sector | 1.834 | 2.86*** | 2.312 | 5.84*** | 4.096 | 11.56*** | 20.412 | 20.24*** |
| Formal private sector | 1.317 | 1.29 | 1.983 | 3.75*** | 2.985 | 6.73*** | 6.655 | 10.01*** |
| Formal private sector | 1.269 | 1.41 | 1.556 | 2.53** | 1.533 | 2.77*** | 1.697 | 2.70*** |
| Export farmer | 1.410 | 2.28** | 1.547 | 2.93*** | 1.401 | 2.34** | 1.135 | 0.55 |
| Self-employed non-farm | 1.518 | 4.36*** | 1.891 | 6.11*** | 1.896 | 6.67*** | 2.490 | 7.27*** |
| Not working | 1.804 | 1.92* | 1.669 | 1.91* | 2.075 | 3.00*** | 4.527 | 5.31*** |
| Log household welfare | 1.174 | 2.31** | 1.335 | 4.01*** | 1.889 | 9.24*** | 4.053 | 14.68*** |
| GLSS4 | 1.429 | 2.97*** | 1.412 | 2.85*** | 1.288 | 2.01** | 1.898 | 4.03*** |
| GLSS5 | 1.553 | 4.37*** | 1.368 | 3.00*** | 1.008 | 0.08 | 1.816 | 4.72*** |
| Urban | 0.902 | -0.86 | 1.056 | 0.47 | 1.376 | 2.83*** | 1.871 | 4.44*** |
| Western | 4.463 | 6.84*** | 6.517 | 8.27*** | 8.147 | 9.15*** | 2.174 | 2.89*** |
| Central | 6.963 | 9.01*** | 7.550 | 8.37*** | 8.252 | 8.54*** | 1.788 | 2.04** |
| Greater Accra | 4.171 | 5.84*** | 6.403 | 7.42*** | 8.835 | 8.57*** | 3.238 | 4.21*** |
| Volta | 5.647 | 7.84*** | 7.702 | 8.21*** | 7.763 | 7.86*** | 2.229 | 2.63*** |
| Eastern | 5.158 | 7.41*** | 7.653 | 8.80*** | 9.540 | 9.72*** | 2.102 | 2.69*** |
| Ashanti | 7.331 | 9.20*** | 9.651 | 9.73*** | 13.008 | 10.65*** | 2.731 | 3.68*** |
| Brong Ahafo | 4.441 | 6.52*** | 7.652 | 8.36*** | 8.758 | 8.32*** | 1.938 | 2.42** |
| Northern | 0.749 | -1.19 | 0.919 | -0.32 | 0.561 | -2.35** | 0.557 | -1.71* |
| Upper East | 1.530 | 1.63 | 1.402 | 1.43 | 1.189 | 0.51 | 0.981 | -0.06 |
| Constant | 0.135 | -1.37 | 0.018 | -2.77*** | 0.000 | -7.26*** | 0.000 | -15.67*** |
| Observations | 18993 | | | | | | | |
| Pseudo R squared | 0.193 | | | | | | | |

Relative risk ratios (rrr) reported. Base outcome is 'never attended school'. *, ** and *** denote the 10, 5 and 1 % significance levels respectively. Z values are robust to data clustering. Controls included for child age and its quadratic and age/sex of the household head.

**Table A5.35: Logistic regression for schooling progression outcomes (odds ratios)**

| | GLSS 3 | | | | GLSS 4 | | | | GLSS 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VARIABLES | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Male | 1.734 | 1.815 | 1.660 | 2.295 | 1.439 | 1.722 | 1.490 | 3.050 | 1.662 | 1.100 | 1.346 | 1.570 |
| | (2.73)*** | (3.65)*** | (3.14)*** | (3.48)*** | (1.45) | (3.14)*** | (2.33)** | (4.15)*** | (3.43)*** | (0.78) | (1.91)* | (2.53)** |
| Other relative | 0.845 | 0.904 | 0.761 | 0.595 | 0.799 | 0.448 | 1.116 | 0.535 | 0.344 | 0.899 | 1.194 | 0.389 |
| | (-0.50) | (-0.40) | (-1.01) | (-0.76) | (-0.89) | (-2.78)*** | (0.35) | (-1.01) | (-4.87)*** | (-0.57) | (0.59) | (-2.05)** |
| Formal public | 1.008 | 0.999 | 2.473 | 10.977 | 1.284 | 1.803 | 2.623 | 7.757 | 1.201 | 1.572 | 1.310 | 8.420 |
| | (0.03) | (-0.00) | (3.09)*** | (5.84)*** | (0.54) | (1.61) | (2.71)*** | (5.93)*** | (0.36) | (1.41) | (0.90) | (7.40)*** |
| Formal private | 1.866 | 1.295 | 1.491 | 3.354 | 2.887 | 0.509 | 1.562 | 3.663 | 1.081 | 1.388 | 1.465 | 2.369 |
| | (0.94) | (0.63) | (1.11) | (2.43)** | (1.89)* | (-1.75)* | (1.45) | (3.57)*** | (0.22) | (1.20) | (1.64) | (3.32)*** |
| Log welfare | 1.542 | 0.986 | 1.898 | 1.781 | 0.963 | 1.166 | 1.067 | 2.420 | 1.447 | 1.306 | 1.478 | 2.137 |
| | (2.13)** | (-0.10) | (4.86)*** | (3.44)*** | (-0.20) | (0.95) | (0.50) | (4.65)*** | (2.97)*** | (2.43)** | (3.15)*** | (5.75)*** |
| father's school yrs | 1.122 | 1.034 | 1.030 | 1.041 | 1.067 | 1.054 | 1.030 | 1.110 | 1.108 | 1.034 | 1.037 | 1.061 |
| | (5.54)*** | (2.10)** | (2.17)** | (2.29)** | (3.04)*** | (3.09)*** | (2.14)** | (6.09)*** | (5.32)*** | (2.70)*** | (3.06)*** | (4.52)*** |
| Urban | 0.763 | 1.043 | 1.222 | 1.573 | 0.995 | 1.153 | 1.471 | 0.969 | 0.926 | 1.269 | 1.131 | 1.431 |
| | (-0.78) | (0.17) | (1.13) | (2.17)** | (-0.02) | (0.69) | (2.00)** | (-0.11) | (-0.34) | (1.59) | (0.76) | (1.89)* |
| Western | 6.469 | 1.485 | 0.938 | 0.307 | 1.985 | 2.802 | 1.469 | 0.332 | 1.258 | 1.169 | 1.014 | 0.171 |
| | (3.48)*** | (0.61) | (-0.08) | (-0.90) | (1.30) | (2.98)*** | (0.87) | (-2.70)*** | (0.61) | (0.59) | (0.04) | (-3.01)*** |
| Central | 6.026 | 0.881 | 0.882 | 0.304 | 3.228 | 1.331 | 0.936 | 0.338 | 1.922 | 1.521 | 1.143 | 0.072 |
| | (3.39)*** | (-0.19) | (-0.14) | (-0.92) | (2.37)** | (0.91) | (-0.15) | (-2.65)*** | (1.53) | (1.65)* | (0.38) | (-4.47)*** |
| Greater Accra | 7.239 | 1.138 | 1.293 | 0.684 | 1.934 | 3.303 | 0.904 | 0.302 | 1.215 | 1.278 | 1.426 | 0.205 |
| | (3.21)*** | (0.20) | (0.30) | (-0.29) | (1.05) | (2.84)*** | (-0.21) | (-2.88)*** | (0.50) | (0.79) | (1.07) | (-2.85)*** |
| Volta | 9.163 | 1.061 | 1.274 | 0.480 | 2.691 | 2.206 | 1.019 | 0.221 | 1.565 | 1.476 | 0.615 | 0.237 |
| | (4.18)*** | (0.09) | (0.28) | (-0.57) | (2.29)** | (2.71)*** | (0.04) | (-3.53)*** | (1.18) | (1.45) | (-1.38) | (-2.37)** |
| Eastern | 6.745 | 1.347 | 1.326 | 0.417 | 3.938 | 1.958 | 1.070 | 0.224 | 1.453 | 1.648 | 0.906 | 0.079 |
| | (3.32)*** | (0.45) | (0.32) | (-0.66) | (2.79)*** | (1.77)* | (0.16) | (-3.39)*** | (0.90) | (1.78)* | (-0.30) | (-4.44)*** |
| Ashanti | 12.365 | 1.178 | 1.359 | 0.318 | 4.860 | 1.471 | 1.178 | 0.219 | 1.998 | 1.489 | 1.224 | 0.107 |
| | (4.83)*** | (0.26) | (0.36) | (-0.89) | (3.42)*** | (1.17) | (0.38) | (-3.46)*** | (2.01)** | (1.60) | (0.61) | (-4.02)*** |
| Brong Ahafo | 18.149 | 1.185 | 0.829 | 0.296 | 4.885 | 2.938 | 1.836 | 0.332 | 1.353 | 1.590 | 1.040 | 0.167 |
| | (5.17)*** | (0.27) | (-0.22) | (-0.93) | (2.53)** | (2.90)*** | (1.22) | (-2.15)** | (0.81) | (1.78)* | (0.11) | (-3.19)*** |
| Northern | 2.231 | 0.865 | 0.464 | 1.214 | 0.569 | 1.926 | 0.478 | 2.180 | 0.402 | 0.967 | 0.423 | 1.056 |
| | (1.31) | (-0.19) | (-0.85) | (0.14) | (-1.33) | (1.11) | (-1.31) | (1.09) | (-2.95)*** | (-0.14) | (-2.31)** | (0.09) |
| Upper East | 1.884 | 0.746 | 1.617 | 0.437 | 1.327 | 1.528 | 3.669 | 2.151 | 0.632 | 1.212 | 0.487 | 1.877 |
| | (0.80) | (-0.31) | (0.51) | (-0.58) | (0.55) | (1.56) | (2.23)** | (1.99)** | (-1.67)* | (0.79) | (-1.94)* | (1.01) |
| Observations | 886 | 929 | 1271 | 994 | 839 | 1130 | 1474 | 1284 | 1792 | 2046 | 1953 | 1720 |
| PsR-squared | 0.200 | 0.0474 | 0.0831 | 0.234 | 0.207 | 0.0931 | 0.0552 | 0.255 | 0.226 | 0.0393 | 0.0811 | 0.242 |

Robust z-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1

**Table A8.9: Probit for ever attendance at school: Marginal effects at the mean**

| | Northern Region | Western Region | Central Region | Greater Accra Region | Volta Region | Eastern Region | Ashanti Region | Brong Ahafo Region | Upper East Region | Upper West Region |
|---|---|---|---|---|---|---|---|---|---|---|
| Age in years | 0.058 | 0.017 | 0.016 | 0.006 | 0.088 | 0.043 | 0.019 | 0.056 | 0.073 | 0.048 |
| | (2.02)** | (2.99)*** | (2.17)** | (1.37) | (4.63)*** | (2.80)*** | (2.67)*** | (4.98)*** | (2.73)*** | (1.57) |
| Square of age | -0.003 | -0.001 | -0.001 | -0.000 | -0.003 | -0.002 | -0.001 | -0.002 | -0.003 | -0.002 |
| | (-2.21)** | (-3.20)*** | (-2.22)** | (-1.30) | (-4.61)*** | (-2.50)** | (-3.02)*** | (-5.14)*** | (-2.60)*** | (-1.72)* |
| Male | 0.072 | 0.018 | 0.007 | 0.004 | 0.010 | -0.007 | 0.006 | 0.013 | -0.017 | -0.031 |
| | (2.38)** | (1.64) | (0.97) | (1.15) | (0.42) | (-0.37) | (0.66) | (0.85) | (-0.76) | (-1.11) |
| Grandchild of head | -0.025 | -0.045 | 0.002 | -0.004 | -0.126 | -0.013 | -0.002 | 0.051 | 0.105 | 0.025 |
| | (-0.24) | (-1.12) | (0.28) | (-0.38) | (-0.97) | (-0.31) | (-0.10) | (2.81)*** | (1.24) | (0.42) |
| Other relative of head | -0.186 | -0.053 | -0.094 | -0.010 | -0.001 | -0.041 | -0.201 | -0.072 | -0.183 | -0.048 |
| | (-3.21)*** | (-1.24) | (-1.43) | (-0.75) | (-0.02) | (-0.99) | (-3.05)*** | (-1.74)* | (-2.49)** | (-0.88) |
| Primary Ed Mother | 0.289 | 0.022 | 0.011 | 0.005 | 0.083 | 0.038 | 0.022 | 0.023 | 0.148 | -0.122 |
| | (3.51)*** | (2.36)** | (1.57) | (1.04) | (3.03)*** | (2.44)** | (2.45)** | (0.92) | (1.32) | (-0.59) |
| Primary Ed Father | 0.248 | 0.033 | 0.009 | 0.001 | 0.125 | -0.014 | 0.005 | 0.049 | 0.141 | 0.125 |
| | (3.21)*** | (3.09)*** | (1.49) | (0.29) | (4.25)*** | (-0.67) | (0.38) | (3.25)*** | (1.66)* | (1.73)* |
| Public sector emp. | 0.336 | -0.020 | -0.040 | 0.005 | - | -0.023 | -0.010 | 0.018 | 0.175 | 0.190 |
| | (4.34)*** | (-0.56) | (-0.83) | (1.03) | - | (-0.37) | (-0.38) | (0.41) | (1.15) | (1.97)** |
| Non-farm self-emp. | 0.180 | 0.021 | 0.005 | -0.006 | -0.062 | 0.059 | 0.035 | -0.040 | 0.095 | 0.027 |
| | (3.68)*** | (2.56)** | (0.66) | (-0.90) | (-1.45) | (3.29)*** | (2.91)*** | (-1.25) | (1.20) | (0.43) |
| Sex –head (female) | -0.173 | -0.001 | -0.004 | -0.005 | -0.069 | 0.016 | -0.016 | -0.028 | -0.124 | -0.158 |
| | (-2.15)** | (-0.05) | (-0.75) | (-1.26) | (-1.53) | (0.71) | (-1.44) | (-1.30) | (-1.60) | (-2.27)** |
| Household welfare (log) | 0.149 | 0.014 | 0.006 | 0.005 | 0.065 | -0.006 | -0.020 | 0.062 | 0.104 | 0.086 |
| | (3.46)*** | (1.29) | (0.90) | (1.16) | (1.01) | (-0.30) | (-1.89)* | (2.33)** | (2.27)** | (2.57)** |
| Urban | 0.076 | -0.013 | 0.017 | 0.034 | 0.007 | 0.063 | 0.030 | 0.009 | 0.230 | 0.082 |
| | (1.04) | (-0.79) | (1.74)* | (1.47) | (0.13) | (3.75)*** | (2.34)** | (0.26) | (3.65)*** | (1.69)* |
| Observations | 1602 | 1170 | 836 | 816 | 949 | 1182 | 2237 | 1147 | 1200 | 1289 |
| pseudo R-squared | 0.126 | 0.296 | 0.227 | 0.352 | 0.232 | 0.172 | 0.167 | 0.234 | 0.111 | 0.0869 |

Robust z-statistics in parentheses(community fixed effects). *** p<0.01, ** p<0.05, * p<0.1

**Table A8.13: Regression results: English test and pre-schooling (school-fixed effects)**

| | Outcome: English Test Score 2007/8 | Outcome: Years of Pre-Schooling |
|---|---|---|
| Sex | 5.852 | 0.038 |
| | (1.96)* | (0.44) |
| Age | 4.607 | -0.084 |
| | (2.46)** | (-6.54)*** |
| Years overage for grade | -4.657 | - |
| | (-2.19)** | - |
| Absence from school (log proportion) | -3.376 | - |
| | (-1.89)* | - |
| Fostered | -6.047 | -0.270 |
| | (-1.72)* | (-2.67)*** |
| Receives private tuition | 3.028 | - |
| | (1.68)* | - |
| Caregiver literacy score | 0.301 | 0.002 |
| | (2.74)*** | (0.70) |
| Constant | -22.826 | 3.076 |
| | (-1.27) | (16.96)*** |
| Observations | 258 | 800 |
| R-squared | 0.14 | 0.06 |
| Number of schools | 12 | 13 |

t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: estimated using CommSS data

## Appendix B: Technical Appendix to Methodology Chapter

### 1. Linear Regression (Ordinary Least Squares)

The effects of a vector of independent explanatory variables $X_i$on a continuous response variable $y_i$ assumed to be linearly related may be estimated using an 'ordinary least squares' (OLS) regression model which minimises the values of unexplained residuals $\epsilon_i$ for a linear combination of predictors. The model may be expressed:

*(1)* $y_i = X_i\beta + \epsilon_i$

Each regression co-efficient in the estimated model represents the (marginal) effect of a one unit change in an explanatory variable $x_i$ on the response $y_i$, holding all other explanatory variables constant. These are known as 'partial effects' because each effect is estimated conditionally (net of) the effects of the other parameters included in the model. Provided a structural model is correctly specified, these effects may be interpreted as the independent causal effects of the $X_i$ on $y_i$. Although the OLS model is linear in the parameters $\beta_i$ it is possible to model non-linear effects of variables so that $\beta_i$ may represent, for example, a co-efficient on $x_i^2$ as is common in wage equations with respect to age or experience. The error term $\epsilon_i$ may be taken to include measurement error, omitted variables and other 'disturbance' between the model and the empirical phenomenon in question.

Consistent estimation of the $\beta_i$ co-efficients requires that E ($\epsilon$) = 0 and that Cov ($X_i$,$\epsilon$) = 0. These assumptions ensure population orthagonality (Wooldridge 2002:52). The exogeneity condition Cov ($X_i$,$\epsilon$) = 0 is emphasised in economic applications where particular attention is given to causal interpretation and to the precise estimation of particular co-efficients, such as the effect of education on earnings. Endogeneity in OLS models may arise due to omitted variables including selection effects; due to measurement error and/or simultaneity bias (see Wooldridge 2002:51), giving rise to inconsistent estimation.

### 2. Probit/Logit Models

OLS is not usually appropriate where outcomes are binary or categorical. A transformation or link function is required to restrict outcomes to the zero to one range.

In the binary case, the outcome $y_i$ follows a Bernouilli distribution with a probability $p_i$ that $y_i = 1$ of and 1- $p_i$ that $y_i = 0$. In a generalised model, $p_i$ is considered to depend on a vector of explanatory variables $X_i$ and their co-efficients $\beta_i$. The conditional probability is:

(2) $$p_i \equiv Pr(y_i = 1|X_i) = F(X_i\beta)$$

Where $F(\cdot)$represents the functional form of $X_i\beta$ usually the (inverse) logit or probit function which are alternative functions for modelling the distribution of $p_i$. The logit model specifies the conditional probability in terms of the cumulative density function (CDF) of the logistic distribution and the probit model in terms of the CDF of the standard normal distribution. Thus, the conditional probability Pr(y=1 $|X_i$) is given by:

(3) $$Pr(y_i = 1 \mid X_i) = \frac{e^{X_i\beta}}{1+e^{X_i\beta}}$$

in the case of the logit and $\Phi(X_i\beta)$ in the case of the probit. The logit approach thus models the log-odds of the outcome $y_i = 1$ and the exponentiated co-efficients are odds-ratios. Since the model is non-linear, marginal and conditional effects of explanatory variables are not constant or equivalent in logit and probit models.

These models may be extended to the case of an ordered polytomous outcome such as highest educational qualification. Where $y_{ij}$ is the ordered categorical outcome, and j takes a value from 1 to m where m is the number of categories, the probability that the outcome for individual i is category alternative j conditional on the explanatory variables may be written generically as

(4) $$Pr(y_i = j) = F\left(X_i, \mu_j\right)$$

The outcomes are modelled as a series of j-1 underlying binary models. The assumption is that there is a latent continuous response variable $y_i^*$ which is linear in $\beta_i$ and estimated at a series of thresholds or cut-points $\mu_j$ . The model assumes that data are case-specific and that outcomes cannot be predicted perfectly from the explanatory variables. The probabilities Pr ($y_i$ = j) sum to unity across all the possible outcomes since the categories must be mutually exclusive and defined for all observations. The ordered probit model defines the conditional probability as

(5) $$Pr(y_i = j) = \Phi\left(\mu_j - X_i\beta\right) - \Phi\left(\mu_{j-1} - X_i\beta\right)$$

while the ordered logit defines it as

(6)

$$Pr(y_i = j) = \frac{exp(\mu_j - X_i\beta)}{1 + exp(\mu_j - X_i\beta)}$$

For interpretation, one category is used as a reference and co-efficients are interpreted with respect to that base category. Exponentiated co-efficients in the logistic model are 'relative risk ratios'.

### 3. Fixed (Within), Between and Random Effects Models

'Fixed effects' or 'within effects' approaches model the effects of explanatory variables on the outcome $y_{ij}$ within groups by removing group-specific effects $\alpha_j$. The linear 'fixed effects' model may be expressed:

(7) $y_{ij} = \beta_0 + X_{ij}\beta + \alpha_j + \varepsilon_{ij}$

where $y_{ij}$ denotes the outcome for individual i in group j, $\beta_0$ a constant, $X_{ij}$ a vector of explanatory variables, $\beta$ their co-efficients, $\varepsilon_{ij}$ the individual error term for individual i in group j and $\alpha_j$ the 'fixed effect' for group j. Since the effect is to remove the effect of $\alpha_j$ (common to all i in cluster j and equivalent to the mean value of the outcome by group) the model may be expressed:

(8) $y_{ij} - \bar{y}_j = (X_{ij} - \bar{X}_j)\beta + (\varepsilon_{ij} - \bar{\varepsilon}_j)$

Covariates which do not vary within groups are dropped because their mean-centred values are zero. The 'between group' effects which are removed in the 'fixed effects' approach may be expressed in the estimator:

(9) $\bar{y}_j = \beta_0 + \bar{X}_i\beta + \bar{\varepsilon}_j$

A 'random effects' approach combines both the within and between estimators, estimating a weighted average of the within and between effects (Rabe-Hesketh and Skrondal 2008: 113). The approach relaxes the assumption that individual residuals are uncorrelated by introducing a group-level residual term. Thus,

(10) $y_{ij} = \beta_0 + X_{ij}\beta + u_j + \epsilon_{ij}$

where $u_j$ denotes the group-level residual or random deviation between the mean of $y_{ij}$ for group j and the overall mean and where $e_{ij}$ denotes the individual-level residual or random deviation between the mean of $y_{ij}$ for group j and the ith observation of $y_{ij}$.

The model assumes both error terms are normally distributed and that the group-level residual is uncorrelated with $x_{ij}$ so that

(11) $\boldsymbol{E(u_i|X_{ij}) = 0}$ and $\boldsymbol{E(\epsilon_{ij}|X_{ij}, u_j) = 0}$.

**4. Hausman Endogeneity Test**

The exogeneity assumption in random effects and multi-level models requires that group level random intercepts ($\boldsymbol{u_j}$) be uncorrelated with explanatory variables ($X_{ij}$ β). Estimates of co-efficients may be inconsistent if this assumption is violated. The Hausman (1978) specification test allows comparison of random effects estimators with fixed effects in order to explore systematic divergence indicative of endogeneity bias in the random effects approach. In a simple formulation of a model with only one covariate which varies between and within groups, the test statistic may be defined:

(12)

$$\boldsymbol{h = \frac{(\hat{\beta}^W - \hat{\beta}^R)^2}{\widehat{SE}(\hat{\beta}^W)^2 - \widehat{SE}(\hat{\beta}^R)^2}}$$

The statistic has a $\boldsymbol{\chi^2}$ distribution with in this case one degree of freedom. A significant value for the statistic may be interpreted as indicating the presence of possible endogeneity bias in the random effects approach (see Rabe-Hesketh and Skrondal 2008: 122).

**5. Multi-Level Models**

Multi-level modelling develops the linear 'random effects' approach to grouping discussed above to model the distribution of the $u_j$ or 'random intercept' term explicitly. The effects of covariates at group level are allowed to vary in order to model within and between group effects of explanatory variables. It is assumed that covariates are uncorrelated with random intercepts and random co-efficients and that these random effects are normally distributed.

Thus in a model with two grouping levels,

(13) $\boldsymbol{y_{ij} = \beta_0 + X_{ij}\beta + u_j + \gamma_j X_{ij} + \epsilon_{ij}}$

Where $\boldsymbol{\gamma_j X_{ij}}$ is a group-specific vector of random co-efficients (or random slopes) of $x_{ij}$

## 6. Quantile Regression

Most regression approaches model the distribution of the conditional mean (or expectation) of the outcome variable $y_i$ given a set of explanatory variables. Interest may also lie in the conditional distribution of a response at other points along its distribution including the median (50th percentile) or 10th and 90th percentiles. Quantile regression permits this by modelling the conditional expectation by quintile so that in place of $E(y|X) = X_i\beta$, $Q(y|X) = X_i\beta$. In the case of a least squares approach, instead of minimising $\sum_i^n[y_i - (X_i\beta)^2]$ the approach is to minimise $\sum_i^n f(y_i - (X_i\beta))$ where

$$(20) \quad f(y-q) = \begin{cases} \lambda(y-q), & y \geq q \\ (1-\lambda)(q-y), & y < q \end{cases}$$

and q represents the qth quintile and λ represents the conditional mean.

## Appendix C: Summary Results of Interviews with *Kayaye* Workers

### Table A8.14 Background Characteristics of Interviewees

| Interviewee | Gender | Age | District of Origin | Location Type | Highest Grade Completed | Time in Accra (years) | Current schooling | Age of drop-out |
|---|---|---|---|---|---|---|---|---|
| 1 | Male | 21 | Savelugu/Nanton | Urban | Primary 6 | 0.5 | None | 15 |
| 2 | Female | 20 | Tolon/Kumbungu | Rural | None | 0.5 | None | - |
| 3 | Female | 20 | Tolon/Kumbungu | Rural | None | 0.5 | None | - |
| 4 | Female | 17 | Tolon/Kumbungu | Rural | None | 0.7 | None | - |
| 5 | Female | 19 | Savelugu/Nanton | Rural | K'garten | 1 | None | 5 |
| 6 | Female | 20 | Savelugu/Nanton | Urban | Primary 4 | 7 | night school | 12 |
| 7 | Male | 20 | Savelugu/Nanton | Urban | JHS 1 | 4 | None | 16 |
| 8 | Female | 20 | Tolon/Kumbungu | Rural | Primary 1 | 2 | None | 15 |
| 9 | Female | 18 | Savelugu/Nanton | Rural | Primary 1 | 3.5 | None | 14 |
| 10 | Female | 17 | Savelugu/Nanton | Rural | JHS 1 | 3 | None | 15 |
| 11 | Female | 16 | Tolon/Kumbungu | Rural | Primary 1 | 0.5 | None | 15 |
| 12 | Female | 17 | Savelugu/Nanton | Rural | JHS 1 | 2 | None | 15 |

**Table A8.15: Family Situations of Interviewees**

| Interv-iewee | Family situation | Number of Siblings | Current work | Daily Earnings GH c | Work done in home village or town |
|---|---|---|---|---|---|
| 1 | Fostered by grandfather | 4 | Scrap dealer | 5 | Was schooling and helping grandfather on the farm |
| 2 | Lived with senior sister | 4 | *Kayaye* | 6 | Assisting in farm work |
| 3 | Lived with biological parents | 2 | *Kayaye* | 5 | Farming activities |
| 4 | Lived with foster-aunt | | *Kayaye* | 2 | Farming and domestic chores |
| 5 | Lived with mother after foster auntie's death | 3 | Assists in the sale of 'Tom-Brown' | 3 | The making of groundnut cake (Kulikuli) |
| 6 | Lives with auntie (fostered) at home | 2 | Assist in the sale of onions | 5 | Domestic chores |
| 7 | Living with sister after father's death | 5 | Scrap dealer | 5 | Helping my sister selling her sandals. Cleaning of the compound and fetching of water. Going for firewood |
| 8 | Lived with biological parents | 9 | *Kayaye* | 5 | Helping in cooking, sweeping, fetching of water etc. Household chores |
| 9 | Lived with aunt | 12 | *Kayaye* | 3 | Selling of ingredients. The normal household chores e.g. cooking, washing of bowls, fetching water etc. |
| 10 | Lived with grandmother | 4 | *Kayaye* | 4 | Farm work, the normal household chores, fetching of water, cooking etc. |
| 11 | Lived with aunt | 7 | *Kayaye* | 3 | Helping aunt to sell ingredients, normal household chores e.g. cooking, fetching of water, firewood etc. |
| 12 | Lived with biological parents | 6 | *Kayaye* | 3 | Helping on the farm, rice processing and the normal household chores e.g. cooking, fetching water, going for firewood etc |

## Table A8.16: Experiences of School

| Inter-viewee | Did you enjoy schoo l? | Was your attendance good? | Was your work satisfactory? | Were there any problems with schooling? | Who helped you with the costs? | Did you want to go further than you did? |
|---|---|---|---|---|---|---|
| 1 | Yes | Good except when asked to go to the farm | Satifactory, was able to answer questions and pass exams | Lack of money for slippers, school materials | Mother sometimes if grandfather unable, father did not. | Yes, still hopes to continue if he finds help |
| 5 | Yes | Good | Thought she was doing well | None except for dropping out of school due to her auntie's wish | Biological parents helped until she went to foster auntie but help stopped then. | Yes, will continue if she has the opportunit y |
| 6 | Yes | Good except when she had domestic work to do | Thought she was doing well | Lack of money for fees and school uniform | Foster auntie helped, none from biological parents | Yes |
| 7 | Yes | Not so good owing to finances | Was doing well in primary but did not enjoy JSS, where she had no financial help | Lack of money to buy books, pens and uniform | Sister helped until her bankruptcy | Yes |
| 8 | Yes | Good | Thought she was doing satisfactorily | No-one to buy books, pens and other learning materials | Father initially but inadequate help due to his old age | Yes |
| 9 | Yes | Good except when forced by parents to leave school and help on the farm | Thought she was doing well- was among those doing very well in school | Lack of money for contributions to schooling | Auntie helped and she raised some money herself through selling. Father dead. Mother helped only the children she lived with. | Yes |
| 10 | Yes | Good | Thought she was doing satisfactorily as she could read and write | Lack of money for school books and other things | Foster parent helped as did biological parents | Yes |
| 11 | Yes | Good | Thought she was doing satisfactorily | None | Biological parents helped if auntie was unable to | Yes |
| 12 | Yes | Good until father's death | Thought she was doing satisfactorily – was able to understand teaching and to do her work | Lack of money | | Yes |

## Table A8.17: Reasons for stopping schooling

| Interviewee | Reasons for Stopping Schooling |
|---|---|
| 1 | Grandfather to whom he was fostered died. Mother had no means to look after him. Mother was unable to provide essential items for schooling. For example, sometimes he had to attend school without slippers, for which he had been whipped. |
| 5 | Was taken to live with foster-aunt who compelled her to drop-out of school |
| 6 | Lack of money including for school-fees and school uniform |
| 7 | Lack of money including for books, pens, uniform. Sister went bankrupt. |
| 8 | Lack of money for learning materials. Father unable to help due to old age. |
| 9 | Lack of money for schooling. Auntie could not help as she had no money. |
| 10 | Lack of money. |
| 11 | Lack of money. Biological parents unable to continue to help foster-auntie with schooling costs. |
| 12 | Death of father and subsequently lack of money for schooling. |

## Table A8.18: Reasons for Going to *Kayaye*

| Interviewee | Reasons for going to *kayaye* | Encouragement or assistance from? |
|---|---|---|
| 1 | Grandfather to whom he was fostered died. Mother had no means to look after him. Saw that people had 'made it' in Accra and hoped to achieve the same. | Mother |
| 2 | No work in the house. Wanted to acquire some belongings including dresses. | Uncle |
| 3 | To acquire the means to buy a sewing-machine to provide a trade/livelihood. Thought she could find work in Accra. | No-one |
| 4 | To buy dresses and other belongings to prepare her for marriage. | No-one |
| 5 | To get the belongings she needs to get married. Had previously lived with sister in Accra, so knew the place. | Biological parents |
| 6 | To acquire things like clothes, bags. Thought Accra would be a place she could find work. | Auntie |
| 7 | Sister became bankrupt and had no money to buy goods. No help from anywhere else so had to leave. Knew people in Accra who could give her initial help. | No-one |
| 8 | Lack of money for learning materials. Father unable to help due to old age. Knew people in Accra who could give her initial help. | Father and brothers; wanted to go herself |
| 9 | To look for money to buy a sewing machine. Accra is the place all her friends came to. | No-one |
| 10 | To find money as family had none. Thought Accra is a place she could find a job. | No-one |
| 11 | To look for money. No way of finding money in the hometown but there are jobs she can do in Accra. | Friends and relatives |
| 12 | To look for money on mother's encouragement after father's death. Knew she could find work in Accra. | Friends and family, did not want to go herself |

**Table A8.19: Experience of *Kayaye***

| Inter-viewee | Experience |
|---|---|
| 1 | Better living conditions than in the North. Thought he would be able to make money more quickly and go home. Work is going on well. |
| 2 | Living conditions ok, but money not forthcoming. Unfortunate fire incident upset her plans. Work is progressing steadily. |
| 3 | Adequate money. Conditions ok. Some days she will make it, others she won't |
| 4 | Conditions and money adequate. Conditions were better at home in the North. Just roaming about looking for loads to carry |
| 5 | Variable depending on sales. Living conditions ok. |
| 6 | Living conditions ok and better than in the North. Work is going down. Sometimes she gets nothing. |
| 7 | Conditions difficult, sometimes no money. Expected better. |
| 8 | Accommodation is ok but lack of money. Expected to earn money more quickly and to return home with a sewing machine. |
| 9 | Conditions very difficult. Lack of money and living is costly. Thought she would come for a short time and earn the money for a sewing machine but has found it is not possible. |
| 10 | Conditions very difficult. Living is costly including paying for bath water etc. |
| 11 | Is obtaining money in the way she expected. |
| 12 | Living conditions ok. Only earns a little money. |

**Table A8.20: Intentions and Aspirations**

| Do you intend to return home? | What do you intend to do first? | Are you hoping to find money for schooling? | What education would you like to receive? | Aspirations |
|---|---|---|---|---|
| Yes | Acquire capital to start a business to help fend for younger siblings | | More education or training, whatever comes | Capital |
| Yes | Will return once belongings acquired | | | seamstress |
| Yes | Hopes to return at harvest and hopefully with sewing machine | | | Seamstress |
| Yes | Hopes to return at harvest with marriage items | | | Seamstress |
| Yes | Once marriage items acquired will return, marriage main reason to come to Accra | | To learn a trade – schooling is not the only thing that brings money, would appreciate training | Learn a skill |
| Yes | Only once items acquired will she return –all the things she needs; she intends to prepare for marriage | Yes | More education to learn skills | Selling if can get capital or hairdresser/seamstress |
| Yes | When she has enough money she will return; intends to prepare for marriage | Yes | More education or if she can get capital would like to get training | - |
| Yes | For the harvest, to help with the harvesting of ground-nuts | | To learn tailoring or to be a seamstress | Seamstress |
| Yes | Hopefully after Christmas but does not have the money to return home. Needs to acquire money | | More education, but not to go to school but to learn to be a seamstress | Seamstress / hairdresser / selling if can get capital |
| Yes | If she gets money she will return but intends to stay another year | | Yes, more education | Seamstress |
| Yes | Intends to return in the month of the Fire Festival | Yes | Yes, more education | More education |
| Yes | Intends to return after 4-5 months if she finds money; education main reason to be in Accra | Yes | Yes, more education | Commercial farming |

## Appendix D: Reference Tables

### Appendix D1: Recommended Energy Intakes (Ghana)

**Table A6.2: Recommended energy intakes**

| Category | Age (years) | Average energy allowance per day (kcal) | Equivalence scale |
|---|---|---|---|
| Infants | 0 - 0.5 | 650 | 0.22 |
| | 0.5 - 1.0 | 850 | 0.29 |
| Children | 1 – 3 | 1300 | 0.45 |
| | 4 – 6 | 1800 | 0.62 |
| | 7 – 10 | 2000 | 0.69 |
| Males | 11 – 14 | 2500 | 0.86 |
| | 15 – 18 | 3000 | 1.03 |
| | 19 – 25 | 2900 | 1.00 |
| | 25 - 50 | 2900 | 1.00 |
| | 51+ | 2300 | 0.79 |
| Females | 11 - 14 | 2200 | 0.76 |
| | 15 - 18 | 2200 | 0.76 |
| | 19 - 25 | 2200 | 0.76 |
| | 25 - 50 | 2200 | 0.76 |
| | 51+ | 1900 | 0.66 |

*Source:* Recommended Dietary Allowances, 10th edition, (Washington D.C.: National Academy Press, 1989).

## Appendix D2: Estimation of Total Household Consumption Expenditure from the GLSS 3 and 4 Surveys

**Table A6.1: Estimation of total household consumption expenditure from the GLSS 3 and GLSS 4 surveys**

| Element of total household consumption | Composition | Source of data in GLSS questionnaire | Notes |
|---|---|---|---|
| Expenditure on food, beverages and tobacco | Expenditure on about 120 commodities (based on pattern in several short recall periods in the past month) | Section 9B | |
| Consumption of own produced food | Consumption of food commodities from own production, valued by respondents at prices at which they could be sold | Section 8H | |
| | Wage income received in form of food (based on payment interval reported by respondents) | Section 4 | |
| Expenditure on non-food items | Expenditure on frequently purchased non-food items (based on pattern in several short recall periods in the past month) | Section 9A2 | Section 9B in GLSS5 |
| | Expenditure on less-frequently purchased non-food goods and services (based on pattern over last 3 or last 12 months) | Section 9A1 | Excluding purchases of durable goods and expenditure on hospital stays |
| | Expenditure on education (based on pattern for each child in past 12 months) | Section 2 | |
| | Expenditure on household utilities: water, electricity, garbage disposal (based on payment interval reported by respondents) | Section 7 | |
| Expenditure on housing | Actual rental expenditure (based on payment interval reported by respondents) | Section 7 | |
| | Imputed rent of owner occupied dwellings | Section 7 | Estimated based on hedonic regression equation |
| | Wage income received as subsidized housing (based on payment interval reported by respondents) | Section 4 | |
| Imputed expenditure on non-food items | Durable goods user values | Section 12B | |
| | Consumption from output of non-farm enterprises (based on two week period) | Section 10D | |
| | Wage income in kind in forms other than food and housing (based on payment interval reported by respondents) | Section 4 | |

Source: GSS (2007a)

## Appendix D3: EMIS District Enrolment Data for Savelugu-Nanton 2008/9

### District Level Enrolment Data — Savulugu Nanton District, NORTHERN Region

#### Enrolment Data - 2008/2009

**Public**

| | Creche/Nursery | Kindergarten | | | Primary | | | | | | | JHS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | KG1 | KG2 | TOTAL | P1 | P2 | P3 | P4 | P5 | P6 | TOTAL | JH1 | JH2 | JH3 | TOTAL |
| Boys | 0 | 2166 | 1470 | 3,636 | 1,908 | 1,630 | 1,542 | 1,513 | 1,373 | 1,260 | 9,226 | 1,015 | 1,033 | 721 | 2,769 |
| Girls | 0 | 1781 | 1284 | 3,065 | 1,581 | 1,290 | 1,194 | 1,036 | 911 | 807 | 6,819 | 599 | 556 | 383 | 1,538 |
| Total | 0 | 3,947 | 2,754 | 6,701 | 3,489 | 2,920 | 2,736 | 2,549 | 2,284 | 2,067 | 16,045 | 1,614 | 1,589 | 1,104 | 4,307 |

**Private**

| | Creche/Nursery | Kindergarten | | | Primary | | | | | | | JHS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | KG1 | KG2 | TOTAL | P1 | P2 | P3 | P4 | P5 | P6 | TOTAL | JH1 | JH2 | JH3 | TOTAL |
| Boys | 372 | 383 | 166 | 549 | 137 | 111 | 102 | 86 | 63 | 56 | 555 | 0 | 0 | 0 | 0 |
| Girls | 337 | 283 | 177 | 460 | 136 | 117 | 89 | 70 | 72 | 40 | 524 | 0 | 0 | 0 | 0 |
| Total | 709 | 666 | 343 | 1,009 | 273 | 228 | 191 | 156 | 135 | 96 | 1,079 | 0 | 0 | 0 | 0 |

#### BECE Core Subjects Pass Rates - 2008[1]

| | Maths | | | English | | | Science | | | Social Studies | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Pass | % Pass | Total | Pass | % Pass | Total | Pass | % Pass | Total | Pass | % Pass |
| Boys | 647 | 257 | 39.7% | 647 | 249 | 38.5% | 647 | 390 | 60.3% | 647 | 238 | 36.8% |
| Girls | 274 | 82 | 29.9% | 275 | 92 | 33.5% | 274 | 147 | 53.6% | 274 | 63 | 23.0% |
| Total | 921 | 339 | 36.8% | 922 | 341 | 37.0% | 921 | 537 | 58.3% | 921 | 301 | 32.7% |

#### Enrolment Rates - 2008/2009

**Creche/Nursery Enrolment Rates**

| | TOTAL | Boys | Girls |
|---|---|---|---|
| *Popn( 0-3yrs)* | 15,543 | 7,522 | 8,021 |
| *Tot. Enrol* | 709 | 372 | 337 |
| *GER [2]* | 4.6% | 4.9% | 4.2% |
| *Enrol( 0-3yrs)* | 637 | 342 | 295 |
| *NER [3]* | 4.1% | 4.5% | 3.7% |

**KG Enrolment Rates**

| | TOTAL | Boys | Girls |
|---|---|---|---|
| *Popn( 4-5yrs)* | 8,897 | 4,374 | 4,523 |
| *Tot. Enrol* | 7,710 | 4,185 | 3,525 |
| *GER [2]* | 86.7% | 95.7% | 77.9% |
| *Enrol( 4-5yrs)* | 6,142 | 3,299 | 2,843 |
| *NER [3]* | 69.0% | 75.4% | 62.9% |
| *GPI [6]* | 0.81 | | |

**Primary Enrolment Rates**

| | TOTAL | Boys | Girls |
|---|---|---|---|
| *Popn(6-11yrs)* | 20,581 | 10,625 | 9,956 |
| *Tot. Enrol* | 17,124 | 9,781 | 7,343 |
| *GER [2]* | 83.2% | 92.1% | 73.8% |
| *Enrol(6-11yrs)* | 16,073 | 9,109 | 6,964 |
| *NER [3]* | 78.1% | 85.7% | 69.9% |
| *GAR [4]* | 88.5% | 96.5% | 80.5% |
| *NAR [5]* | 74.3% | 81.8% | 66.8% |
| *Completion Rate* | 88.6% | 95.4% | 76.9% |
| *GPI [6]* | 0.80 | | |

**JHS Enrolment Rates**

| | TOTAL | Boys | Girls |
|---|---|---|---|
| *Popn(12-14yrs)* | 5,934 | 3,431 | 2,503 |
| *Tot. Enrol* | 4,307 | 2,769 | 1,538 |
| *GER [2]* | 72.6% | 80.7% | 61.4% |
| *Enrol(12-14yrs)* | 1,650 | 1,003 | 647 |
| *NER [3]* | 27.8% | 29.2% | 25.8% |
| *GAR [4]* | 72.6% | 80.7% | 66.1% |
| *NAR [5]* | 18.8% | 20.4% | 16.7% |
| *Completion Rate* | 57.8% | 64.1% | 48.7% |
| *GPI [6]* | 0.76 | | |

* Population is based on 2000 National Population Census (Source: GSS) and an assumed annual growth rate of: 2.7%

1 BECE Exam Scores on each Test Range 1-9. "Passing" Represents Grades of 1-6

2 Gross Enrolment Ratio

3 Net Enrolment Rate

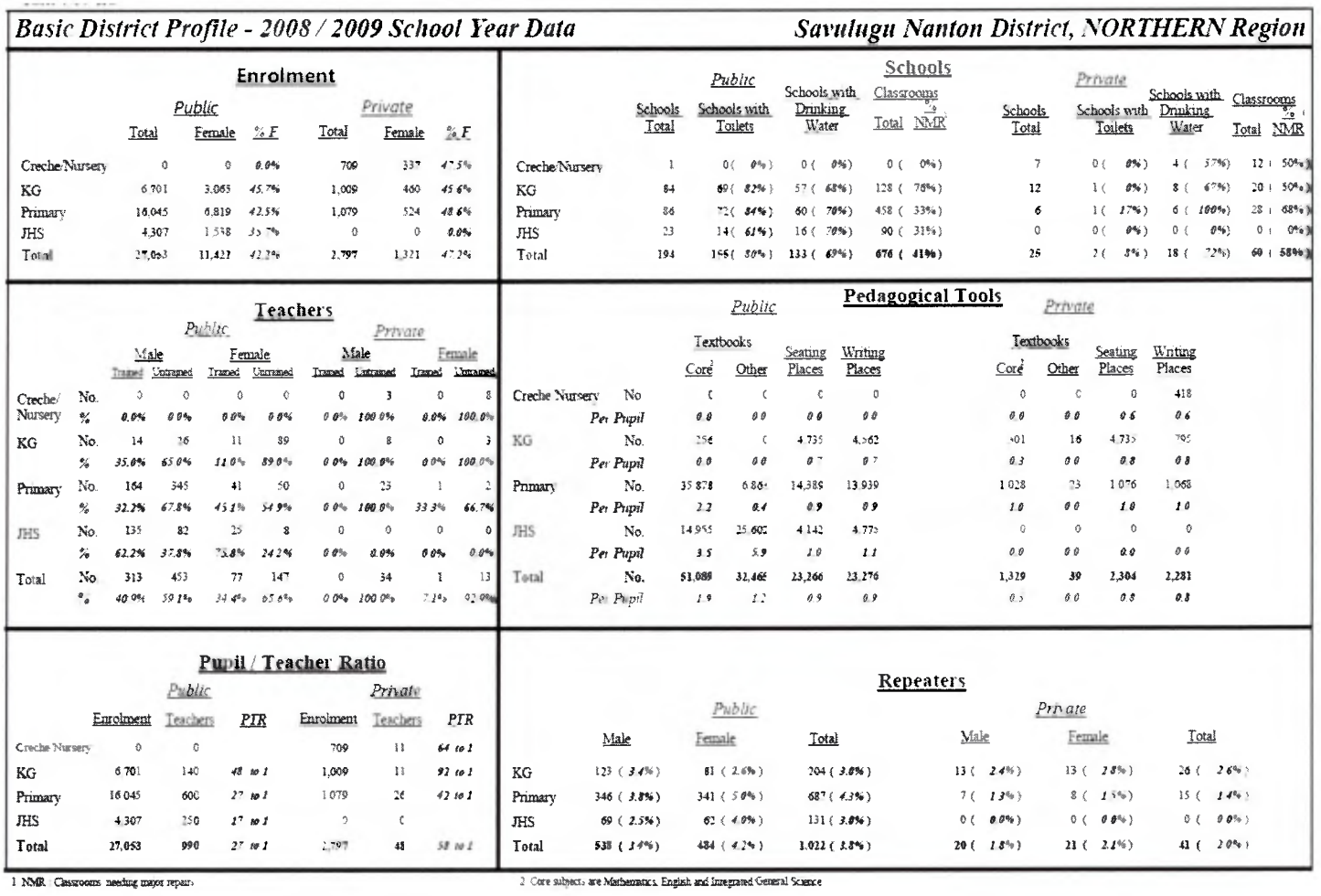
4 Gross Admission Ratio

5 Net Admission Rate

6 Gender Parity Index

Source: MoE EMIS (2009)

## Appendix D4: EMIS Basic Education District Profile for Savelugu-Nanton 2008/9



*Basic District Profile - 2008 / 2009 School Year Data* — *Savulugu Nanton District, NORTHERN Region*

**Enrolment**

| | Public Total | Public Female | Public % F | Private Total | Private Female | Private % F |
|---|---|---|---|---|---|---|
| Creche/Nursery | 0 | 0 | 0.0% | 709 | 337 | 47.5% |
| KG | 6,701 | 3,065 | 45.7% | 1,009 | 460 | 45.6% |
| Primary | 16,045 | 6,819 | 42.5% | 1,079 | 524 | 48.6% |
| JHS | 4,307 | 1,538 | 35.7% | 0 | 0 | 0.0% |
| Total | 27,053 | 11,422 | 42.2% | 2,797 | 1,321 | 47.2% |

**Schools**

| | Public Schools Total | Public Schools with Toilets | Public Schools with Drinking Water | Public Classrooms Total | Public Classrooms % NMR | Private Schools Total | Private Schools with Toilets | Private Schools with Drinking Water | Private Classrooms Total | Private Classrooms % NMR |
|---|---|---|---|---|---|---|---|---|---|---|
| Creche/Nursery | 1 | 0 ( 0% ) | 0 ( 0% ) | 0 ( 0% ) | | 7 | 0 ( 0% ) | 4 ( 57% ) | 12 | 50% |
| KG | 84 | 69 ( 82% ) | 57 ( 68% ) | 128 ( 78% ) | | 12 | 1 ( 8% ) | 8 ( 67% ) | 20 | 50% |
| Primary | 86 | 72 ( 84% ) | 60 ( 70% ) | 458 ( 33% ) | | 6 | 1 ( 17% ) | 6 ( 100% ) | 28 | 68% |
| JHS | 23 | 14 ( 61% ) | 16 ( 70% ) | 90 ( 31% ) | | 0 | 0 ( 0% ) | 0 ( 0% ) | 0 | 0% |
| Total | 194 | 155 ( 80% ) | 133 ( 69% ) | 676 ( 41% ) | | 25 | 2 ( 8% ) | 18 ( 72% ) | 60 | 58% |

**Teachers**

| | | Public Male Trained | Public Male Untrained | Public Female Trained | Public Female Untrained | Private Male Trained | Private Male Untrained | Private Female Trained | Private Female Untrained |
|---|---|---|---|---|---|---|---|---|---|
| Creche/ Nursery | No. | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 8 |
| | % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100.0% | 0.0% | 100.0% |
| KG | No. | 14 | 16 | 11 | 89 | 0 | 8 | 0 | 3 |
| | % | 35.0% | 65.0% | 11.0% | 89.0% | 0.0% | 100.0% | 0.0% | 100.0% |
| Primary | No. | 164 | 345 | 41 | 50 | 0 | 23 | 1 | 2 |
| | % | 32.2% | 67.8% | 45.1% | 54.9% | 0.0% | 100.0% | 33.3% | 66.7% |
| JHS | No. | 135 | 82 | 25 | 8 | 0 | 0 | 0 | 0 |
| | % | 62.2% | 37.8% | 75.8% | 24.2% | 0.0% | 0.0% | 0.0% | 0.0% |
| Total | No. | 313 | 453 | 77 | 147 | 0 | 34 | 1 | 13 |
| | % | 40.9% | 59.1% | 34.4% | 65.6% | 0.0% | 100.0% | 7.1% | 92.9% |

**Pedagogical Tools**

| | | Public Textbooks Core[2] | Public Textbooks Other | Public Seating Places | Public Writing Places | Private Textbooks Core[2] | Private Textbooks Other | Private Seating Places | Private Writing Places |
|---|---|---|---|---|---|---|---|---|---|
| Creche Nursery | No | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 418 |
| | Per Pupil | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.6 |
| KG | No. | 256 | 0 | 4,735 | 4,562 | 501 | 16 | 4,735 | 795 |
| | Per Pupil | 0.0 | 0.0 | 0.7 | 0.7 | 0.3 | 0.0 | 0.8 | 0.8 |
| Primary | No. | 35,878 | 6,884 | 14,388 | 13,939 | 1,028 | 23 | 1,076 | 1,068 |
| | Per Pupil | 2.2 | 0.4 | 0.9 | 0.9 | 1.0 | 0.0 | 1.0 | 1.0 |
| JHS | No. | 14,955 | 25,602 | 4,142 | 4,773 | 0 | 0 | 0 | 0 |
| | Per Pupil | 3.5 | 5.9 | 1.0 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | No. | 51,089 | 32,486 | 23,266 | 23,276 | 1,329 | 39 | 2,304 | 2,281 |
| | Per Pupil | 1.9 | 1.2 | 0.9 | 0.9 | 0.5 | 0.0 | 0.8 | 0.8 |

**Pupil / Teacher Ratio**

| | Public Enrolment | Public Teachers | Public PTR | Private Enrolment | Private Teachers | Private PTR |
|---|---|---|---|---|---|---|
| Creche Nursery | 0 | 0 | | 709 | 11 | 64 to 1 |
| KG | 6,701 | 140 | 48 to 1 | 1,009 | 11 | 92 to 1 |
| Primary | 16,045 | 600 | 27 to 1 | 1,079 | 26 | 42 to 1 |
| JHS | 4,307 | 250 | 17 to 1 | 0 | 0 | |
| Total | 27,053 | 990 | 27 to 1 | 2,797 | 48 | 58 to 1 |

**Repeaters**

| | Public Male | Public Female | Public Total | Private Male | Private Female | Private Total |
|---|---|---|---|---|---|---|
| KG | 123 ( 3.4% ) | 81 ( 2.6% ) | 204 ( 3.0% ) | 13 ( 2.4% ) | 13 ( 2.8% ) | 26 ( 2.6% ) |
| Primary | 346 ( 3.8% ) | 341 ( 5.0% ) | 687 ( 4.3% ) | 7 ( 1.3% ) | 8 ( 1.5% ) | 15 ( 1.4% ) |
| JHS | 69 ( 2.5% ) | 62 ( 4.0% ) | 131 ( 3.0% ) | 0 ( 0.0% ) | 0 ( 0.0% ) | 0 ( 0.0% ) |
| Total | 538 ( 3.4% ) | 484 ( 4.2% ) | 1,022 ( 3.8% ) | 20 ( 1.8% ) | 21 ( 2.1% ) | 41 ( 2.0% ) |

1 NMR : Classrooms needing major repairs

2 Core subjects are Mathematics, English and Integrated General Science

Source: MoE EMIS (2009)

## Appendix D5: EMIS Data Summary Table: Basic Education National Enrolment Data (All Ghana) 2008/9

### BASIC National Level Enrolment Data

#### Enrolment Data - 2008/2009

**Public**

| | Preschool | | | | Primary | | | | | | | JHS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Creche/Nursery | KG1 | KG2 | TOTAL | P1 | P2 | P3 | P4 | P5 | P6 | TOTAL | JH1 | JH2 | JH3 | TOTAL |
| Boys | 17,968 | 314,279 | 226,835 | 541,114 | 304,335 | 278,469 | 274,198 | 259,894 | 235,985 | 217,426 | 1,570,307 | 205,335 | 191,688 | 175,844 | 572,867 |
| Girls | 17,884 | 311,998 | 225,861 | 537,859 | 293,973 | 268,216 | 260,245 | 241,220 | 215,100 | 192,834 | 1,471,588 | 181,251 | 165,939 | 144,031 | 491,221 |
| Total | 35,852 | 626,277 | 452,696 | 1,078,973 | 598,308 | 546,685 | 534,443 | 501,114 | 451,085 | 410,260 | 3,041,895 | 386,586 | 357,627 | 319,875 | 1,064,088 |

**Private**

| | Preschool | | | | Primary | | | | | | | JHS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Creche/Nursery | KG1 | KG2 | TOTAL | P1 | P2 | P3 | P4 | P5 | P6 | TOTAL | JH1 | JH2 | JH3 | TOTAL |
| Boys | 89,462 | 68,098 | 62,610 | 130,708 | 66,397 | 62,115 | 59,583 | 54,530 | 49,618 | 45,682 | 337,925 | 39,736 | 38,216 | 34,280 | 112,232 |
| Girls | 87,321 | 67,054 | 61,719 | 128,773 | 64,686 | 60,762 | 57,856 | 54,192 | 48,379 | 44,952 | 330,827 | 39,436 | 37,530 | 32,291 | 109,257 |
| Total | 176,783 | 135,152 | 124,329 | 259,481 | 131,083 | 122,877 | 117,439 | 108,722 | 97,997 | 90,634 | 668,752 | 79,172 | 75,746 | 66,571 | 221,489 |

#### BECE Core Subjects Pass Rates - 2008[1]

| | Maths | | | English | | | Science | | | Social Studies | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Pass | % Pass | Total | Pass | % Pass | Total | Pass | % Pass | Total | Pass | % Pass |
| Boys | 184,560 | 114,367 | 62.0% | 184,590 | 110,259 | 59.7% | 184,584 | 117,256 | 63.5% | 184,614 | 114,292 | 61.9% |
| Girls | 151,637 | 85,482 | 56.4% | 151,655 | 92,691 | 61.1% | 151,663 | 86,414 | 57.0% | 151,682 | 83,882 | 55.3% |
| Total | 336,197 | 199,849 | 59.4% | 336,245 | 202,950 | 60.4% | 336,247 | 203,670 | 60.6% | 336,296 | 198,174 | 58.9% |

#### Enrolment Rates - 2008/2009

| | Creche/Nursery Enrolment Rates | | |
|---|---|---|---|
| | TOTAL | Boys | Girls |
| *Popn( 0-3yrs) | 2,705,885 | 1,348,456 | 1,357,429 |
| Tot. Enrol | 212,635 | 107,430 | 105,205 |
| GER[2] | 7.9% | 8.0% | 7.8% |
| Enrol( 0-3yrs) | 167,418 | 84,224 | 83,194 |
| NER[3] | 6.2% | 6.2% | 6.1% |

| | KG Enrolment Rates | | |
|---|---|---|---|
| | TOTAL | Boys | Girls |
| *Popn( 4-5yrs) | 1,441,443 | 718,262 | 723,181 |
| Tot. Enrol | 1,338,454 | 671,822 | 666,632 |
| GER[2] | 92.9% | 93.5% | 92.2% |
| Enrol( 4-5yrs) | 916,455 | 459,911 | 456,544 |
| NER[3] | 63.6% | 64.0% | 63.1% |
| GPI[6] | 0.99 | | |

| | Primary Enrolment Rates | | |
|---|---|---|---|
| | TOTAL | Boys | Girls |
| *Popn(6-11yrs) | 3,910,349 | 1,967,784 | 1,942,565 |
| Tot. Enrol | 3,710,647 | 1,908,232 | 1,802,415 |
| GER[2] | 94.9% | 97.0% | 92.8% |
| Enrol(6-11yrs) | 3,461,087 | 1,763,061 | 1,698,026 |
| NER[3] | 88.5% | 89.6% | 87.4% |
| GAR[4] | 102.9% | 104.7% | 101.1% |
| NAR[5] | 72.1% | 72.7% | 71.5% |
| Completion Rate | 86.3% | 89.3% | 83.2% |
| GPI[6] | 0.96 | | |

| | JHS Enrolment Rates | | |
|---|---|---|---|
| | TOTAL | Boys | Girls |
| *Popn(12-14yrs) | 1,595,620 | 815,100 | 780,520 |
| Tot. Enrol | 1,285,277 | 684,113 | 601,164 |
| GER[2] | 80.6% | 83.9% | 77.0% |
| Enrol(12-14yrs) | 762,898 | 390,422 | 372,476 |
| NER[3] | 47.8% | 47.9% | 47.7% |
| GAR[4] | 84.6% | 87.3% | 81.7% |
| NAR[5] | 43.6% | 44.0% | 43.3% |
| Completion Rate | 75.0% | 79.7% | 70.1% |
| GPI[6] | 0.92 | | |

* Population is based on 2000 National Population Census (Source: GSS) and an assumed annual growth rate of 2.7%

1. BECE Exam Scores on each Test Range 1-9. "Passing" Represents Grades of 1-5.
2. Gross Enrolment Ratio
3. Net Enrolment Rate
4. Gross Admission Ratio
5. Net Admission Rate
6. Gender Parity Index

Source: MoE EMIS (2009)

## Appendix D6: EMIS Basic Education National Profile (All Ghana) 2008/9

*Basic National Profile - 2008 / 2009 School Year Data*

### Enrolment

| | Public Total | Public Female | Public % F | Private Total | Private Female | Private % F |
|---|---|---|---|---|---|---|
| Creche/Nursery | 358,852 | 177,884 | 49.6% | 176,783 | 87,321 | 49.4% |
| KG | 1,078,973 | 537,859 | 49.8% | 259,481 | 128,773 | 49.6% |
| Primary | 3,041,895 | 1,471,588 | 48.4% | 668,752 | 330,827 | 49.5% |
| JHS | 1,064,088 | 491,221 | 46.2% | 221,189 | 109,943 | 49.7% |
| **Total** | **5,220,808** | **2,518,552** | **48.2%** | **1,326,205** | **656,864** | **49.5%** |

### Schools

| | Public Schools Total | Public Schools with Toilets | Public Schools with Drinking Water | Public Classrooms Total | Public Classrooms % NMR[1] | Private Schools Total | Private Schools with Toilets | Private Schools with Drinking Water | Private Classrooms Total | Private Classrooms % NMR |
|---|---|---|---|---|---|---|---|---|---|---|
| Creche/Nursery | 770 | 371 ( 48% ) | 429 ( 56% ) | 682 | ( 20% ) | 3,385 | 2,837 ( 84% ) | 2,747 ( 81% ) | 5,132 | ( 5% ) |
| KG | 11,827 | 5,958 ( 50% ) | 7,451 ( 63% ) | 20,154 | ( 34% ) | 4,612 | 3,726 ( 81% ) | 3,686 ( 80% ) | 8,259 | ( 9% ) |
| Primary | 13,510 | 6,822 ( 50% ) | 8,398 ( 62% ) | 76,393 | ( 25% ) | 4,371 | 3,548 ( 81% ) | 3,492 ( 80% ) | 23,660 | ( 9% ) |
| JHS | 7,656 | 4,152 ( 54% ) | 4,767 ( 62% ) | 28,007 | ( 26% ) | 2,557 | 2,196 ( 86% ) | 2,078 ( 81% ) | 8,016 | ( 7% ) |
| **Total** | **33,763** | **17,303 ( 51% )** | **21,045 ( 62% )** | **125,236** | **( 27% )** | **14,925** | **12,307 ( 82% )** | **12,003 ( 80% )** | **45,067** | **( 8% )** |

### Teachers

| | | Public Male Trained | Public Male Untrained | Public Female Trained | Public Female Untrained | Private Male Trained | Private Male Untrained | Private Female Trained | Private Female Untrained |
|---|---|---|---|---|---|---|---|---|---|
| Creche/ Nursery | No. | 31 | 106 | 184 | 711 | 80 | 468 | 242 | 5,380 |
| | % | 22.6% | 77.4% | 20.6% | 79.4% | 14.6% | 85.4% | 4.3% | 95.7% |
| KG | No. | 1,314 | 3,184 | 7,892 | 17,021 | 141 | 1,602 | 427 | 6,132 |
| | % | 29.2% | 70.8% | 31.7% | 68.3% | 8.1% | 91.9% | 6.5% | 93.5% |
| Primary | No. | 27,075 | 29,732 | 24,920 | 7,267 | 2,057 | 16,756 | 881 | 5,733 |
| | % | 47.7% | 52.3% | 77.4% | 22.6% | 10.9% | 89.1% | 13.3% | 86.7% |
| JHS | No. | 31,517 | 12,326 | 13,904 | 1,467 | 2,994 | 11,132 | 567 | 1,502 |
| | % | 71.9% | 28.1% | 90.5% | 9.5% | 21.2% | 78.8% | 27.4% | 72.6% |
| Total | No. | 59,937 | 45,348 | 46,900 | 26,466 | 5,272 | 29,958 | 2,117 | 18,747 |
| | % | 56.9% | 43.1% | 63.9% | 36.1% | 15.0% | 85.0% | 10.1% | 89.9% |

### Pedagogical Tools

| | | Public Textbooks Core[2] | Public Textbooks Other | Public Seating Places | Public Writing Places | Private Textbooks Core[2] | Private Textbooks Other | Private Seating Places | Private Writing Places |
|---|---|---|---|---|---|---|---|---|---|
| Creche/Nursery | No | 0 | 0 | 23,366 | 21,524 | 0 | 0 | 23,366 | 170,835 |
| | Per Pupil | 0.0 | 0.0 | 0.7 | 0.6 | 0.0 | 0.0 | 1.0 | 1.0 |
| KG | No. | 78,407 | 45,892 | 544,384 | 504,279 | 48,901 | 28,040 | 544,384 | 244,186 |
| | Per Pupil | 0.1 | 0.0 | 0.5 | 0.5 | 0.2 | 0.1 | 0.9 | 0.9 |
| Primary | No. | 4,941,002 | 847,782 | 2,323,967 | 2,271,163 | 859,503 | 379,223 | 639,269 | 645,805 |
| | Per Pupil | 1.6 | 0.3 | 0.8 | 0.7 | 1.3 | 0.6 | 1.0 | 1.0 |
| JHS | No. | 2,253,469 | 4,609,991 | 827,316 | 816,791 | 400,081 | 795,118 | 226,399 | 230,360 |
| | Per Pupil | 2.1 | 4.3 | 0.8 | 0.8 | 1.8 | 3.6 | 1.0 | 1.0 |
| Total | No. | 7,272,878 | 5,503,665 | 3,719,033 | 3,613,757 | 1,308,485 | 1,202,381 | 1,279,593 | 1,291,186 |
| | Per Pupil | 1.4 | 1.1 | 0.7 | 0.7 | 1.0 | 0.9 | 1.0 | 1.0 |

### Pupil / Teacher Ratio

| | Public Enrolment | Public Teachers | Public PTR | Private Enrolment | Private Teachers | Private PTR |
|---|---|---|---|---|---|---|
| Creche/Nursery | 358,852 | 1,052 | 35 to 1 | 176,783 | 6,170 | 29 to 1 |
| KG | 1,078,973 | 29,411 | 37 to 1 | 259,481 | 8,302 | 31 to 1 |
| Primary | 3,041,895 | 88,994 | 34 to 1 | 668,752 | 25,427 | 26 to 1 |
| JHS | 1,064,088 | 59,214 | 18 to 1 | 221,189 | 16,195 | 14 to 1 |
| **Total** | **5,220,808** | **178,651** | **29 to 1** | **1,326,205** | **56,094** | **24 to 1** |

### Repeaters

| | Public Male | Public Female | Public Total | Private Male | Private Female | Private Total |
|---|---|---|---|---|---|---|
| KG | 18,733 ( 3.5% ) | 17,599 ( 3.3% ) | 36,332 ( 3.4% ) | 2,689 ( 2.1% ) | 2,578 ( 2.0% ) | 5,267 ( 2.0% ) |
| Primary | 62,479 ( 4.0% ) | 66,693 ( 4.5% ) | 129,172 ( 4.2% ) | 5,412 ( 1.6% ) | 5,236 ( 1.6% ) | 10,648 ( 1.6% ) |
| JHS | 19,606 ( 3.4% ) | 16,780 ( 3.4% ) | 36,386 ( 3.4% ) | 1,951 ( 1.8% ) | 1,896 ( 1.7% ) | 3,847 ( 1.7% ) |
| **Total** | **100,818 ( 3.8% )** | **101,072 ( 4.0% )** | **201,890 ( 3.9% )** | **10,052 ( 1.7% )** | **9,710 ( 1.7% )** | **19,762 ( 1.7% )** |

1. NMR : Classrooms needing major repairs

2. Core subjects are Mathematics, English and Integrated General Science

Source: MoE EMIS (2009)

## Appendix E: Instruments for Secondary Study

### Appendix E1: Participant's Information Sheet

PARTICIPANTS' INFORMATION SHEET

WELFARE, POVERTY AND THE ECONOMIC BENEFITS OF EDUCATION IN GHANA

*Introduction*

This research project is being conducted as part of Caine Rolleston's PhD work at The Institute of Education, University of London. It is also linked to CREATE's (Consortium for Research on Educational Access Transitions and Equity) Community and Schools Survey – an ongoing data collection exercise taking place at schools and in households in Savelugu-Nanton District of Ghana.

Savelugu-Nanton has been in the past associated with lower levels of schooling and higher levels of household poverty than average in Ghana. This research project began by using secondary data from surveys collected by the Ghana Statistical Service to look at issues of the benefits of education in terms of reducing household poverty as well as the effects of poverty on children's schooling.

This stage of the research focuses on the particular case of Savelugu-Nanton district in order to shed light on the issues at a local level and to explore the issues from a community perspective. Data is being collected through individual and group interviews with key informants.

Your views are very much appreciated and make an important contribution to the research.

*Consent and Confidentiality*

If you consent to take part in the study be being interviewed, please note that:

- The purpose of the study is not to attribute views to individuals personally
- Personal information will be held in confidence at all times
- Findings will be presented anonymously
- You may choose not to answer any particular question or questions
- You may choose to withdraw from the interview at any time
- If you wish to receive a copy of the finding by email please provide an email address

## Appendix E2: Interview Schedule (Key Informants)

### WELFARE, POVERTY AND THE ECONOMIC BENEFITS OF EDUCATION IN GHANA

This research project is being conducted as part of Caine Rolleston's PhD work at The Institute of Education, University of London. More details are available on the participants' information sheet.

I wish to stress that there are no RIGHT and WRONG answers to these questions. I am simply interested in your views. Your views are very much appreciated and make an important contribution to the research.

School Name: _____ (Pri/JSS/Both) _____ H/T gender (M/F)_____

Approximate Number of Pupils/FTE Teachers____/____

*I confirm that I have read the information sheet, understand that participation is voluntary, agree to the interview being recorded and to taking part in the study.*

Name_____

Date_____

**1. Community Culture and Perceptions**

*Can you tell me about the community your school/circuit/district serves? Can you say something about the particular cultural issues that may affect education? For example, do you think education is valued highly in the community? Do people sometimes think that it is more productive for children to work? Why / why not? Do people associate education with significant economic benefits? What about other benefits such as health or family planning?*

*Can you explain the differences in attitude towards girls and boys in relation to school and work in this community? Can you explain how girls are affected by the practice of fostering or adoption by aunts? Are there other effects of household and family structure e.g. including polygamy and large household size in Ghanaian terms? Can you explain how they are affected by betrothal, early pregnancy and early marriage? What are the perceptions of girls' abilities to succeed in school when compared to boys?*

*Are there other cultural issues of importance in making decisions about education in this community? What about deciding when to enrol children as many are significantly 'over-age'?*

**2. Local Labour Markets and Household Income Generation**

*Adults' Work*

*What are the main opportunities and sources of livelihood for adults in this community/these communities? Have these changed much in the last 20 years? What about opportunities for more educated adults? Have these changed? Are these adults usually better-off in terms of income? Why / why not?*

*What would you say are the main reasons for poverty among the least well off groups in the community? And conversely, what are the reasons for the wealth of the most advantaged? Does education play a part?*

*Apart from a main job, enterprise or farm, how else do people earn/get money? Are remittances (domestic and international) important? Who receives them from whom? What about rents and other incomes from assets? Who receives them and why?*

***Children's Work***

*What are the main opportunities for (a) boys and (b) girls to work in the community(ies)? Do they work out of necessity or is there a degree of choice by the child/family? When do households most rely on their children working? When does work most often impact on schooling? And how? Does the work done benefit from any skills acquired through schooling do you think? Does a child's going into work depend on their ability/performance at school or more on the work done by the family and the family circumstances?*

*Can you explain the effect on girls' education of domestic work (especially if fostered), childcare and migration e.g for 'kayaye'.*

*In your experience of children who have finished schooling, what are the main livelihoods they go into? Are these different from their parents' generation or mostly similar? How? Does it depend on the level of education attained? Do the educated/less educated migrate? Why?*

**3. Education Provision and Community Level / Wider Initiatives**

*Are there enough basic school places in the community? At what stage does availability of school places start to affect how many children can progress - Primary, JHS or SHS? Can you explain? Does this have the effect of deterring families from enrolling their children earlier on?*

*Do the costs of basic education in terms of fees or indirect costs like transportation deter poor families from enrolling (and retaining) their children in primary school? JHS? SHS?*

*Thinking about the poorest households in the community, what would you say are the main reasons why it may be difficult for their children to compete a full course of basic education?*

*What are your comments about the quality of education provided in this community? What are the views expressed in the community? What about the 'relevance' of education? Do you think issues of quality and relevance influence some parents not to enrol children or to allow them to drop out? Is there evidence that some households prefer alternatives e.g. private schools in Tamale or 'School for Life'?*

*What do you think could be done to improve quality/relevance, especially considering patterns of work in the community? Have you been part of any initiatives intended to do this? Explain?*

*Thinking about initiatives, policies and strategies which have been implemented by your (a) school (b) community (c) district (including national policies) and (d) by NGOs, which do you think have been successful in improving access to schooling? (e.g. Capitation Grant, school feeding, incentives for girls (e.g. Bicycles from UNICEF), PTAs, Sensitisation schemes etc.)*

*Why do you think these were successful? Did they have an impact on the poorest groups? Why / why not?*

**4. Further Issues**

*Are there other issues you would like to mention in relation to the topics we have discussed? Explain*

Thank you for your participation in this interview. Your help in the project is much appreciated.

**Caine Rolleston** **Institute of Education** **University of London**

## Appendix E3: Interview Schedule (Foster Carers)

### ACCESS TO EDUCATION IN SAVELUGU-NANTON, GHANA

### Interview Guide

**1. Family Structure and Fostered children**

- Can you explain how and when your fostered children came to live with you?
- Are any of your biological children fostered? Explain which/why?
- What are the reasons for the fostering arrangements – for you and for the biological parents? (e.g. family bonding, children's work/schooling or training, illness/death/divorce etc.)

- What do you see as the advantages and disadvantages for the children and adults? E.g. do you see it as a privilege or burden? How?
- How long do you expect to look after them for?
- Is your relationship different with fostered and biological children? E.g. discipline/respect/expectations?
- What do you think are the effects of fostering on the child?
- Are any particular difficulties experienced in the fostering relationship?
- What is your extended family structure e.g. is marriage polygamous?
- Which other relatives are important in bringing up your children and why?
- Other comments/observations on fostering in Dagbon?

**2. Education of biological and fostered children**

- Do you expect that your children will eventually complete basic education? Why/why not?
- What difficulties have you experienced in relation to supporting your children's schooling? E.g. costs, distance to travel, quality of schooling?
- Are you responsible for the education of fostered children or do you receive help from other relatives e.g. biological parents?
- Do you expect that your fostered and biological children will reach the same level of schooling? Why/why not?
- Other comments/observations on the education of fostered children? Do you think there are particular issues in educating fostered children?
- How easy is it for your children to access a complete basic education in your area? Explain
- What are your views about the quality and usefulness of the basic education available in your area?
- Other comments/observations on children's basic education in your area?

**3. Children's work and family livelihoods**

- What are the main sources of income for your household?
- Do you sometimes have problems meeting your family's basic needs? Why/Why not?
- What kinds of work do your children do?
- Is this the same for boys/girls? Explain
- Is it the same for fostered/biological children? Explain
- Does their work sometimes mean they don't attend school? Explain – which children are most affected and why?
- Does this affect their progress at school? How?
- Would you say your children are learning important skills in their work? What are they?
- Do you have any children who have gone to live away for work reasons? Where to and why?
- Do you know any children working in Kayaye in the South? Thinking about the children you know, what who were they and why did they go to Kayaye?
- What age would you consider it appropriate for your children to get married – For girls? For boys?
- Do you think that it is more important to educate boys or girls? Why?

## Appendix E4: Background Questionnaire (*Kayaye* workers)

### *KAYAYE* INTERVIEWS, ACCRA, GHANA

This research project is being conducted as part of research work at the Universities of London. I wish to stress that there are no RIGHT and WRONG answers to these questions. I am simply interested in your honest answers. Your views are very much appreciated and make an important contribution to the research.

Interviewer: _____ Interviewee Name _____

Telephone Number _____ Gender _____ Age _____

Place of Origin (Region, District) _____ Urban /Rural _____

Any children of your own? (if yes, give ages) _____

Highest education achieved _____ How long living in Accra? _____

Are you receiving any education/training now? If yes, what? _____

Age when you stopped attending school _____ Grade when you stopped attending _____

Family situation in place of origin e.g. living with biological parents / fostered by aunt

_____

Number of siblings (biological and fostered) who lived with you in the household _____

How often to go back to your hometown/village? _____ per year

Do you send/take money home? If yes, how much? _____ GhC per year

What work do you do now? _____

How much do you earn on average? _____ GhC per day / week / month

What kinds of work did you do in your hometown/village (including domestic chores)

_____

## Appendix E5: Interview Schedule (*Kayaye* workers)

### ACCESS TO EDUCATION IN SAVELUGU-NANTON, GHANA

### Interview Guide

**1. Reasons for migration/*kayaye***

- Can you explain how and when you came to live in Accra?
- Did you receive help or encouragement from friends or family (biological/foster parents) to come here?
- What were the main reasons you chose to leave your home town / village?
- What were the main reasons why you chose Accra?
- Do you plan to return back to your hometown/village? If so, when? What do you hope to do first?
- How would you describe your living conditions here? E.g. food, accommodation, money
- Is it similar to how you expected or different? Explain?

**2. Education**

- Can you say something about your experiences of school in your hometown/village?
- Did you enjoy school? Why/why not?
- Did you have good attendance at school? If not, what affected your attendance?
- What about your school work? Was it satisfactory? If not, why?
- Did you have any other problems with schooling? Explain
- Did the family you lived with (foster or biological) help you with your schooling e.g. with costs or homework? Explain
- If you were not living with your biological parents, did they help in any way? How?
- What were your family's expectations of you in terms of education?
- Did you want to continue schooling further than you did? If so, what were the reasons why you could not?
- Would you like to receive more education/training now? If so, what?

**3. Work and Aspirations**

- Can you say something about your life before – what was your work schedule and what were your responsibilities in the household?
- What were your family's expectations of you in terms of work in adulthood?
- What about your work now?
- Do you earn enough money to live?
- What problems do you experience in your work?
- How does your work life compare to what you were doing in your hometown/village – is it better or worse and why?
- Do you have any ideas about what you would like to do in the future? If so, what?

**4. Family**

- What were the main ways in which your household in the North made a living? Was it difficult? Explain
- How would you describe your relationships with your parents (or foster parents if not living with biological parents before moving to Accra)
- Did the family you were living with before play any part in your decision to move to Accra? E.g. did you want to leave the family? Did they support your decision?
- (Especially girls) Do you intend to prepare for marriage (buying necessary items)? Is this a reason why you came to Accra? Explain
- (Fostered children) Do you think being fostered had any effect on your schooling/work in your home town/village? Did it affect your decision to Accra?

## Appendix F: Principal Components Analysis of Household Assets (Savelugu – Nanton District)

### Table A8.21: Descriptive Statistics for Household Asset Variables

| Variable | N | Mean | Standard Deviation |
|---|---|---|---|
| **Bed** | 720 | 0.918 | 0.274 |
| **Table** | 720 | 0.858 | 0.349 |
| **Stove** | 720 | 0.128 | 0.334 |
| **Refrigerator** | 720 | 0.163 | 0.369 |
| **Fan** | 720 | 0.446 | 0.497 |
| **Wall clock** | 720 | 0.597 | 0.491 |
| **Wrist watch** | 720 | 0.763 | 0.426 |
| **Sewing Machine** | 720 | 0.328 | 0.470 |
| **Radio** | 720 | 0.892 | 0.311 |
| **Telephone** | 720 | 0.022 | 0.148 |
| **Mobile Phone** | 720 | 0.818 | 0.386 |
| **Computer** | 720 | 0.058 | 0.235 |
| **Bicycle** | 720 | 0.872 | 0.334 |
| **Motorbike** | 720 | 0.269 | 0.444 |
| **Car** | 720 | 0.068 | 0.252 |

Source: Computed from ComSS data

### Table A8.22: Results of Principal Components Analysis on Household Assets in Savelugu-Nanton District

| | Principal Components | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| **Bed** | 0.292 | -0.064 | 0.208 | 0.090 | -0.391 | 0.039 | -0.023 | -0.689 |
| **Table** | 0.131 | -0.081 | 0.189 | 0.639 | 0.054 | -0.557 | 0.164 | 0.159 |
| **Stove** | 0.068 | 0.041 | 0.414 | 0.489 | 0.358 | 0.514 | -0.196 | -0.021 |
| **Refrigerator** | 0.276 | 0.232 | -0.405 | 0.173 | -0.161 | 0.153 | 0.065 | 0.214 |
| **Fan** | 0.397 | 0.106 | -0.186 | 0.139 | -0.153 | 0.045 | -0.298 | 0.173 |
| **Wall clock** | 0.390 | 0.022 | 0.064 | -0.092 | -0.017 | -0.154 | -0.420 | -0.031 |
| **Wrist watch** | 0.318 | -0.058 | 0.345 | -0.229 | -0.007 | -0.141 | 0.270 | -0.050 |
| **Sewing Machine** | 0.205 | 0.155 | 0.040 | -0.264 | 0.737 | -0.104 | 0.112 | -0.174 |
| **Radio** | 0.294 | -0.244 | 0.265 | -0.111 | -0.178 | 0.173 | 0.379 | 0.182 |
| **Telephone** | -0.037 | 0.372 | 0.432 | -0.207 | -0.168 | 0.250 | -0.235 | 0.277 |
| **Mobile Phone** | 0.330 | -0.267 | -0.241 | 0.057 | 0.245 | 0.072 | -0.215 | 0.043 |
| **Computer** | 0.024 | 0.520 | 0.201 | 0.046 | -0.046 | -0.270 | 0.119 | 0.234 |
| **Bicycle** | 0.261 | -0.345 | 0.034 | -0.201 | 0.009 | 0.101 | 0.133 | 0.432 |
| **Motorbike** | 0.261 | 0.340 | -0.089 | -0.200 | 0.016 | -0.205 | -0.106 | -0.119 |
| **Car** | 0.176 | 0.346 | -0.248 | 0.153 | 0.031 | 0.348 | 0.539 | -0.152 |
| **Eigenvalue** | **2.757** | **1.847** | **1.261** | **1.159** | **0.972** | **0.873** | **0.855** | **0.801** |
| % Variance | **18.38** | **12.31** | **8.40** | **7.72** | **6.48** | **5.82** | **5.70** | 5.34 |

First 8 Principal Components Reported N=720 Rho=0.702

Source: Computed from ComSS data