

Ghanaian Journal of Economics, Vol. 8, December 2020

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Poverty as a Rural Phenomenon in Ghana: The role of remittance income and child dependency

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Abstract

Ghana's poverty profile shows substantial variations across localities, yet, it is not clear how the determinants vary across these localities. Beyond that, three issues remain puzzling: large household size in rural areas may be a form of resource pooling if there are few child dependents in households; remittance income may reduce poverty likelihood and/or serve as a coping strategy for households; and given that agriculture is the main source of livelihood in rural Ghana, the locality of residence may be crucial in determining all-year-round agricultural activities and poverty likelihoods. To understand the above issues, we test two main hypotheses: that the probability of being poor will be lower in households that receive remittances; and in households with lower child dependency level. First, we use a parametric model to estimate the correlates of poverty in a pooled sample, then we relax the functionality assumption by adopting a non-parametric model to quantify the effects of our key covariates. The results show that while the probability of being poor declines with increase in remittance income, the transfer needs to be at least GH¢800. The likelihood of being poor increases with the number of child dependents in households. The results further reveal the poverty determinants to be heterogeneous within themselves and across localities. Our findings highlight the importance of remittances in households' livelihood strategies and the need for strict and enforceable fertility policies to reduce the burden of child dependency in households.

Keywords: *Poverty; determinants; remittance income; child dependency; Ghana.*

JEL Classification: *I320.*

1. Introduction

Although extreme poverty declined globally from 10.1% (2015) to 9.2% (2017), about 689 million people worldwide still live on less than \$1.90 daily. At a higher poverty line (\$3.20 a day), about 1 in every 4 persons (24.1%) is poor. Even more, 4 out of 5 persons below the international poverty line reside in rural areas¹ – although generally not surprising, it is a terrifying reminder of the vulnerability of the rural population. Prior to the 1990s, more than half of the world's extreme poor lived in East Asia and the Pacific; with fewer than 1 in 5 extremely poor living in Sub-Saharan Africa (SSA). This narrative overturned after the 1990s with over half of the extremely poor living in SSA by 2015² and just about 6% residing in East Asia and the Pacific.³ Poverty is linked to several aspects of life such as education, health, sanitation and the general well-being. It is therefore not surprising that SSA lags behind in almost every indicator of well-being. This means that any policy meant to reduce poverty should be able to address other indicators of well-being. Meanwhile, some of these dimensions of poverty may be interrelated and can be represented as a vicious cycle. For example, people with poor health may not get decent work that may earn them enough to cater for basic necessities. This may further worsen their health conditions and even make them poorer or they may have to spend a greater proportion of their hard-earned incomes on health care services (see for example: Aregbeshola and Khan, 2018; Mchenga *et al.*, 2017; and Gupta and Mitra, 2004); which may make them unable to meet the minimum nutrition for a healthy life.

In another sense, this may affect young children in the family because they may be denied of good education and instead be engaged in some form of income generating activity to support the existing family resources (Moore *et al.*, 2009; Engle and Black, 2008 and Seccombe, K, 2000). The lack or low level of education may negatively affect their future earning potentials and they may also be caught up in a poverty trap. Given the link between poverty and other indicators of well-being, reducing poverty and inequality continue to be central in United Nations' sustainable development goals (SDGs). For instance, SDG 1.1 requires regions and groups within countries to achieve zero poverty at the international poverty line at the end of 2030. This is of course an ambitious goal which requires massive efforts and commitment by governments and other stakeholders given that 2030 is not too far from now.

In Ghana, the poverty level is still high despite the appreciable decline over the years. The most recent report by the Ghana Statistical Service (GSS) for 2016/2017

¹ <https://www.worldbank.org/en/topic/poverty/overview#:~:text=The%20global%20extreme%20poverty%20rate,%245.50%20a%20day%20in%202017>

² <http://datatopics.worldbank.org/world-development-indicators/stories/where-do-the-worlds-poorest-people-live-today.html>

³ <http://datatopics.worldbank.org/world-development-indicators/stories/where-do-the-worlds-poorest-people-live-today.html>

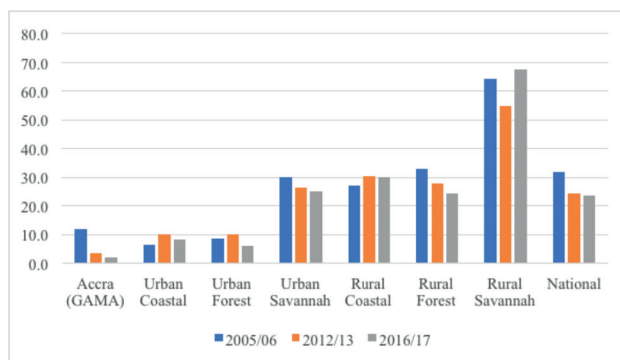
reveals about 1 in every 5 Ghanaians to be poor compared to 1 in every 3 Ghanaians estimated to be poor a decade earlier. At least since the last decade, the country has been known for its achievement of economic growth averaging about 7 percent; and so, placing the country in an enviable position in Africa. Unfortunately, these gains have not been evenly distributed across all parts of the country, leaving evidence of significant regional inequality (Akrofi *et al.*, 2018; Yankson, 2015; and Higgins, 2009). In terms of livelihoods, many of the poor in Ghana work in the agricultural sector as smallholder farmers and their farming practices heavily depend on the weather. This means that the ecological zone in which a person resides may have either direct or indirect role in the nature of agricultural activity (whether food or cash crops, or livestock farming) undertaken; and even whether these activities can be carried out all-year-round. There are seven main ecological zones in Ghana, namely, Accra (GAMA)⁴, urban coastal, urban forest, urban savannah, rural coastal, rural forest, and rural savannah. These zones depict the prevailing variations in climate and hence the vegetation cover – *factors critical to agricultural activities*. In every round of the Ghana Living Standard Survey (GLSS), the poverty profile reveals wide variations in poverty incidence and contribution to total poverty across ecological zones. For instance, the GLSSs 3 and 4 (conducted in 1991/92 and 1998/99 respectively) revealed a significant decline in poverty levels for the entire country and yet some localities (e.g., savannah zones) were completely left out (GSS Report, 2007). In the most recent survey (GLSS 7), the incidence of poverty is massively high in the rural savannah (67.7%), far outweighing the national average (23.4%); and represents over 12.7 percentage points increase relative to the figure recorded in the previous round of the survey (i.e., GLSS 6 (2012/13)). A sharp contrast is seen in GAMA-area where the incidence of poverty is only about 2.0%.

Generally, the incidence of poverty in rural coastal, rural forest and rural savannah has consistently been above the national average in at least the last decade; with the rural savannah recording the highest within the period (Figure 1). On the other hand, the incidence of poverty in the urban zones (Accra (GAMA), urban coastal and urban forest) has typically been below the national average. While this trend reiterates poverty in Ghana as a rural phenomenon, it is also important to note that between 2005/06 and 2016/17, the rates in the urban savannah have not been appreciably different from those recorded for the rural forest and rural coastal. Undoubtedly, there is still some research gap regards uncovering the variations (if any) of poverty incidence across these localities. Apart from Accra (GAMA), urban savannah and rural forest that have seen consistent decline in poverty incidence during the period (2006 – 2017), the trend has been fluctuating in the other ecological zones. Figure 2 further presents the contribution of the various ecological zones to total poverty

⁴ Greater Accra Metropolitan Area (GAMA).

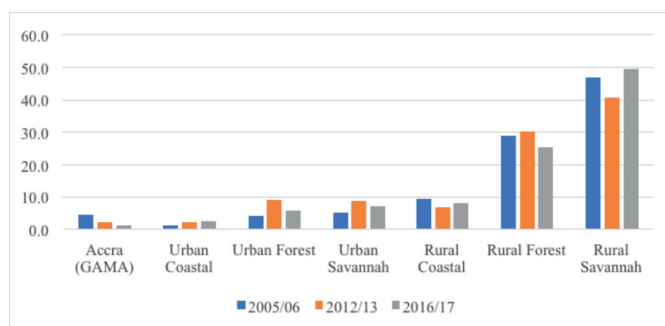
in Ghana; and again, we notice a substantial variation across the ecological zones. Even at the regional level, there is a wide variation in the incidence of poverty and the gap appears to be widening.⁵ For instance, while the GLSS 7 records lower than national average poverty rate (23.4%) in five regions (i.e., Greater Accra, Western, Central, Eastern and Ashanti), the reverse is found in the other five⁶ (GSS, 2017). Coincidentally, all the regions with relatively lower than national average poverty rates are located in the southern part of the country. The southern part which is mainly made up of cocoa-producing regions seems to benefit more in most cases and hence reflects a decline in the country's general poverty levels. On the other hand, the northern part of the country which falls within the savannah zones is typically characterised by worsening poverty level and indeed this kind of trend has prevailed for over two decades.

Figure 1. Poverty incidence in Ghana by ecological zones



Source: Ghana Statistical Service, 2017

Figure 2. Contribution to total poverty by ecological zones



Source: Ghana Statistical Service, 2017

⁵ There are now 16 regions after the creation of six additional regions in 2018. However, the reports and data used in this study are based on the former regional classification.

⁶ i.e., Volta, Brong Ahafo, Northern, Upper East and Upper West regions.

Various reports by the GSS have also revealed appreciable variation in household composition across localities and demographic groups. The GLSS 7 for instance reports an average household size of six members in rural savannah relative to three in urban forest. The composition of households is a reflection of not only the social structure (GSS, 2019) but may be an indication of how resources are shared within households. The empirical evidence on the effect or impact of household size or composition on poverty is somewhat inconclusive even though an overwhelming majority of studies provide evidence of a positive correlation between household size and poverty (e.g., Sekhampu, 2013; Chaudhry and Rahman, 2009; Chaudhry *et al.*, 2009; Virola and Martinez, 2007; and Orbeta, 2005). For instance, at the household level, household size and dependency ratio have been found to increase level and/or intensity of poverty (e.g., Meyer and Nishimwe-Niyimbanira, 2016; Sekhampu, 2013; Chaudhry and Rahman, 2009 and Malik, 1996). All else equal, households with few dependents (such as child dependents) are expected to be relatively better-off because resources may be spared for other purposes (such as savings). On the other hand, for rural communities where agriculture is the main source of livelihood, having large households may provide a cheap source of labour.

Though the trend analysis of poverty in Ghana is an indication that the variations in poverty incidence have existed for a while, it is also worth noting that at least in the last two decades, successive governments have embarked on policies aimed at bridging the north-south disparities. The Savannah Accelerated Development Authority (SADA)⁷ is one of such policies which also provided an alternative livelihood for the poor in the savannah zones. Beyond government policies, remittance inflow constitutes another important source of income for many households; and there is evidence both at the macro and micro levels in relation to the importance of remittances in reducing the likelihood of being poor. At the macro level, remittance inflows (particularly from international sources) constitute a substantial proportion of the gross domestic product (GDP) of recipients' countries. In Ghana, the total remittances estimated for 2018 was about \$3,536 million;⁸ representing about 5.4% of GDP in that year. This remittance inflow value recorded certainly excludes unofficial transfers that did not go through the formal banking sector and other internal inflows. In fact, about 43.2% of households in Ghana received internal remittance in 2016//2017 (GSS, 2017). There is also empirical micro-level evidence that remittances directly affect poverty by increasing recipients' income and expenditures (e.g., Awan *et al.*, 2017; Dey, 2014; Chukwuone *et al.*, 2012; Karymshakov *et al.*, 2014; and Esquivel and Huerta-Pineda, 2007). In this regard, remittance inflows (domestic or international) have received particular interest in the literature and policy-making at least in the last

⁷ SADA was introduced within the period 2012 – 2016.

⁸ <https://www.iom.int/countries/ghana>

two decades. The effect of remittances on households' standard of living may even be greater if amount received is regular and substantial.

With agriculture being the main source of livelihood for rural folks; and Ghana's poverty being characterised as a rural-phenomenon, it may be useful to investigate the poverty determinants across ecological zones. Our variables of interest are the level of child dependency in a household and total remittance income received by the household. The purpose of this study is to go beyond poverty determinants in rural areas by exploring the extent to which correlates of poverty vary across ecological zones; relationship between remittance income and poverty; and child dependency in household and poverty. Therefore, using the most recent data from the Ghana Living Standard Survey (GLSS), the study tests two hypotheses. First, accounting for other covariates, we hypothesise that the probability of being poor will be lower in households that receive remittance(s). Second, we test the hypothesis that households with more child dependents (members below the minimum working age of 15 years) will be more likely to be poor.

Although some empirical evidence reveals that international remittance inflows have stronger effects in reducing poverty than internal or domestic inflows (e.g., Awan *et al.*, 2017; and Adams, 2006), we focus on the effect of domestic/internal remittance inflow on poverty status in Ghana's rural ecological zones for two main reasons. First, the GLSS 7 dataset we use provides information on only internal inflow of remittances. Second, and perhaps most importantly, in the rural areas, migration is typically from rural to urban (or rural-rural);⁹ and so, international migration may not be very common due partly to the existing hardships and the lower likelihood of raising the huge sums of monies required for travelling abroad. Therefore, we posit that domestic remittance inflows may be more common and may have greater impact (if present) in the rural ecological zones than international remittance inflows. Knowing the effect of remittance income on poverty status is useful not just for the households' budgetary decisions but also for family budget studies. Then, we focus on child dependency because of Ghana's relatively young population and high fertility levels particularly in the rural areas. Therefore, a knowledge of the effect of child dependency on poverty is important for public policy particularly in the area of family planning and other public health policies.

The literature identifies both economic and social issues as the main determinants of poverty; and these include inter alia income generating activities, education, gender, geographical location, remittance inflows and other household characteristics (see for example: Awan *et al.*, 2017; Meyer and Nishimwe-Niyimbanira, 2016; Sekhampu, 2013; Adams (2006); Gang *et al.*, 2002; and Okurut *et al.*, 2002). Other analyses

⁹ Mainly to take advantage of the different planting seasons.

of poverty are carried out in a multi-dimensional way whereby the measurement of poverty also includes some environmental and health characteristics. Among the factors revealed as paramount in influencing the likelihood to be poor are religion and ethnicity. Such studies mostly rely on data provided by the Demographic and Health Surveys to show the relationship between poverty and demographic and health correlates (e.g. Filmer and Pritchett, 1999; Sahn and Striffler, 2000; and Achia *et al.*, 2010). These factors have been identified to be paramount in the Ghanaian setting as well. For example, applying the household production theory to Ghana Household Budget Survey data, Kyereime and Thorbecke (1991) identified income, fertility and maturity indices, age, sex, and education to significantly explain household calorie gaps. Poverty-related studies on Ghana have typically been conducted at the national level and/or using rural settings given that poverty is mainly as a rural phenomenon (e.g., Adjasi and Osei, 2007; and Sackey, 2005). Most of these studies support both economic and social factors as key determinants of poverty. For example, in a quest to identify the causes of poverty within the macro, household and community dimension, Canagarajah and Portner (2002) find that, across various poverty levels, there is high correlation within the macro, community and household dimension. In a related study, Adjasi and Osei (2007) reveal inequality within location as the main source of Ghana's inequality. Specifically, the study reveals a household to be less likely to be poor if the household is urban based. The study further reveals that households with heads who are educated and employed in the administrative and managerial sectors are less likely to be poor compared to their counterparts who are neither educated nor employed with such positions.

With respect to our key variables, Adams and Cuecuecha (2013) in using GLSS 5, revealed significant effect of remittance inflow in reducing poverty among households in Ghana; even though the effect is typically argued to be stronger for international inflows. Apart from using relatively older data, it is important to note that their study was conducted for the entire country and did not isolate the rural-specific characteristics that may influence the result. For instance, the effect of domestic inflows may be stronger in the rural areas because the nature of migration in these areas is more likely to be internal (rural-urban or even rural-rural) than international. Therefore, there is still a dearth of empirical studies exploring the source of variation in poverty determinants in Ghana; taking into account such rural-specific characteristics. The country's major social protection programmes; livelihood empowerment against poverty (LEAP) and national health insurance scheme (NHIS) are rolled out nationwide not specifically accounting for differences in poverty determinants across localities. Therefore, the main aim of the current study is to investigate the variation in poverty correlates across the rural ecological zones and to estimate the effect of remittance income and child dependency on poverty status of households.

Carrying out this study is useful both from the Ghanaian and international perspectives. From the Ghanaian perspective, beyond policy purposes, this study is a step in the right direction regards SDG 1.1 which wants regions and groups even within countries to achieve zero poverty at the international poverty line. From an international perspective, worldwide, countries have committed to ending poverty in all its forms everywhere by 2030 under the SDGs. Given the interdependence among countries, the world stands to benefit greatly if this goal is achieved in all countries at the end of the set deadline. It is therefore imperative on each country to device strategies to make this happen. Ghana's attainment of this goal certainly generates some form of positive externality to other countries within the UN; and the current study seeks to provide some insight into variation in poverty correlates across ecological zones and how unconventional strategies such as fertility and budgetary decisions can be capitalised towards achieving this goal.

2. Empirical Approach

2.1. Method of Analysis

In analysing the determinants of poverty, a parametric regression is often used. This approach is simple to implement provided the underlying functionality relating the determinants is known. However, in most cases, the determinants are interrelated and do not follow a unique parametric specification within the entire range. Also, to identify the independent effects of these characteristics on poverty, the variables should be truly exogenous. To circumvent these potential problems, we use a non-parametric (hereafter NP) model, which is a more exotic technique. This approach can unearth a parsimonious number of determinants, and quantifies their effects, even when those effects are highly nonlinear.¹⁰

Also, the parametric regression such as the logistic regression assumes that the log-odds are linear in the covariates. Such constant marginal effect assumptions can be problematic in unearthing the drivers of poverty, where the marginal effects are often expected to be heterogenous across units and levels of other covariates. Functional misspecification of models does not only lead to an invalid estimate, but may also lead to incorrect inferences about the effects of covariates on the outcome variable (see Larson and Bancroft 1963; Ramsey 1969; White 1981; Hardie and Linton 1994; and Sekhon 2009). Model misspecification may also result in omitted variable bias. In addition to the superiority of the non-parametric analysis over parametric models identified above, using the non-parametric approach diffuses the distribution assumptions that is required to attain a significance level for non-normalized data – a characteristic of the data used for this analysis. Therefore, we

¹⁰ Poverty Manual, All, JH Revision of August 8, 2005, p. 135.

estimate a nonparametric regression using both household characteristics (household size, child dependency level, remittance income); attributes of the household head (age, gender, level of formal education, employment status and marital status) and region of residence.¹¹

First, we model the probability of being poor by specifying a logit model with a full set of covariates for the pooled sample (made up of rural and urban areas) as:

$$\logit(poor)_i = \beta_o + X\beta_i + \gamma loc + \theta_n Childdep + \rho_r R + \epsilon_i \dots \dots \dots i = 1, \dots, n \quad (1)$$

Where *loc* is the ecological zone in which the household resides; *Childdep* is the child dependency level in a household; *R* represents remittance income; and *X* is a vector of other covariates; and ϵ is the white noise error term that captures other variables that may influence poverty but not captured in the model. β_o is the intercept; γ measures the effect of the ecological zone; and θ and ρ measure the effect of child dependency and remittance income on the probability of household to be poor, and β_i are the coefficients of the other covariates.

Second, given our interest in uncovering the drivers of poverty across the rural ecological zones, we adopt a NP model and restrict the analysis to these zones (rural savannah, rural forest and rural coastal). The model is specified in equation (2) whereby I is an indicator which represents households in the ecological zones. We do that by using kernel-based regularized least squares estimation and the model estimated is given as:

$$poor_{(h|loc)} = \beta_o + X\beta_i + \theta_n HHdep + \rho_r R + \epsilon_i \dots \dots \dots i = 1, \dots, n, \quad (2)$$

and the definition of all variables remain unchanged.

2.2. Source of Data

The study relies on data from the Ghana Living Standard Survey Round Seven (GLSS7), a nationally representative household survey conducted in 2016/2017 under the World Bank sponsored Living Standard Measurement Surveys (LSMS); and the GLSS7 is the most recent Living Standard Survey available. The GLSS 7 successfully collected detailed information such as demographic characteristics, education, health, employment, migration, tourism, agriculture, and financial services of 14,009 households, representing 93.3% response rate (GSS, 2019). In all, the GLSS used six survey instruments. Information for our empirical estimations is obtained from the Part A questionnaires, specifically on education, health, employment, migration, and housing conditions. These questionnaires are designed based on already existing instruments from the previous surveys with only minimal

¹¹ The region of residence was only controlled in the pooled-sample regression.

modifications to reflect issues regarding the country's labour force. The field work was conducted between October 2016 and October 2017. Apart from the World Bank, the GLSS 7 was financially supported by the Government of Ghana, Department for International Development (DFID) and the Dutch Government.

2.3. Description of Variables

The outcome variable (poverty status) for this study is binary; thus, a household is either "poor" (poor = 1) or "not poor" (poor = 0). The measurement of poverty is based on GLSS7's classification of poverty which adopts the consumption poverty approach. Here, the survey categorises a household as poor (or not) by comparing its standard of living which is computed from the consumption basket of the household, to a minimum acceptable consumption basket (GSS, 2017). We adopt consumption poverty for two main reasons. First, most households in the rural areas practice subsistence agriculture which is largely informal with no regular flow of income to be tracked. Second, for those who are engaged in paid work, some receive in-kind transfers as their remuneration whose quantities may vary depending on the season. Therefore, we argue that using the level of consumption provides a better measure of household's living standard and hence poverty status.

Both key independent variables (remittance income and child dependency) are continuous variables. Remittance incomes are transfers received from migrant members or friends of a household during the reference period. Regarding child dependency in household, we construct a variable to capture all members within the household who are less than the minimum legal working age (15 years). Although the household size provides some information about the structure, a large household with more working adults stands to benefit from pooled resources relative to a household with more child dependents. The characteristics of the household head controlled include: level of formal education (no education, basic, secondary, or tertiary), those with no formal education are used as the referenced category; employment status (employed or not employed; "not employed" are the referenced group); age (in completed years); gender (male or female, with male as the reference group); and marital status (single or married/union). Being single captures whether the respondent has never married, divorced, widowed or separated; and this group is used as the referenced category. The "married" category combines legal marriage and consensual union. The categorisation is done this way to capture the effect of resource pooling which typically occurs in multi-person households. The model also includes household size as a continuous variable. In our first model, we include a ten-categorical dummy capturing the region of residence to account for regional heterogeneities; and GAMA is used as the reference category. However, in the second (main analysis) we drop this variable because of the strong link with the rural ecological zones.

3. Results and Discussion

3.1. Summary Statistics

The Ghana Statistical Service classifies any locality with less than 5,000 population as rural. Rural areas in Ghana are typically characterised by lack or inadequate access to infrastructure (such as health, education, potable drinking water, motorable roads, etc.); which is a major constraint to economic activities and hence to livelihoods. Meanwhile, agriculture is the main source of livelihoods for the rural folks and this is mainly rain-fed. This means that the nature of ecological zone in which one resides is key in terms of all-year-round agricultural production and hence living standards. Therefore, in Table 1, we present the summary statistics for both the pooled sample (column 2) and for the three rural ecological (coastal, forest and savannah) zones in columns 3,4 and 5 respectively. It is important to note that since consumption poverty is measured at the household level and the fact that the head of the household is primarily responsible for decisions in the household, Table 1 presents the background characteristics of both the household and the head of the household as used in the empirical analysis.

Indeed, all three rural ecological zones have higher percentage of poor households compared to the pooled sample; and the rural savannah zone is the worst, with almost half (48.17%) of respondents in that zone being poor. This figure is over three times higher relative to the pooled sample (14.95%). Households are predominantly headed by males in all sub-samples. However, in the rural savannah zone, only about 15% of households are headed by females. There aren't many variations regards the age of household heads across the sub-samples. Over half (53.27%) of the household heads in the rural savannah zone have no formal education; but in the pooled sample, this is about 34%. The rural coastal and rural forest zones also have higher uneducated household heads (44.09% and 39.7% respectively) relative to the average level in the pooled sample. In fact, the percentage declines along the education ladder. In terms of being engaged in some form of economic activity, an overwhelming majority of respondents are employed in all sub-samples. Surprisingly, the rural savannah which has the highest percentage of poor households (48.17%) also has the highest percentage (96.05) of people employed. Perhaps, the type of jobs available there do not reward well.

Rural-urban migration has been increasing in the past decade and most people migrate to the urban areas to find jobs to improve their lives and help their families left behind. Therefore, remittance income (though may not be regular) is arguably important in households' spending decisions. On average, the accumulated income received through remittances (annually) is lower in all three rural ecological zones compared to the average amount (GH¢487.52) in the pooled sample; with the average amount in the rural savannah (GH¢204.56) being over 50% lower. A

household is on average made up four members in the pooled sample, rural coastal and rural forest sub-samples. But in the rural savannah zone, the average household size is five. In Ghana, the minimum acceptable age to work is 15 years. This means that households that have more younger members (below 15 years) have a bigger burden in terms of upkeep of members, and hence might influence their poverty status. From Table 1, about half the size of households are children below 15 years.

Table 1. Summary statistics of households and heads of household

Characteristic	Percentage (mean)			
	Pooled sample	Rural Coastal	Rural Forest	Rural Savannah
Poverty status				
not poor	85.05	82.89	81.99	51.83
poor	14.95	17.11	18.01	48.17
Gender				
male	71.34	69.35	71.17	85.05
female	28.66	30.65	28.83	14.95
Age of household head	43.10	43.47	45.05	40.14
Employment status				
not employed	9.03	7.81	5.91	3.95
employed	90.97	92.19	94.09	96.05
Level of formal education				
none	34.00	44.09	39.7	53.27
basic	37.75	38.23	44.97	22.79
secondary	17.36	11.02	10.34	15.10
tertiary	10.88	6.66	4.99	8.84
Marital status				
single	36.21	33.52	33.87	23.44
married/union	63.79	66.48	66.13	76.56
Income from Remittance	(487.52)	(347.02)	(401.78)	(204.56)
Household size	(3.77)	(3.87)	(3.89)	(4.78)
Child dependency	(1.45)	(1.64)	(1.58)	(2.02)

3.2. Results from empirical estimation

We first present the results from estimating the pooled sample which includes all seven ecological zones as dummies in addition to region of residence to account for regional heterogeneities which may be important in creating economic opportunities and hence influence poverty status. Even though our results do not mean causation they nonetheless provide useful insights in understanding poverty determinants in a way that capitalise on the economic opportunities available to households based on their location. Generally, there are no surprises in terms of the direction of association between the independent and dependent variables (see Table 2).

Generally, the results from Table 2 show that receiving income from remittance inflows decreases the probability of a household becoming poor (0.002) and having a large household (household size) and more child dependents increase the household's probability to be poor. The gender and age of household head are not statistically related to the probability of becoming poor. Using household heads with no formal education as the reference group, having some form of formal education reduces the probability of a household becoming poor and the effect increases with the level of education. Specifically, the log odds are 0.53, 1.02 and 2.29 for basic, secondary, and tertiary education; implying odds of 0.58, 0.36 and 0.11 times of a household becoming poor respectively (all at 1% significance level). As expected, being employed reduces the probability of being poor and though weakly significant, the log of the odds of being poor decreases at a rate of 0.28 for the employed relative to the unemployed. Our results from the pooled sample corroborates the rural-phenomenon of poverty in Ghana. Thus, with Greater Accra-Metropolitan Assembly (GAMA) as the reference category, households in all rural ecological zones are more likely to be poor than their counterparts in the urban zones. The logs of odds of becoming poor are 2.18, 2.21, and 2.7 for rural coastal, rural forest and rural savannah respectively (at 1% significance level).

In line with the study's goal, we focus on only the rural ecological zones; and Table 3 presents the average marginal effects of the non-parametric models for the rural ecological zones. Generally, the results here are qualitatively unchanged. The marginal effects of our key covariates (remittance income and child dependency) have statistically significant effect on household poverty status in all three rural ecological zones and the direction of association are as before. However, the extent of effects varies across the distribution. Therefore, we visualize how and why the marginal effects vary using the locally weighted scatterplot smoothing (hereafter LOWESS) curve and Figures 3 and 4 present the LOWESS curve of the marginal effect of the key covariates. The LOWESS for the child dependency shows that as the number of dependents increases from 0 to 4, the marginal effect on poverty is positive and increases in effect.

Table 2. Average effects of poverty determinants – pooled sample

Variable	Probability
Gender of household head	
Female	-0.0729
Level of Formal Education	
Basic	-0.5380***
Secondary	-1.0176***
Tertiary	-2.2851***
Employment Status	
Employed	-0.2794*
Marital Status	
married / union	-0.0359
Ecological zones	
urban coastal	0.9426
urban forest	0.5588
urban savannah	0.9384
rural coastal	2.1763***
rural forest	2.2098***
rural savannah	2.7147***
Region of residence	
Central	-0.5844**
Accra	-1.5587***
Volta	0.5008**
Eastern	-0.1632
Ashanti	-0.5712*
Brong Ahafo	-0.0698
Northern	0.6958**
Upper East	0.9693***
Upper West	1.2124***
Remittance income	-0.0002***
Child dependency	0.1492***
Household size	0.2021***
Age of household head	0.0008
Constant	-4.0773***
No. of Observations	9830

Note: *** $p < 0.01$; ** $p < 0.05$; and * $p < 0.1$

The effect reduces to zero as child dependents increase to 6, and negative thereafter. This behaviour is consistent for all the rural ecological zones, though with differing magnitudes (see Figure 3). A plausible explanation for this trend may be that with relatively low number of child dependents (i.e., less than 4), households bear the initial huge cost of sustaining the household, and this increases the probability to be poor. However, beyond a certain level (in this case greater than 6), some members probably sacrifice or are compelled to engage in income generating activities to support the household. Another plausible explanation is that with larger child dependency level, older members may be relieved of some household chores which may enable them work for longer hours to sustain the household demands and thereby minimise their susceptibility to poverty. This corroborates evidence of child labour in Ghana (see for example, Afriyie *et al.*, 2019; Takyi, 2014; Owusu and Kwarteye, 2008; and Ranjan, 2002).

Table 3. Average effects of poverty determinants for rural ecological zones

Variable	Rural Coastal	Rural Forest	Rural Savannah
Gender of HH head			
female	0.0200	-0.0308	-0.0345
Level of formal education of HH head			
basic	-0.0604*	-0.0486**	-0.1098***
secondary	-0.0897**	-0.0690**	-0.1109***
tertiary	-0.075348*	-0.0916***	-0.2640***
Current employment status			
employed	0.0174	-0.0053	-0.0378
Marital status			
married/union	-0.0162	-0.0208	-0.0431
Remittance income	3.70E-06	-0.000017*	-0.00015***
Child dependency	0.009*	0.0284***	0.0225**
Household size	0.0257***	0.0208***	0.0528***
Age of household head	0.0006	0.0004	-0.0014

Figure 3a. LOWESS curve for child dependency:¹² Rural coastal

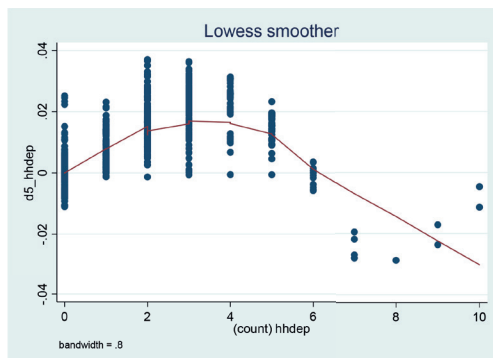


Figure 3b. LOWESS curve for child dependency: Rural forest

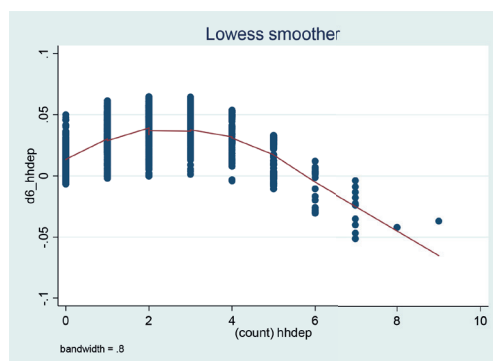
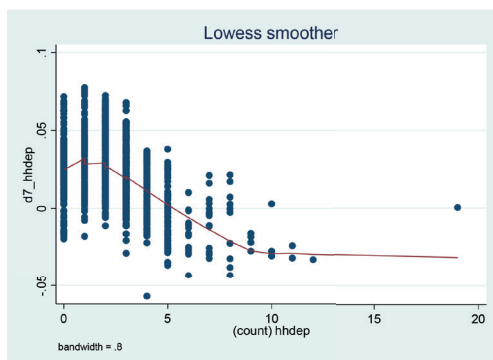
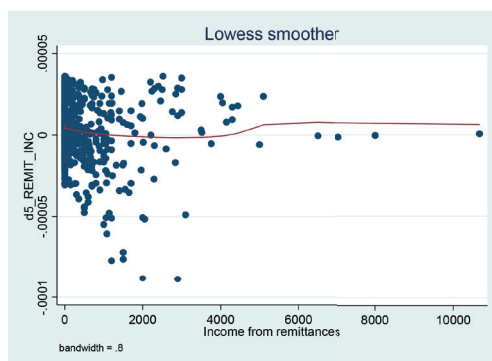
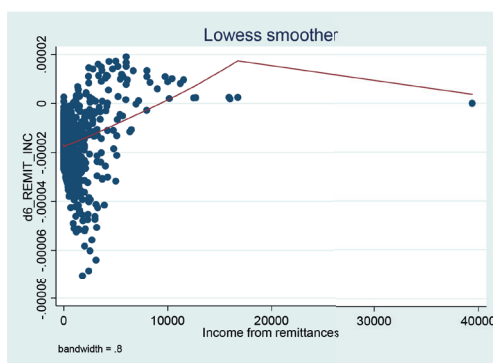
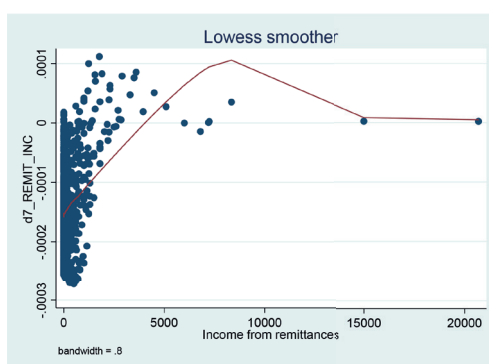


Figure 3c. LOWESS curve for child dependency: Rural savannah



¹² “hhdep” refers to child dependency level (or number) in the household.

Figure 4a. LOWESS curve for remittance income: Rural coastal**Figure 4b. LOWESS curve for remittance income: Rural forest****Figure 4c. LOWESS curve for remittance income: Rural savannah**

Regarding remittance income, even though it is negatively statistically significant in determining the probability of being poor in the rural forest and rural savannah, the association is only weak in the former. We also find that the income from remittances has this potential of reducing poverty only when the amount received is substantial (see Figure 4). Thus, remittance income beyond GH¢1500 and GH¢800 per annum

decreases households' susceptibility to poverty in rural forest and rural savannah, respectively. Typically, for households struggling to make ends meet, it makes sense to see such transfers received being used to finance consumption expenditures and/or debts. On the other hand, for households not too far from the poverty line, income from such transfers may be channelled into investments or productive capacity of households and this may likely happen when the amount received is quite substantial.

4. Conclusion

Poverty in Ghana remains a matter of concern given that 1 in every 5 persons in Ghana is poor (GSS, 2019). With less than a decade to the SDG deadline of ending poverty in all its forms everywhere, this is certainly a cause for worry. Various reports by the Ghana Statistical Service (GSS) and empirical evidence over the years have revealed that poverty in Ghana is largely a rural phenomenon and the literature is vast in terms of determinants of poverty in rural areas. However, what is not clear is how the determinants vary across rural localities; creating a research gap. Although rural households are characterised by large household size, this may be a form of resource pooling and hence reduce the likelihood of being poor if more members are engaged in some form of economic activity. At the same time, the relatively high poverty incidence in the rural areas accompanied by lack of or inadequate access to basic services and income generating activities have contributed to rural-urban migration and households rely on remittances from migrants. The GSS reports 43.2% of households in Ghana received internal remittance in 2016//2017 (GSS, 2017). Yet, it is not clear how remittance income can influence the poverty status of a household. Given that agriculture is the main source of livelihood in rural Ghana and the fact that Ghana's agriculture is rain-fed, the type of ecological zone in which a household is located may be crucial in determining whether or not agricultural activities can be undertaken all-year-round. Therefore, the current study explored the variation in poverty correlates across the rural ecological zones and estimated the effect of remittance income and child dependency on the probability of a household becoming poor.

The results from the parametric model show that the probability of being poor declines along the education ladder; with increase in remittance income; and having employment. On the other hand, the likelihood of being poor increases with household size and the number of child dependents in the households. By focusing on only the rural ecological zones, we relaxed the functionality assumption made by parametric models and adopted a non-parametric (NP) model. Unlike the parametric model, the NP model has an advantage of quantifying effects which are nonlinear. The results are qualitatively similar across rural ecological zones. Apart from the rural coastal where there is a weak significant effect, the number of child dependents in a household significantly influences poverty likelihood in both rural forest and

rural savannah (see Table 3). The effect is however nonlinear as demonstrated by the NP model. Thus, the positive effect typically reported between number of child dependents and likelihood of being poor is seen when the number of dependents is at most four in Ghana's case. The reverse is rather seen when the number of child dependents is six or more. The issue of child labour may be linked to this result so that with more younger members in the household, some of them may serve as cheap labour to support households. Meanwhile, we find remittance income to be more important in rural savannah compared to rural coastal. In the case of rural savannah, a yearly receipt of GH¢800 (\$138) or as low as \$12 monthly remittance (an equivalent of \$0.40 daily) is enough to leap a poor household from poverty. Although weakly significant, receiving at least GH¢ 1500 (\$258) yearly reduces the likelihood of being poor in the rural forest. Two things are obvious from this finding. First, rural households (particularly in the savannah zone) remain vulnerable. Second, providing decent living and reducing poverty incidence in rural areas may not require complex policies.

Following our findings, we make two main recommendations: first, given that most households are engaged in subsistence agriculture, introducing rural households to climate-smart agriculture policies may help greatly by mitigating the adverse effect of climate change on their activities; ensure all-year-round production; increase production and income; and subsequently improve living standards. Finally, intensifying family planning education will be a useful policy that may help control "excess" burden households face with having more dependents to cater for. Unfortunately, in the last decade, family planning education has not been as intensive as it used to be in the 1990s and early 2000s. The effect of child dependency and household size is an indication that policies meant to manage fertility and family size may be useful in reducing household's likelihood of being poor.

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References

- Adams, R. (2006). Remittances, Poverty and Investment in Guatemala. *International Migration, Remittances and the Brain Drain* Washington DC: World Bank, pp. 53–80.
- Adams, R. H. and Cuecuecha, A. (2013). The impact of remittances on investment and poverty in Ghana. *World Development*, Vol. 50, pp. 24 – 40.
- Adjasi, C.K.D. and Osei, A.O. (2007). Poverty Profile and Correlates of Poverty in Ghana. *International Journal of Social Economics*, Vol. 34 No. 7, pp.449–471.
- Afriyie, L.T., Saeed, B.I.I., and Alhassan, A. (2019). Determinants of Child Labour practices in Ghana. *Journal of Public Health*, Vol. 27, pp. 211–217.
- Akrofi, M.M., Akanbang, B.A.A. and Abdallah, C.K. (2018). Dimensions of Regional Inequalities in Ghana: assessing disparities in the distribution of basic infrastructure among Northern and Southern districts. *International Journal of Regional Development*, Vol. 5, Issue 1, pp.25–43.
- Aregbeshola, B.S. and Khan, S.M. (2018). Out-of-Pocket Payments, Catastrophic Health Expenditure and Poverty Among Households in Nigeria 2010. *International Journal of Health Policy Management*, Vol. 7, No. 9, pp. 798–806.
- Awan, R.U., Fasahat, W., Shazia, R. and Falak, S. (2017). Impact of remittances on expenditure and Poverty at Household Level in Pakistan. *Pakistan Economic and Social Review*, Vol. 55, No. 2, pp. 415–434.
- Canagarajah, S. and Portner, C.C. (2002). Evolution of Poverty and Welfare in Ghana in the 1990s: achievements and challenges. The World Bank, July, 2002, Washington D.C.
- Chaudhry, I.S. and Rahman, S. (2009). Impact of Gender Inequality in Education on Rural Poverty in Pakistan: an empirical analysis. *European Journal of Economics, Finance and Administrative Sciences*, Issue 15.
- Chaudhry, I.S., Malik, S. and ul Hassan, A. (2009). The Impact of Socioeconomic and Demographic Variables on Poverty: a village study. *The Lahore Journal of Economics*, Vol. 14, Issue 1, pp. 39–68.
- Chukwuone, N., Amaechina, E., Enebeli-Uzor, S. E., Iyoko, E., and Okpukpara, B. (2012). Analysis of Impact of Remittance on Poverty in Nigeria. Partnership for Economic Policy Working Paper.
- Dey, S. (2014). Impact of remittances on poverty at origin: a study on rural households in India using Covariate Balancing Propensity Score Matching. *Migration and Development*, 1-15.
- Engle, P.L. and Black, M.M. (2008). *Annals of the New York Academy of Sciences*, Vol. 1136, pp. 243–256.

- Esquivel, G., and Huerta-Pineda, A. (2007). Remittances and poverty in Mexico: A propensity score matching approach. *Integration and Trade Journal*, Vol. 27, pp. 45–71.
- Filmer, D. and Pritchett, L. (1999). The Effect of Household Wealth on Educational Attainment: Demographic and Health Survey Evidence World Bank Policy Research Working Paper, No. 1980.
- Gang, S., K. Sen and M. Yun. (2002). Caste, ethnicity and poverty in rural India: IZA, Discussion Paper No. 629. Bonn: The Institute for the Study of Labor (IZA), www.iza.org/en/.
- Ghana Statistical Service. (2007). Patterns and Trends of Poverty 1991 – 2006, Ghana Statistical Service (GSS), Accra, Ghana, www.statsghana.gov.gh – accessed on 20th March, 2019.
- Ghana Statistical Service. (2017). Poverty Trends in Ghana, Ghana Statistical Service (GSS), Accra, Ghana, www.statsghana.gov.gh – accessed on 7th January, 2020.
- Ghana Statistical Service. (2019). Ghana Living Standards Survey – main report, Ghana Statistical Service (GSS), Accra, Ghana, www.statsghana.gov.gh – accessed on 7th January, 2020.
- Gupta, I. and Mitra, A. (2004). Economic Growth, Health and Poverty: an exploratory study for India. *Development Policy Review*, Vol. 22, No. 2, pp. 193–206.
- Higgins, K. (2009). Regional Inequality and Secondary Education in Ghana. Overseas Development Institute, Policy Brief No. 1. <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/3375.pdf>. Accessed on January 6, 2021.
- Karymshakov, K., Sulaimanova, B., Sultakeev, K., & Abdieva, R. (2016). Remittances impact on youth labour supply: evidence from Kyrgyzstan (No. 2016-05). PEP-PMMA.
- Kyereme, S.S. and Thorbecke, E. (1991). Factors Affecting Poverty in Ghana, *Journal of Development Economics*, Vol. 28 No.1, pp. 39-52.
- Malik, S. (1996). Determinants of Rural Poverty in Pakistan: a micro study. *The Pakistan Development Review*, Vol. 35, No. 2, pp. 171–187.
- Mchenga, M., Chirwa, G.C. and Chiwaula, L.S. (2017). Impoverishing Effects of Catastrophic Health Expenditures in Malawi. *International Journal for Equity in Health*, Vol. 16, No. 25.
- Meyer, D.F. and Nishimwe-Niyibanira, R. (2016). The Impact of Household size on Poverty: an analysis of various low-income townships in the Northern Free State region, South Africa. *African Population Studies*, Vol., 30, No. 2, pp. 2283–2295.

- Moore, K.A., Redd, Z., Burkhauser, M., Mbwana, K., Collins, A. (2009). Children in Poverty: trends, consequences, and policy options. ChildTrend Research Brief, No. 2009-11. 4301 Connecticut Avenue, NW, Suite 350, Washington, DC. <https://childtrends-ciw49tixgw5lbab.stackpathdns.com/wp-content/uploads/2013/11/2009-11ChildreninPoverty.pdf> Accessed on January 7, 2021.
- Okurut, F.N., Odwee, J.A.O. and Adebua, A. (2002). Determinants of Regional Poverty in Uganda, Research Paper 122, African Economic Research Consortium (AERC) Nairobi.
- Orbeta, A.C. (2005). Poverty, Vulnerability and Family Size: evidence from The Philippines. Asian Development Bank Institute, Discussion Paper No. 29. Tokyo.
- Owusu, V. and Kwarteye, A.G. (2008). An Empirical Analysis on the Determinants of Child Labour in Cocoa Production in Ghana, paper presented at PEGNet Conference, September, 11 – 12, 2008, Accra – Ghana.
- Ranjan, R. (2002). The Determinants of Child Labour and Child Schooling in Ghana, *Journal of African Economics*, Vol. 11 No. 4, pp. 561– 90.
- Sackey, H. A. (2005). Poverty in Ghana from an Assets-based Perspective: an application of probit technique. *African Development Review*, Vol. 17, pp. 41–69.
- Secombe, K. (2000). Families in Poverty in the 1990s: trends, causes, consequences, and lessons learned. *Journal of Marriage and Family*, Vol. 62, No. 4, pp. 1094–1113.
- Sekhampu, T.J. (2013). Determinants of Poverty in a South African Township. *Journal of Social Sciences*, Vol. 34, No. 2, pp.145–153.
- Takyi, E. (2014). Child Labour in Ghana: Ecological Perspective. *Developing Country Studies*, Vol. 4 No. 10, pp. 35–42
- Virola, R.A. and Martinez, A.M. (2007). Population and Poverty Nexus: does family size matter? Paper presented at 10th National Convention on Statistics (NCS), EDSA Shangri-La Hotel, October, 1-2, 2007.
- Yankson, P.W.K. (2015). Intra-Regional Inequalities in Development and Implications for Regional Planning. *Zeitschrift für Wirtschaftsgeographie*, 30(3). <https://www.degruyter.com/view/journals/zfw/30/3/article-p84.xml>. Accessed on January 6, 2021.