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Factors affecting poverty in rural Bangladesh: An analysis using multilevel modelling

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Abstract

Poverty is a multi-faced problem in the developing world and it is much more complex in rural settings. Hence, policy formulation based on national level studies sometimes fails to find remedies of rural poverty. Thus, the present study aims to identify the determinants of poverty in rural Bangladesh using the nationally representative Household Income and Expenditure Survey (HIES) 2010 data. The HIES follows a hierarchical structure hence, two-level random intercept binary logistic regression models were used to capture the unobserved heterogeneity between communities along with revealing important factors associated with poverty. The analyses found that 32% of the households were absolute poor and 19% were extremely poor in rural Bangladesh. The potential factors having significant association with poverty were found to be age and education of household head, division, household size, household types, number of dependents, per capita income, household own land, access to electricity, amount of cultivable land, engagement in livestock and farm forestry, household non-agricultural assets, number of male earner and number of female earner in the family. Significant community-level variations were observed in the analyses which emphasis the need for special attention on the poor performing communities. Specific policy recommendations have been suggested for the poverty alleviation of rural households in Bangladesh.

Introduction

Poverty remains a global concern for the last few decades. It's nature and dimension are much complex in rural areas. Poverty eradication issues were given the highest emphasis in the Millennium Development Goals (MDGs) and subsequently, these have been kept as the priorities in the Sustainable Development Goals (SDGs).Poverty restrains economic growth and sustainable development. The social, economic, demographic, cultural and other significant contributing factors for poverty reduction have implications on the economic development and policy interventions (World Bank, 2014).

Globally, majority of the poor live in rural areas and mainly depend on agriculture. About 76% of the developing world's poor live in rural areas, well above the overall world population share living in rural areas, which is only 58% (Ravallion *et al*., 2007;World Bank, 2014). A study conducted by Thapa (2004) reveals that about 40% of the world's poor live in South Asia, where poverty is mostly a rural crisis. In Pakistan, the incidence of poverty in urban areas is 9.3%whereas in rural areas it is 54.6% (Alkire, 2016).More alarmingly, in a developing country like Bangladesh, the prevalence of poverty is a persistent problem. However, after many successful programme interventions, the incidence of poverty in Bangladesh has decreased to some extent but is still facing a distressing level. According to HIES (2010), the incidence of poverty in national, urban and rural areas were 31.5%, 21.3% and 35.2% respectively.

There exists enormous literatures covering almost every country of the globe that deal with the status and determinants of poverty (for example, Biyase and Zwane, 2017; Akhtar *et al*., 2017; Rhoumah, 2016; Khatun, 2015; Rahman, 2015; Korankye, 2014; Spaho, 2014; Ogwumike and Akinnibosun, 2013; Thapa, 2013; Bogale*et al*., 2005). These studies address core aspects of poverty and revealed different risk factors.

Biyase and Zwane (2017) examined the determinants of poverty and household welfare in the South Africa using random effect probit model and fixed effect model. Their study identified several factors such as education, sex, race, employment and marital status of the household's head as significantly related to the household welfare and poverty. In addition, they reported that the households living in rural areas were more likely to be extremely poor compared to the urban areas. A study on the factors that affect poverty among coastal fishermen community in Malaysia using logistic regression revealed that education, household size and marital status are the major determinants of poverty among fishermen's households (Rhoumah, 2016). A study by Korankye (2014) investigated that poor governance, lack of education and prevalence of diseases were the major causes behind poverty in Ghana. In Bangladesh, a study conducted by Khatun (2015) identified that poverty was caused from lack of income, access to education, credits and public infrastructure. Rahman (2015) examined the factors associated with

income inequality and consumption in rural Bangladesh. The study recommended for adoption of modern agricultural technology, rural infrastructure development to promote economic diversification and non-agricultural income to reduce income inequality and increase consumption of rural households in Bangladesh.

In Bangladesh, there is a significant gap in living standard among people and the people of rural areas suffered the most from the poverty. Moreover, poverty itself has a different face in rural areas. This emphasizes the need for in-depth analysis of the poverty of rural households in Bangladesh. This study aims to identify the determinants of poverty among rural households in Bangladesh using Household Income and Expenditure Survey (HIES) data. The HIES is a multistage cluster survey having hierarchy in the data. Households are nested into the communities and communities are nested into the districts, hence signify the need for the use of multilevel regression modelling (Alom *et al*., 2012; Islam, 2010).Our review suggests that most of the poverty studies used national level data and ignored the possibility of community effect. Recent studies on other related issues used multilevel model to capture the community effect (see for example, Islam, 2010).To the best of our knowledge, no study in Bangladesh dealt with the unobserved heterogeneity of community effect on poverty which might have greater policy impact. This study is likely to fill in the gaps.

Materials and Methods

Data

This study is based the data from Household Income and Expenditure Survey (HIES) 2010 conducted by Bangladesh Bureau of Statistics (BBS). A two-stage stratified random sampling technique was used to ensure greater precision. In the first stage, the specific geographic areas (mouza/ward) were considered as primary sampling units (PSUs) within each stratum. In the second stage, 20 households were randomly selected from each PSU covering rural, urban, and statistical municipal areas. A PSU is usually a natural cluster of households. The HIES data are hierarchical due to its formation where households are nested into PSUs, and PSUs into divisions. In the HIES2010, a total of 12240 households were randomly selected from 7 divisions, 64 districts, and 384 sub-districts. In our study, we have used 7840 rural households in Bangladesh to identify the important factors associated with poverty in rural Bangladesh.

Measures of Poverty

Poverty can be estimated by using a number of approaches. The present study estimates poverty based on Cost of Basic Needs (CBN) method. In CBN method, the poverty line (PL) indicates the average level of per capita expenditure at which persons can meet basic food and non-food needs. However, the upper poverty line (UPL) can be computed as adding the food and upper non-food allowances, while the lower poverty line (LPL) constitutes adding the food and lower non-food allowances (HIES, 2010). In Bangladesh, absolute poverty is defined as the households whose per capita expenditures are below the UPL, whilst hard-core or extreme poverty refers to the households whose per capita expenditures are below the LPL.

Determination of household poverty

The main goal of this study is to examine the factors related to the response variables (e.g., absolute poor and extreme or hard-core poor). In our study the dependent variables are dichotomous. The categories areas follows: (i) 1 = household is poor if household per capita consumption expenditure is less than UPL; 0 = otherwise (reference category) (ii) 1 = household is extreme poor if household per capita consumption expenditure is less than LPL; 0 = otherwise (reference category). The primary preference of explanatory variables for this study was based on previous other studies on the factors influencing household poverty. The independent variables used in the study are division, age of household's head (years), age squared of household's head, household size, household size squared, sex of household's head, household type, household head's education, number of dependents, per capita income(BDT), household own land (decimals),access to electricity, amount of cultivable land (decimals), household engaged in livestock, household engaged in farm forestry, household's non-agricultural assets, number of male earner and number of female earner.

Two-level random intercept binary logistic regression model

It is very likely that the cluster or community (PSU) effect on the response variable will be present when there is a hierarchical data structure in the survey, for example, HIES 2010. The traditional logistic regression ignoring such cluster effect is inappropriate as the standard errors of regression coefficients are under estimated leading to the significance of a regression coefficient that could be ascribed to likelihood. This may instigate wrong policy formulation (for example, see Khatun *et al*., 2012).In this context, to overcome this problem a multilevel logistic regression model containing both fixed effects and random effects that attempts to capture the unobserved heterogeneity between clusters is commonly used (Pinheiro and Bates, 2000; Goldstein, 2003; Demidenko, 2004). The use of appropriate multilevel model provides efficient estimates and the policies devised on the basis of these are reliable. In addition, the significance and extent of the community effect help to find if there is any community that is performing poorly.

In the general case, the two-level random intercept binary logistic regression model is the expansion of the single-level binary logistic regression model (for details,

Goldstein, 2003). Let a binary response variable Y_{ij} be 'household poverty status' (= 1if household *i* in community *j* is poor, 0 otherwise). The two-level random intercept binary logistic regression model considering household at level-1 and communities (PSU) at level-2 can be written as follows:

$$\text{logit}(\pi_{ij}) = \log(\frac{\pi_{ij}}{1-\pi_{ij}}) = \beta_{0j} + \sum_{k=1}^{m} \beta_k X_{ijk};$$

$$i = 1,2,\ldots,n_j, j = 1,2,\ldots,d$$

with $\beta_{0j} = \beta_0 + u_{oj}; \quad u_{0j} \sim iidN(0, \sigma_{u0}^2),$

where $\pi_{ij} = \Pr(Y_{ij} = 1)$ is the probability that the household *i* in community *j* is poor, X_{ijk} is the k^{th} explanatory variable(*k= 1,2,3,…,m*) for household i in community j and β_k is the k^{th} regression coefficient to be estimated. Also, β_0 is a fixed component and the random cluster-specific effect u_{0j} is assumed to be independently and identically normally distributed. To capture the unobserved variation not explained by the explanatory variables, the random cluster-specific (PSU) effects are taken. The rejection of the null hypothesis $H_0 : \sigma_{u0}^2 = 0,$ indicates that there is a significant community effect in the model, meaning that the extent of poverty will not be the same for the household from different community with the same set of characteristics. Moreover, assuming different values for u_{oj}, the effects of the community-specific component on the response variable can be explored in relation to other explanatory variables due to the additive nature of the model.

The two-level random intercept binary logistic regression model is fitted using Stata14.0 software considering only the independent variables found significant in the bi-variate analyses and variables found significant at this stage are kept in the final models. The possibility of multicollinearity and confounding has been explored too. The possible interaction effects were tested and are reported where found.

Results and Discussion

The incidence of poverty among rural households in Bangladesh assessed by upper poverty line (UPL) and lower poverty line (LPL) is shown in Figure 1. The study found that about 32% households were absolute poor and 19% were extremely poor.

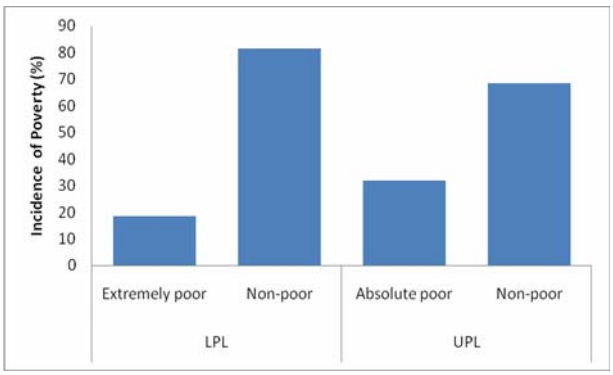

Fig. 1. Incidence of poverty among the rural households in Bangladesh

Determinants of extremely poverty (LPL)

Table 1 represents the significant determinants of poverty based on lower poverty line (LPL) in rural Bangladesh. The data analysis suggests that households from Chittagong, Rajshahi and Sylhet divisions were significantly less likely to be extremely poor compared to the households from Rangpur division. The odds ratios were 0.27, 0.58 and 0.45 for Chittagong, Rajshahi and Sylhet divisions respectively. Similar was observed by Rahman *et al*. (2012). Rangpur being a monga prone division is severely affected by poverty, especially in its rural areas (Khandker *et al*., 2009).

With the increase in household head's age, the likelihood of being extremely poor seems to decrease. The obvious reason is that asset ownership tends to increase with age. Our findings are consistent with the results of Bogale *et al*. (2005). The results reveal that households with larger number of members were more likely to be extremely poor (OR = 2.02) than their counterparts. One possible explanation may be that with the increase in the family size, the per capita consumption of food tends to decrease. This conforms to the findings by Bogale *et al*. (2005) in rural Ethiopia. Other studies corroborate with such result too (Bogale*etal.*, 2005; Herrera, 1999; Afera, 2015; Haddad and Ahmed, 2003; Woolard and Klasen, 2005).

When the household is living in Kacha house and Jhupri it is more likely to be extremely poor compared to household living in Pacca and Semi Pacca house. For example, the likelihood of household living in Jhupri to be extremely poor is 3.52 times more compared to the reference category. World Bank (2014) also reported the same. Education of the household head seems to have significant positive impact on poverty in rural Bangladesh. Households head having education of level VI and above were 0.54 times less likely to be extremely poor compared to the household head having no education. Our result conforms to the findings by other studies, such as Bogale *et al*. (2005); Bigsten *et al*. (2003) and Widyanti *et al*. (2009).

Table 1. Two-level random intercept binary logistic regression estimates of the effect of different socio-economic and demographic characteristics on Poverty (Lower poverty line) in rural Bangladesh

Independent variables	$\hat{\beta}$	SE	OR	95% CI of OR	
				LCL	UCL
Division					
Ref. : Rangpur					
Barishal	−0.16	0.28	0.85	0.49	1.47
Chittagong	–1.31***	0.25	0.27	0.16	0.44
Dhaka	–0.17	0.22	0.84	0.54	1.31
Khulna	–0.41	0.26	0.66	0.40	1.10
Rajshahi	–0.54**	0.26	0.58	0.35	0.97
Sylhet	–0.79***	0.29	0.45	0.26	0.80
H Age	–0.06***	0.02	0.94	0.91	0.97
SQH Age	0.00***	0.00	1.00	1.00	1.00
HH Size	0.70***	0.09	2.02	1.71	2.40
SQHH Size	–0.04***	0.01	0.96	0.95	0.97
Sex ratio	0.01	0.04	1.01	0.93	1.09
HH Sex					
Ref. : Female					
Male	–0.14	0.13	0.87	0.67	1.12
HH Type					
Ref. : Pacca semi pacca					
Kacha	0.97***	0.19	2.65	1.84	3.81
Jhupri	1.26***	0.22	3.52	2.31	5.39
HH Edu					
Ref. : No education					
Class I – V	–0.41***	0.11	0.66	0.53	0.83
Class VI and above	–0.61***	0.12	0.54	0.43	0.68
N Dependents	0.37***	0.05	1.45	1.31	1.61
Pin come					
Ref. : (0–1000 Tk.)					
(1000 – 2000 Tk.)	–0.68***	0.09	0.51	0.43	0.60
(2000 – 3000 Tk.)	–1.44***	0.14	0.24	0.18	0.31
(3000 and above)	–2.39***	0.24	0.09	0.06	0.15
Own Land					
Ref. : (< 50) decimals					
(50 – 100)	–0.37***	0.14	0.69	0.53	0.90
(100 – 200)	–0.88***	0.16	0.42	0.30	0.57
(200 and above)	–1.45***	0.23	0.23	0.15	0.37
Electricity					
Ref. : No					
Yes	–0.96***	0.10	0.38	0.32	0.47
Cul Crop					
Ref. : No					
Yes	–0.59***	0.09	0.56	0.46	0.67
Livestocks					
Ref. : No					
Yes	–0.49***	0.10	0.62	0.51	0.74
F forestry					
Ref. : No					
Yes	–0.22**	0.10	0.80	0.66	0.97
Other Assets					
Ref. : No					
Yes	–0.85***	0.10	0.43	0.35	0.52
M Earner	0.18**	0.08	1.20	1.02	1.40
F Earner	0.50***	0.11	1.66	1.34	2.05
Constant	–1.59***	0.47			
Random-effects (SD): PSU	1.002***	0.07		0.88	1.14
Log likelihood	–2551.20				

Note: SE, CI, OR, LCL, UCL and SD denote standard error, confidence interval, Odds ratio, lower CI, upper CI and Standard Deviation respectively. *p < 0.10; **p < 0.05; ***p < 0.01.

An increase in the number of dependent members, significantly increase the likelihood of being extremely poor (OR = 1.45).Household per capita income seems to have significant positive impact on poverty in rural Bangladesh. Households having per capita income BDT 3000 and above were 0.09 times less likely to be extremely poor compared to household having per capita income BDT 1000 or less. Similar result was observed by Khatun (2015).The likelihood of extreme poverty decreases with the increase of amount of land owned by the household. For instance, households having land of size 200 decimals and above were 0.23 times less likely to be extremely poor than the household having land of size less than 50 decimals. Finan *et al*. (2005) revealed the same in rural Mexico.

The availability of electricity facilities is more likely to be effective in decreasing the incidence of poverty among the households in rural Bangladesh. The results indicated that the households with electricity access were 0.38 times less likely to be extremely poor than their counterparts. The fact is that electricity connection opens the door to a wide range of activities through its direct and indirect linkages to earning and the involvement in high return sectors always ensuring the well-being. This result is consistent with the findings of Khandker *et al*. (2009) conducted in Bangladesh. The household's engaged in cultivated crops were 0.58 times less likely to be extremely poor than their counterparts. Likewise, households involving in forestry and livestock were less likely to have extreme poverty. The odds ratios were 0.62 and 0.80 for livestock and farm forestry respectively. Similar result was reported by Kiyingi *et al*. (2016) in Uganda for farm forestry and by Millar *et al*. (2008) in Lao PDR for livestock. Surprisingly, with the increase in number of male and female earners, the likelihood of being extremely poor seems to increase. This may be due to the fact that in the rural Bangladeshi context more earners should be engaged to survive as the income level is generally low and of seasonal type. Note that the presence of multicolinearity was investigated and the results show ignorable effects. Similar was observed by Rahman *et al*. (2012).

Significant community effect (SD = 1.002) was observed in the model, meaning that people from different communities having similar characteristics will exhibit different incidence of extreme poverty. Moreover, the additive nature of the model indicates that effects of individual communities may sometimes be greater than the effects of the factors considered in the model. For example, a one standard(SD=1.002) deviation change in the community random effect has a higher influence on extreme poverty than the people from Rajshahi and Sylhet division $(\hat{\beta} = -0.54; \hat{\beta} = -0.79)$, Age of household's head $(\hat{\beta} = -0.06)$, household size $(\hat{\beta} = 0.70)$, education level of household's head Class I-V, Class VI and above $(\hat{\beta} = -0.41; \hat{\beta} = -0.61)$, household engaged in livestock farming $(\hat{\beta} = -0.49)$. In this context, policy planners can achieve more to improve extreme poverty among the people of that community by focusing on the community-specific characteristics (e.g. education, profession, etc.).

Determinants of absolute poverty (UPL)

The findings of the two-level logistic regression model for absolute poverty based on UPL indicate that people from Barishal, Chittagong, Rajshai and Sylhet division were respectively0.59, 0.31,0.53 and 0.22 times less likely to be absolute poor compared to the people from Rangpur division (Table 2). There has been no similar study to compare the results except HIES 2010whichfound highest incidence of absolute poverty in Rangpur division.

The likelihood to be absolute poor decreases, with the increase in household head's age (OR = 0.94).Similar pattern was observed by Rahman *et al*. (2012) in rural Bangladesh using HIES 2005. With the increase in household size, the likelihood of being absolute poverty seems to increase (OR = 1.96).This seems true in other country settings too. For example, studies by Meyer and Nishimwe-Niyimbanira (2016) in South Africa and Bogale *et al*. (2005) in Ethiopia reported the same. When the household is living in Kacha house and Jhupri it is more likely to be absolute poor compared to household living in Pacca and Semi Pacca house. For example, the livelihood of household living in Kacha is 2.12 times more likely to be absolute poor compared to the reference category. World Bank (2014) also reported the same.

Education of the household head seems to have significant positive impact on poverty in rural Bangladesh. Household's head having class VI and above education were 0.50 times less likely to be absolute poor compared to household's head having no education. Our result conforms to the findings by other studies, such as Bogale *et al*. (2005); Bigsten *et al*. (2003) and Widyanti *et al*. (2009).The likelihood of being absolute poor significantly increase with an increase in the number of dependent members, (OR = 1.53).Rahman *et al*., (2012) reported the same using HIES 2005.Household per capita income seems to have significant negative impact on absolute poverty in rural Bangladesh. Households having per capita income BDT3000 and above were 0.10 times less likely to be absolute poor compared to household having per capita income BDT1000 or less. Our result conforms to the findings of Khatun (2015).The likelihood of absolute poverty decreases with the increase of household's own land. For instance, households having 200 decimals and above own land were 0.27 times less likely to be absolute poor than the household having less than 50 decimals own land. Finan *et al*. (2005) found similar result in rural Mexico.

Table 2. Two-level random intercept binary logistic regression estimates of the effect of different socio-economic and demographic characteristics on Poverty (Upper poverty line) in rural Bangladesh

Independent variables	($\hat{\beta}$)	SE	OR	95% CI of OR	
				LCL	UCL
Division					
Ref. : Rangpur					
Barishal	–0.52*	0.27	0.59	0.35	1.01
Chittagong	–1.16***	0.24	0.31	0.20	0.50
Dhaka	–0.22	0.22	0.81	0.53	1.23
Khulna	–0.34	0.25	0.71	0.44	1.15
Rajshahi	–0.64**	0.25	0.53	0.32	0.86
Sylhet	–1.51***	0.28	0.22	0.13	0.38
H Age	–0.06***	0.01	0.94	0.91	0.97
SQH Age	0.00***	0.00	1.00	1.00	1.00
HH Size	0.68***	0.07	1.96	1.70	2.27
SQHH Size	–0.04***	0.01	0.96	0.95	0.97
Sex ratio	–0.05	0.04	0.95	0.89	1.02
HH Sex					
Ref. : Female					
Male	–0.11	0.11	0.90	0.72	1.12
HH Type					
Ref. : Pacca semi pacca					
Kacha	0.75***	0.13	2.12	1.63	2.76
Jhupri	1.24***	0.17	3.44	2.47	4.79
HH Edu					
Ref. : No education					
Class I – V	–0.30***	0.09	0.74	0.61	0.89
Class VI and above	–0.69***	0.10	0.50	0.42	0.61
N Dependents	0.42***	0.05	1.53	1.40	1.67
Pin come					
Ref. : (0–1000 Tk.)					
(1000 – 2000 Tk.)	–0.69***	0.08	0.50	0.43	0.59
(2000 – 3000 Tk.)	–1.35**	0.11	0.26	0.21	0.32
(3000 and above)	–2.30***	0.16	0.10	0.07	0.14
Own Land					
Ref. : (< 50) decimals					
(50 – 100)	–0.47***	0.11	0.63	0.50	0.78
(100 – 200)	–0.99***	0.13	0.37	0.29	0.48
(200 and above)	–1.30***	0.16	0.27	0.20	0.37
Electricity					
Ref. : No					
Yes	–0.82***	0.08	0.44	0.37	0.52
CulCrop					
Ref. : No					
Yes	–0.47***	0.08	0.62	0.53	0.73
Livestocks					
Ref. : No					
Yes	–0.39***	0.09	0.67	0.57	0.80
F forestry					
Ref. : No					
Yes	–0.19**	0.08	0.82	0.70	0.97
Other Assets					
Ref. : No					
Yes	–0.64***	0.08	0.53	0.45	0.62
M Earner	0.36***	0.07	1.43	1.25	1.65
F Earner	0.42***	0.10	1.52	1.26	1.85
Constant	–0.27	0.41			
Random-effects (SD): PSU	1.02***	0.06		0.91	1.14
Log likelihood	–3296.31				

Note: SE, CI, OR, LCL, UCL and SD denote standard error, confidence interval, Odds ratio, lower CI, upper CI and Standard Deviation respectively. *p < 0.10; **p < 0.05; ***p < 0.01.

The availability of electricity facilities is more likely to be effective in decreasing the incidence of poverty among the households in rural Bangladesh. The results indicated that the households with electricity access were 0.44 times less likely to be absolute poor than their counterparts. This result is consistent with the findings of Khandker *et al*. (2005).The household's engaged in cultivated crops were 0.62 times less likely to be absolute poor than their counterparts. Likewise, households involving in forestry and livestock were less likely to have absolute poverty. The odds ratios were 0.67 and 0.82 for livestock and farm forestry respectively. Similar finding was reported by Kiyingi *et al*. (2016) in Uganda for farm forestry and by Millar *et al*. (2008) in Lao PDR for livestock. As found for extreme poverty, model for absolute poverty suggests that with the increase in number of male and female earners, the likelihood of being absolute poor seems to increase. The explanation being the same as mentioned earlier. Also, no multicolinearity was detected in the analysis.

Significant community effect (SD = 1.02) was observed in the model. As explained earlier (for LPL) a one standard deviation change in the community random effect has a higher influence on absolute poverty than the people from Rajshahi and Barisal division $(\hat{\beta} = -0.64; \hat{\beta} = -0.52)$, Age of household's head $(\hat{\beta} = -0.06)$, household size $(\hat{\beta} = 0.68)$, education level of household's head Class I-V, Class VI and above $(\hat{\beta} = -0.30; \hat{\beta} = -0.69)$, household engaged in livestock farming $(\hat{\beta} = -0.39)$. These suggest that addressing some of the poor performing communities may result faster achievement in alleviating absolute poverty than investing in some specific policy variables(for example, education of the household head).

Conclusion and policy implications

This study investigated the determinants of poverty among rural households in Bangladesh using a nationally representative HIES 2010 dataset. The cost of basic need (CBN), a widely used measure of poverty, using two poverty lines, namely lower poverty line (LPL) and upper poverty line (UPL) were utilized to assess the incidence of poverty among rural households. The analyses revealed that among households from rural areas, the incidence of absolute and extreme poverty were32% and 19% respectively, which are above the prevalence at urban level. These indicate that the people from rural areas are suffering the most from poverty and require immediate policy intervention.

This study identified several risk factors that were associated with household's poverty using two-level random intercept binary logistic regression model. In the context of rural Bangladesh, this is the first study which used such relatively innovative approach and is an additional contribution of this paper. The significant determinants of extreme poverty and absolute poverty identified in this study would guide the policy planners to devise important and effective remedial measures. Also, it appears from the study that different interventions are required for different measures of poverty (extreme and absolute). Significant community effects were found in the models for both the measures of poverty. This research recommends that additional specific intervention, besides the national level intervention, be offered for different communities to overcome the problem of poverty. The study also argued that sometimes more can be achieved by addressing only the community level variations.

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