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Title

Effects of Non-farm Employments on Poverty among Small Households in Developed Villages of Bangladesh: A Case of Comilla Sadar *Upazila*

Authors

Mohammad Abdul Malek

The United Graduate School of Agricultural Sciences, Tottori University, Japan. C/O Prof. Koichi USAMI, Faculty of Agriculture, Yamaguchi University, 1677-01 Yoshida, Yamaguchi 753-8515, Japan. Email:

malekr25@gmail.com

And

Koichi Usami, PhD

Professor, Faculty of Agriculture, Yamaguchi University, 1677-01 Yoshida, Yamaguchi 753-8515, Japan. Email: usami329@yamaguchi-u.ac.jp

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Abstract

The study aims at estimating comprehensive effects of non-farm employments (NFEs) on poverty based on an intensive field survey conducted in 2008 on about 175 small landholding households in developed four villages of Comilla Sadar *Upazila*. We analyze participating factors of small household workers in NFEs and their effects on household production (farming and non-farm activities) and consumption (both food and non-food). For estimating consumption effects (poverty), we focus on food adequacy, income poverty and education poverty (as a part of human poverty). At each level of estimation, we depend on appropriate econometric regressions. Results find the significant positive role of overall NFEs on household NFAs rather farming. Remittance incomes do not contribute in household production either farming or non-farm activities and food adequacy; and thus, these must be spent on non-food consumption. Education-poverty levels are worse than income poverty levels among small households. The increasing NFI is reducing some income poverty, but it is yet to realize in achieving household education; however, access to formal sector employments by the small household workers is significantly reducing education poverty. Therefore, qualitative diversification of the poor household workers and productive use of household remittance incomes deserve special attention.

Keywords: Non-farm employments, household economy, production, consumption, income poverty, education poverty, Bangladesh

JEL codes: J43, O15, Q12, Q17, R15

1. INTRODUCTION

In Bangladesh, due to limited scope of employments in farming and urban manufacturing sector, the livelihood diversification in rural areas has become one of the major challenges. The Government of Bangladesh has already identified the non-farm sector (NFS) as a “leading sector” in the rural economy. But in practice the NFS is not getting due attention like the farm sector, despite such neglect may be socially costly (Hazell and Haggblade, 1993). The NFS expands quite rapidly in response to the farm sector development (Arif, et al., 2000) and therefore merits special attention in designing poverty reduction strategy. It is envisaged that the non-farm employments (NFEs) have significant impacts on household production (farming and non-farming) and consumption (food and non-food) since the NFS develops. The latter effects (consumption) are realized in reducing poverty (for example, food adequacy, income poverty and human poverty). But the empirical evidence in estimating such comprehensive effects is greatly scares.

The poverty/non-farm literatures till to date documented income poverty effects only. In rural Bangladesh context, the studies conducted so far shed light on the importance of NFS in income poverty reduction (Nargis and Hossain, 2006; Hossain, 2005). In other developing countries` contexts, numerous similar studies were conducted. However, only Ruben and Den Berg (2001) estimated the effects of NFEs on farm production and food consumption. But neither study contributed to estimate the comprehensive effects of NFEs as mentioned earlier.

To fill-up such knowledge gaps, this case study, therefore, aims at investigating following issues:

1. What are the participating factors for NFEs among poor household workers?
2. How do the NFEs affect household farming and non-farming?
3. Do the NFEs really affect household food adequacy? Do the NFEs affect income poverty only? Do the NFEs affect human poverty also?

Since a structural shift from farming to non-farm activities (NFAs) is already observed in the rural economy (Nargis and Hossain, 2006), we conduct this study in relatively developed rural locality (Comilla Sadar *Upazila*) where the NFAs are relatively diversified. The sample for investigations includes about relatively small 175 households (owning <2.50 acres of land), among which poverty usually persists, based on a field survey conducted in April-May 2008.

2. CONCEPTUAL FRAMEWORK AND ANALYTICAL METHODS

In a typical developing rural setting, being influenced by individual, household and community factors household workers participate in diverse economic activities, gain increase in income especially from NFAs and spend in household economy (Malek and Usami, 2009). Such a simple framework (Fig: 1) is used for our analyses.

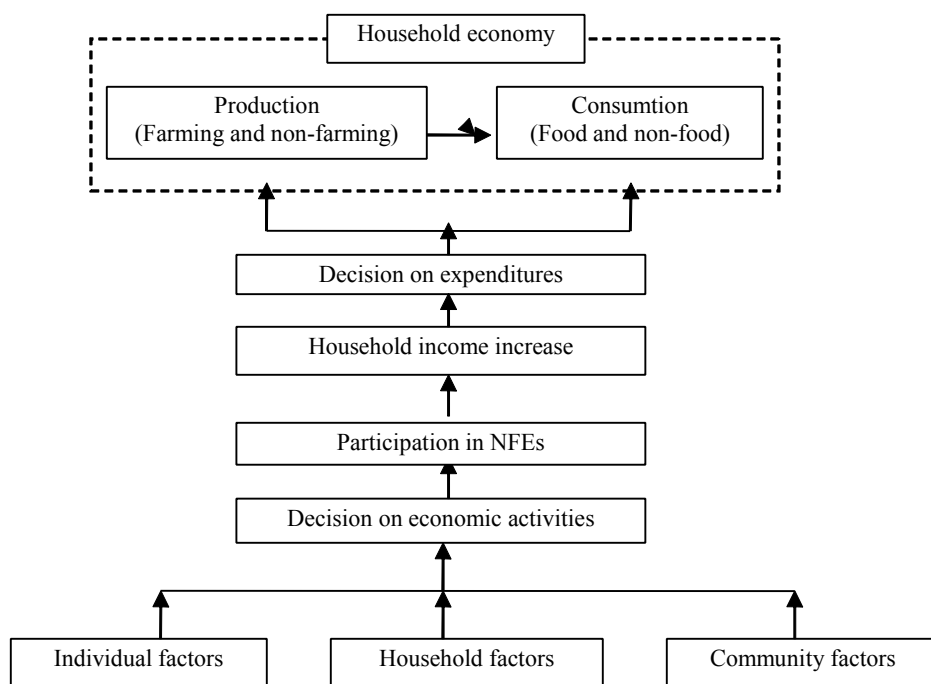


Fig: 1 Household workers behaviour in production and consumption in a developing rural setting

2.1 Household workers participation in NFEs

In a surplus labor situation of rural Bangladesh, for livelihood diversification the household workers (especially the poor) participate in NFEs. They participate in local NFEs (farm wage employments, non-farm self-employments and non-farm wage employments) and remittance (in-country and out-country) employments. Under the rural household economic model, we focus on understanding factors determining household workers participation and their extent of participation.

2.2 Household Production

Due to participation in NFEs, the households gain increase in non-farm income (NFI). Then, the NFI can be invested to buy farm inputs that increase yields (such as fertilizer, pesticides, HYV seeds, etc.) or replace/reduce labor in household farming (such as mechanical ploughing/herbicides). Similarly, the NFI can be invested in household NFAs, especially household non-farm enterprises (HNFEs). Thus, household farming is intensified and NFAs are enlarged.

2.3 Household Consumption: Poverty

As it is already hypothesized that the NFI contributes to achieve consumption both in food and non-food requirements, for this study, we focus on three aspects of poverty- calorie adequacy, income poverty and human poverty.

2.3.1 Calorie adequacy

Calorie adequacy is a major determinant of health and it varies over households (Ruben and Berg, 2001). We calculate calorie intake adequacy ratio by dividing household calorie intake by household requirements for a day. The result is an index of food adequacy that should be higher than one to guarantee food consumption.

2.3.2 Income poverty

The deficiency in income to satisfy basic needs is by far the most widely used definition of income poverty status. Income poverty is determined by a comparison of household income to an absolute poverty line set at the expenditure level for a balanced minimum diet of 2,112 calories with a 30% (of income poverty level income) allowance for non-food basic items per member per day (Nargis and Hossain, 2006). In our study, we do not estimate income poverty line rather use regional (Chittagong Division Rural) income poverty lines updated for 2007 for the case study villages (BBS, 2007).

We use Foster-Greer-Thorbeck (FGT) poverty index (hereinafter income poverty index) to estimate incidence, depth and severity of income poverty among all households (Foster, et al., 1984).

$$IP_{\alpha} = 1 / n \sum_{i=1}^m [z - y_i / z]^{\alpha}, i = 1, 2, \dots, m$$

Where y_i is per capita income of the household i , n is total households, q is number of income poor households, z is income poverty line, and α is degree of aversion to income inequality among the poor. We consider three versions of income poverty index to shed light on different aspects of income poverty:

(i) When $\alpha = 0$, $IP_0 = q / n$ is income poor head-count ratio showing the percentage of households that fail to meet basic food and nonfood requirements of household members. It measures the incidence of income poverty.

(ii) When $\alpha = 1$, $IP_1 = 1 / n \sum_{i=1}^m [z - y_i / z]$ is income poverty gap ratio by averaging the distance of per capita income of the poor from the income poverty line income as a percentage of the income poverty line income over all households. It measures the depth of income poverty.

(iii) When $\alpha = 2$, $IP_2 = 1 / n \sum_{i=1}^m [z - y_i / z]^2$ is squared income poverty gap ratio giving greater weight to the income shortfall, the greater the distance of income from the income poverty line. It measures the severity of income poverty.

2.3.3 Human poverty

Human poverty measures deprivations in three basic dimensions of human development: longevity (life expectancy at birth), knowledge/education (adult literacy) and decent standard of living (access to improved water source and percentage of children under weight for age) (UNDP, 2008). Since there are some limitations in estimating complete human poverty index for small samples, we focus on estimating education poverty indices¹ based on the idea of FGT income poverty indices. The argument is that the NFEs can be best realized in improving household members' education and this reality can be explored by estimating the effects of NFEs on education poverty (education poverty status/incidence, gap and severity). In our study, education poverty is determined by a comparison of per capita education to an education poverty line set at the universal primary level of education (five years schooling).

2.4 Analytical Methods

At each level of estimation, we depend on appropriate econometric methods. For understanding participating factors of small household workers, we implement a version of double hurdle econometric method (Probit and Censored Tobit regression) for participation and their extent of participation (income gained from NFEs) in overall and sector-wise, respectively. Then, we explore the effects of NFEs on household farming with Tobit and OLS regressions where cash value of external inputs at household farming is regressed. Tobit regression considers the complete sample (part-time farm and purely nonfarm households) into account (since purely non-farm households do not incur cost for farm inputs), while OLS takes the part-time farm households only into the sample. Besides, the non-farm production effect is explored with both Tobit and OLS estimations where working capital at HNFEs is regressed. To analyse food adequacy effects, we use 2SLS method where calorie intake adequacy ratio is regressed. Finally, for analysing poverty status (both income poverty and education poverty) we use Probit regression, while for poverty gap and severity of poverty we use OLS regression. Participatin aspects are analysed in terms of individual, household and community factors, while the effects of NFEs are analysed in terms of household and community factors. Though we cover a set of relevant exogenous variables in the regressions (Appendix 1), for interpreting results on the effects of NFEs we particularly focus on household income diversification, strength to the non-farm labor market (SNFLM) and income variables (overall and sector-wise).

¹ $EP_{\beta} = 1 / n \sum_{i=1}^O [p - q_i / p]^{\beta}$, $i = 1, 2, \dots, O$ Where q_i is per capita education of the household i , n is the total sample households, O is the number of education poor households, p is the household education poverty line, and β is the degree of aversion to education inequality among the poor. Similarly, When $\beta = 0$, $EP_0 = O / n$ is the education-poor head-count ratio; When $\beta = 1$, $EP_1 = 1 / n \sum_{i=1}^n [p - q_i / p]$ is the education poverty gap ratio; and When $\beta = 2$,

$EP_2 = 1 / n \sum_{i=1}^n [p - q_i / p]^2$ is the squared education poverty gap ratio or severity of education poverty.

3. STUDY AREA AND THE DATA

Though Comilla Sadar has been purposively selected for the study, it represents well the relatively developed rural locality of Bangladesh (Table 1). Comilla Sadar is an *Upazila* (sub-district) of Comilla District in the Division of Chittagong, Bangladesh located 100 km southwest of the capital city (Dhaka) and adjacent to Tripura of Eastern India. It is connected by national highway and national railway with the capital city and the port city (Chittagong). Based on the *focus group discussion* with the *key informants*, four villages from two *Unions* of Comilla Sadar *Upazila* (excluding urban location *Pouroshova* at *Upazia* head quarters) are selected randomly so that the case study villages are well represented. The villages are within the 15 km reach by usual modes of transport from Comilla district head quarters. Apart from full-time farm households, the extent of non-farm households (part-time farm and purely non-farm households) is remarkably high (about 91%). We selected 214 non-farm households (about 19% of the population) at random proportionately from all strata according to landholding (large, medium, small and marginal, and landless). Then, a survey was conducted among the selected households during August-September 2006 to collect detail data on participation, time allocation and income earned by their all workers (N=442) participating in economic activities for the year 2005-06. We took interview of best informed household members for all relevant data based on a structured questionnaire. Literacy rate is about 80% for the selected households, while the case study villages' average is 75% and national average is 53%. Farming is relatively mechanized, and plenty of rice and vegetables are cultivated. Field survey 2006 shows that compared to participation (66%), more labor time (about 93%) is allocated to NFAs and more income shares (87%) are gained as well (Table 2). That means, the relative returns from NFAs are higher compared to their own farming. We also find that income poverty exists only in relatively small households (188 households) among the selected households. This result is consistent with some other findings (Rahman and Islam, 2003; Sundaram and Tendulkar, 2002). That is the reason; we motivate to analyze the effects of NFEs on poverty among small households.

Accordingly, we conducted another detail survey in April-May 2008 for the year 2007 to get detail data on household workers' participation and income gained from all economic activities, production inputs/return in farming and capitals/sales in HNFEs, household consumption, household members' education, etc. After the survey ends, we find that about 13 households are not acceptable for the analyses, and thus the analyses are done based on the 175 households.

Table 1
Basic characteristics of Comilla Sadar *Upazila*, 2005

Item	Characteristics
1) Location	Comilla district in the Division of Chittagong. About 100 km southwest of the capital city Dhaka.
2) Literacy level	75%
3) Level of dependency on farming	Full-time farm households (10%), part-time farm households (70%), full-time non-farm households (20%).
4) Modes of transport	Connected by national highway and national railway with Dhaka and Chittagong.
5) Rural markets/ Growth centers	About 30 rural markets and 7 growth centers.
6) Major trade and commerce	Farm input business, farm products trade and agro-processing, transport and construction business, restaurants, handicrafts and cottage industries, grocery, etc.
7) Others	Being assigned "Export Processing Zone (EPZ)" at Comilla.

Source: Focus group discussion with key informants (2006)

Table 2

Participation, time allocation and income share of all landholding household workers by economic activities in Comilla Sadar Upazila 2005-06 (N=442)

Activities	Participation (%)	Time allocation (%)	Income share (%)
Own farming	34.4	6.5	12.8
NFAs as a whole	65.7	93.4	87.4
Farm wage employments	8.6	12.8	5.1
Non-farm self-employments	20.8	18.8	27.7
Non-farm wage employments	20.2	18.1	20.3
In-country remittance employments	4.2	20.0	5.7
Out-country remittance employments	11.9	23.7	20.1
Others (rental income, pensions, interest, gifts, etc..)	..	..	8.5
Total	100.0	100.0	100.0

Source: Field survey (2006)

4. RESULTS AND DISCUSSION

4.1 Participation of small household workers in NFEs

4.1.1 Nature of NFEs: participation and income shares

Like for all landholding households, the relative higher returns from NFAs compared to their own farming is evident for small landholding household workers (Table 3). Of the household incomes, the out-country remittance employments show the highest share and return, followed by non-farm self-employments. Among the local NFAs, the non-farm self-employments show the highest share and return. Apart from local NFAs, about 20% household workers participate in remittance employments. The out-country remittance employments are much stronger than the in-country remittance employments both in terms of share and return. Compared to male, female participation is extremely lower (12%) in NFAs.

4.1.2 Determinants of participation and level of participation in overall NFEs

Table 4 presents Probit and Censored Tobit regression results for individual participation explaining probability (in dichotomous nature) of participation and intensity of participation explaining total yearly (2007) income measuring how much income an individual gained from all

Table 3

Participation and income share of small landholding household workers by economic activities in Comilla Sadar Upazila 2007(N=377)

Activities	Participation (%)	Income share (%)	Income share/ participation ratio
Own farming	33.0	12.3	0.37
NFAs as a whole	67.0	87.8	1.31
Farm wage employments	5.4	2.5	0.46
Non-farm self-employments	18.1	29.2	1.61
Non-farm wage employments	23.4	18.0	0.77
In-country remittance employments	4.2	4.3	1.02
Out-country remittance employments	16.0	33.8	2.11
Total	100.0	100.0	

Source: Filed survey (2008)

Table4

Determinants of individual participation and level of participation in overall NFEs among small household workers in Comilla Sadar *Upazila* in 2007: Probit and Censored Tobit estimates (N=377)

Exogenous variables	Participation	Level of participation
I_gen	1.553***(.309)	60178.92***(11689.5)
I_age	.1575(.624)	56251.68***(19229.27)
I_age2	-.758(.607)	-67344.26***(19770.99)
I_edu	-.749(.511)	16864.39*(9095.27)
I_edu2	1.653**(.719)	3078.94(7764.44)
I_insc	1.419***(.373)	5586.08(3891.13)
divsn	.027(.247)	-19188.29***(7466.60)
owhrnfe	.367(.290)	34976.27***(7954.42)
owfors	1.284**(.617)	26775.35***(10743.65)
owincrm	.239(.453)	29255.05***(13250.48)
owoutcre	-.686**(.342)	18064.28*(9832.62)
HH_size	-.017(.175)	-5359.76(5751.48)
femadult	-.025(.220)	8301.28(6167.97)
child_fem	-.013(.190)	4357.31(5360.1)
depwkrs	.274(.183)	1562.08(3627.32)
hpc_edu	-.207(.561)	-11818.68(14653.85)
hpc_edu2	-.094(.564)	531.80(13904.56)
landhold	.059(.148)	14305.28*** (4569.36)
acc_org	-.689**(.331)	15865.85*(9062.29)
Acc_credit	.198(.363)	-8743.68(9505.44)
Acc_ta	1.032**(.472)	9664.95(11380.25)
Acc_frn	.068(.370)	-2660.32(11178.22)
Growth_c	.657** (.286)	20560.47***(9154.19)
Constant	.023(.512)	-50666.48(17683.64)
LR Chi ² (23)	155.41	141.31
Prob> chi ²	0.0000	0.0000
Left censored	..	61
obs at <=0		

Source: Field survey (2008)

Notes: 1) Numbers in parenthesis are standard errors; 2) Statistical significance: *** at 1%, **at 5%, * at 10% levels, respectively; and 3) Variables are standardized

NFEs, respectively for all small households. Results show that both Probit and censored Tobit regressions are statistically significant as a whole. Based on the variable coefficients, following observations can be highlighted. Among individual characteristics, results find a significant gender (male) bias in both participation in overall NFEs and NFI increase. Quadratic life-cycle consequences (age variables) on both participation and level of participation in NFEs are as expected. The U-shaped effect of education in overall NFEs is not strongly evident; however, with few schooling years individuals may be less likely to participate in NFEs; and as schooling years increase, then education has a significant positive effect on NFEs. At the same time, with few schooling years, if individual participate in NFEs, NFI increases significantly. Individual multiple income sources and HNFE strength variable increase participation in NFEs, while out-country remittance strength variable decreases. Income diversification tends to decrease rather increase in overall NFI. However, all SNFLM variables contribute positively in overall NFI increase. Among other household variables, landholding, access to technical assistance, access to organizations, etc. are significantly important for NFEs. The community variable (growth center) is important for both participation and NFI increase.

4.1.2 Determinants of participation and level of participation in sector-wise NFEs

Now we focus on understanding participation and level of participation in sector-wise NFEs. Data presented in Tables 5 and 6 provide Probit and Censored Tobit regression results for individual participation and level of participation (as defined earlier) in sector-wise NFEs, respectively. For both participation and level of participation, we estimate five separate regressions and find all equations statistically significant. Based on the variable coefficients, following observations can be summarized.

Overall, the household workers' decisions differ quantitatively in terms of participations and NFIs sector-wise; however, individual age and multiple income sources, HNFE strength variable, female adults, and growth center for non-farm self-employments; all household SNFLM variables, landholdings and access to technical assistance for non-farm wage employments; individual education variable, household out-country remittance strength variable, demographics, education for in-country remittance employments; and individual gender, age, education, multiple income sources, household out-country remittance strength variable for out-country remittance employments are particularly important. For farm wage employments where the least poor household workers mainly participate, household local and in-country formal wage strength variables and access to technical assistance are not relevant; however, individual multiple income sources, household income diversification, out-country remittance strength variable, demographics, landholdings, and growth center greatly affect the farm wage employments.

4.2 Effects of NFEs on household production

4.2.1 Farm production effects

Results for both regressions (overall and sector-wise) in Tobit and OLS show that the regressions are statistically significant as a whole (Table 7). From the variable coefficients, several observations can be summarized. Though our sample considers the small households, results show that use of external inputs is related to landholdings and economies of scale are realized for relatively large landholding households. Moreover, input use is higher for principle crops (mainly fertilizer for rice production). Household head gender (male) has a positive bias on input use. We do not have any clear relation on input use of several variables, for example, household size, access to technical assistance, social capital and growth center.

However, income diversification is negatively related with input use. Implication is that households are more diversified; households are less likely to spend in farm input. As for the effect of various incomes on farm input use, only farming income is contributing significantly to higher input use. But NFIs, either overall or sector-wise, do not contribute significantly. This result is unexpected, but may be reasonable due to the fact that the NFIs might be spent mainly in household NFAs or consumption, which would be evident latter. Household farm worker cannot play the role of input substitution, as household farm worker increases, input use increases rather decreases. This is because of the fact that household workers do farming part-time and depend more on external inputs. This fact is partially supported by the positive coefficient of household hired worker (though it is not strongly significant), when we regress farm input use taking account the part-time farm households into the sample. Household head education reduces input use; however, per capita education increases input use. The reason might be that with additional

education, household workers might work part-time in NFS, be less caring about household farming and depend more on external inputs.

4.2.2 Non-farm production effects

Since the estimated regressions are statistically significant, we can summarize several observations based on the variable coefficients (Table 8). Income diversification is positively related with working capital at HNFES. Households are more diversified; they are more likely to spend in HNFES. Farming income has usual negative effect on HNFES' working capital. The effect of overall NFI is also as expected. As NFI increases, working capital increases. Among various NFIs, non-farm self-employment income and other unearned incomes are positively contributing to working capital. It is usual that the household non-farm self-employment income is reinvested in running HNFES. Household unearned incomes (liquids) also have impressive role in running HNFES. On the contrary, wage employment incomes (farm and non-farm) are negatively related with working capital. Unfortunately, remittance income either in-country or out-country is not significantly related with working capital as similar to farm input use. These results give us an idea that remittance incomes might be still limited in financing household food or non-food consumption which would be evident latter.

Table 5
Determinants of individual participation in sector-wise NFEs among small household workers in Comilla Sadar *Upazila* in 2007.
Probit estimates

Exogenous variables	Local employments			Remittance employments	
	Non-farm self-employments	Farm wage employments	Non-farm wage employments	In-country	Out-country
I_gen	.520*(.321)	.567(.580)	.357(.276)	2.197(1.695)	.894*(.503)
I_age	1.236**(.532)	1.433(1.048)	-.905**(.492)	-.890(1.063)	1.304(1.045)
I_age2	-.942*(.509)	-1.198(1.033)	.552(.520)	.9175(1.072)	-1.968*(1.103)
I_edu	-.153(.322)	-.007(.408)	.362(.238)	2.281** (1.122)	.707**(.627)
I_edu2	-.054(.416)	.162(.385)	-.129(.237)	-1.868** (1.040)	-.311(.261)
I_insc	.612***(.116)	.441***(.165)	.238**(.099)	.205(.273)	-.977***(.267)
divsn	.027(.236)	1.441***(.428)	-.019(.204)	2.010**(.065)	-.151(.289)
owhrnfe	2.00***(.242)	-1.605***(.546)	-1.172***(.243)	-1.265**(.706)	-.282(.326)
owfors	-.154(.338)	..	.309***(.264)	.331(.739)	.692(.523)
owincrm	.231(.475)	..	-1.166***(.366)	4.102(1.109)	.076(.608)
owoutcre	-.110(.291)	-.468(.537)	-1.719***(.288)	.740(.998)	3.937***(.731)
HH_size	-.253(.198)	.552(.412)	.273(.173)	-.910**(.477)	-.466(.240)
femadult	.321*(.193)	-.707**(.361)	-.180(.174)	1.241**(.650)	.468*(.268)
child_fem	.217(.175)	-.922***(.326)	.067(.146)	1.020**(.445)	-.044(.197)
depwkr	-.109(.115)	.354**(.153)	-.078(.089)	-.041(.257)	.043(.214)
hpc_edu	-.132(.433)	-.704(.809)	-.053(.386)	-2.012*(1.234)	-.123(.852)
hpc_edu2	.266(.423)	-.005(1.083)	-.013(.392)	2.246** (1.210)	-.100(.748)
landhold	-.030(.161)	-1.453***(.524)	-.352**(.151)	-.188(.263)	-.130(.166)
acc_org	.332(.291)	-1.283**(.547)	.104(.262)	-.152(.702)	-.498(.326)
Acc_credit	.145(.280)	.244(.535)	-.055(.259)	-.470(.787)	.053(.402)
Acc_ta	.015(.314)	..	.693**(.325)	.597(1.344)	-.231(.445)
Acc_frn	-.383(.327)	.680(.520)	.292(.314)	1.807** (1.0557)	-.103(.382)
Growth_c	.632**(.325)	-1.071**(.439)	.215(.243)	-.718(.711)	-.292(.414)
Constant	-3.047(.637)	-1.711(.832)	-.484(.453)	-8.119(2.710)	-4.429(.971)
Observations	377	256	377	377	377
LR Chi ²	195.85	84.30	183.76	97.15	243.97
Prob> chi ²	0.0000	0.0000	0.0000	0.0000	0.0000

Source: Field survey (2006).

Notes: 1) Numbers in parenthesis are standard errors; 2) Statistical significance: *** at 1%, **at 5%, * at 10% levels, respectively; 3) Variables under the dot mark (..) are dropped and 3) variables are standardized.

Table 6

Determinants of individual level of participation in sector wise NFEs among small household workers in Comilla Sadar *Upazila* (2007): Censored Tobit estimates

Exogenous Variables	Local employments			Remittance employments	
	Non-farm self employments	Farm wage employments	Non-farm wage employments	In-country	Out-Country
I_gen	40643.71(33028.23)	6349.92(10150.88)	17495.18*(10262.6)	-884.70(39040.42)	78441.46*** (33959.63)
I_age	141463.8*** (52429.36)	14591.32(17783.38)	-13999.63(17545.27)	-51363.5(53894.57)	99628.29*(58085.32)
I_age2	-109583.1** (50714.9)	-12836.82(17390.58)	7743.55(18658.96)	63097.51(54764.18)	-152470.9** (63225.54)
I_edu	-9440.99 (24216.3)	-9503.72(7931.24)	15839.15(8960.71)	109629.1** (53068.17)	62397.54*** (22765.61)
I_edu2	17595.7(22980.53)	6976.12(7851.36)	-6211.09(9123.58)	-68277.88(47049.03)	-26023.82*(14351.78)
I_insc	39629.5*** (10049.06)	8463.38*** (3316.71)	5321.29(3416.552)	1184.24(14104.37)	-59954.59*** (16714.74)
divsn	8510.48(22362.45)	27075.55*** (8563.25)	272.65(7118.65)	81262.04(52258.47)	-33516.67** (17175.56)
owhrnfe	180936.1*** (22844)	-33721.95*** (11816.52)	-44849.15*** (8785.68)	-94126.36* (53101.54)	7097.78(19196.87)
owfors	11695.06(31917.09)	-147714.4(..)	47672.38*** (8870.44)	27256.18(35448.63)	5310.16(27434.65)
owincrem	98810.57 *** (38476.27)	-177436.4(..)	-59249.15*** (15926.12)	297359.3*** (96496.13)	-57976.51* (35564.77)
owoutcre	3509.91(27910.79)	-2917.19(10692.72)	-57298.95*** (10579.69)	129407.8** (65837.21)	181745.2*** (29181.36)
HH_size	-18060.18(17709.74)	10843.62(8030.96)	4337.10(5915.48)	-89477.52** (39249.11)	-19544.7(12826.07)
femadult	36045.12*** (18185.18)	-10880.41(7103.46)	-3241.67(5910.93)	85618.1** (39969.08)	14943.56(14233.59)
child_fem	31850.5 *** (15756.14)	-15132.63** (6267.49)	4745.04(5116.07)	57907.97** (25290.74)	-9313.13(11942.55)
depwkrs	-8597.13(9479.95)	5472.16* (2903.02)	-2007.31(3190.87)	32055.59* (16865.99)	-2.59(11975.36)
hpc_edu	-34181.09(38427.12)	-21738.73(14691.36)	-6693.16(14202.47)	-59157.88(50126.08)	57454.42(49314.95)
hpc_edu2	27680.9(36295.61)	7647.44(18763.84)	4855.79(14268.3)	49744.04(46191.5)	-63932.28(44947.95)
landhold	8889.86(14100.36)	-29060.1*** (10297.09)	-8856.47* (5046.51)	-19466.47(17092.71)	16111.58* (9455.61)
acc_org	34243.58(26445.13)	-23432.25** (11186.77)	13353.45(8829.40)	9766.96(33842.47)	6413.30(19140.89)
Acc_credit	21820.92(25607)	5150.15(10949.38)	-3961.14(8727.86)	-1875.25(34494.97)	-32308.47(23176.43)
Acc_ta	-18986.17(29529.17)	-165600.3(..)	19072.65* (10431.73)	-33605.39(97130.92)	25072.5(25496.95)
Acc_fm	-38005.16(30168.14)	14538.17(10650.11)	9768.04(11415.66)	73612.45(47528.4)	7922.92(22918.18)
Growth_c	78960.5 *** (29844.1)	-20736.37** (8689.97)	2624.53(8521.54)	27252.84(39657.93)	-4626.06(24288.85)
Constant	-346445.3(61779.43)	-35157.4(16805.26)	-28022.76(16729.19)	-497713.7(179386.6)	-260214.2(53590.54)
Observations	377	377	377	377	377
LR Chi ²	171.12	111.36	170.43	102.36	252.38
Prob> chi ²	0.0000	0.0000	0.0000	0.0000	0.0000
Left-censored observations	288	349	269	358	297

Source: Field survey (2006)

Notes: 1) Numbers in parenthesis are errors; 2) Statistical significance: *** at 1%, **at 5%, * at 10% levels, respectively; and 3) Variables are standardized.

Table 7

Effects of NFEs on farm production among small households of Comilla Sadar *Upzila* in 2007 (endogenous variable= cash value of external inputs at household own farming)

Exogenous variables	Tobit		OLS	
	Regression 1	Regression 2	Regression 1	Regression 2
	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
Land_cultn	14741.87***(3627.19)	15533.28***(3630.01)	12967.49***(4055.12)	12868.49***(4226.35)
Land_culn2	-5243.21*(2911.68)	-5161.34*(2915.31)	-3777.06(3507.09)	-3059.73(3630.85)
Sprincrp	6089.28*(3361.38)	6472.35*(3392.68)	3066.56(3812.53)	3368.68(3928.56)
hired_1	-148.87(3458.07)	-198.97(3505.49)	1138.017(3923.11)	1777.28(4105.38)
	(p-value: 0.966)	(p-value: 0.955)	(p-value:0.772)	(p-vallue:0.666)
Farm_1	4797.50***(1197.31)	4353.01***(1216.15)	1237.72 (1144.72)	770.27(1191.82)
Divsn	-3631.93*(2116.09)	-3879.32*(2183.28)	-2335.03(2445.50)	-2189.10(2547.35)
Farminc	7676.54 ***(1368.74)	7288.44***(1373.94)	7266.92***(1571.37)	6716.04***(1605.32)
Nfinc_t	-944.68(2126.30)	..	414.86(1414.862)	..
Farmwaginc	..	469.44(1005.26)	..	334.25(1197.10)
nfsempinc	..	1084.04(1724.64)	..	2309.07(1374.72)
nfwempinc	..	-502.39(1122.01)	..	240.19(1301.16)
iinc_remit	..	-1839.25(1346.34)	..	-818.92(1189.33)
Outc_remit	..	-1591.64(1255.19)	..	-539.57(1570.94)
Oundinc	..	-67.65(1800.57)	..	368.65(1189.24)
hhh_gen	9831.37**(4650.87)	9643.35**(4634.35)	9504.60*(5350.02)	8628.36(5440.50)
hhh_edu	-3188.57 ** (1410.76)	-3553.13** (1457.16)	-3484.70** (1629.60)	-4082.33** (1711.61)
Hpc_edu	1825.52(1514.06)	2526.39*(1555.36)	1691.57(1719.08)	2247.30(1782.16)
hh_size	310.78(1078.54)	576.98(1090.47)	-38.49(1214.16)	139.77(1249.48)
acc_org	121.75(2535.44)	400.91(2545.05)	-217.47(2888.13)	-102.80(2949.02)
acc_cr	4279.57*(2542.17)	3504.25(2565.08)	4617.42(2904.84)	3605.48(2976.03)
acc_ta	1433.01(3556.22)	1369.36(3515.63)	1385.59(4369.68)	60.24(4434.35)
acc_frn	1591.85(2896.59)	2102.13(2910.04)	1848.47(3300.19)	2362.51(3348.19)
Growth_c	-2152.36(2353.93)	-2690.37(2404.89)	-2190.66(2677.41)	-3238.78(2784.08)
cons	147.08(5250.81)	791.58(5206.52)	8819.28(6139.75)	10131.16(6208.38)
Exogenous variables	17	22	17	22
LR chi ² (for Tobit)/	257.25	261.51	15.91	12.51
F (for OLS)				
Prob > chi ²	0.0000	0.0000	0.0000	0.0000
Pseudo R ² (for Tobit)/	0.0826	0.0840	0.6592	0.6590
Adj R ² (for OLS)				
Observations	175	175	132	132
Left-censored observations	43	43	..	..

Source: Field survey (2008)

Notes: 1) Numbers in parenthesis are standard errors; 2) Statistical significance: *** at 1%, **at 5%, * at 10% levels, respectively; 3) Variables are standardized; and 4) Variables under the dot (..) mark are not used

Table 8

Effects of NFEs on non-farm production among small households in Comilla Sadar Upzila in 2007 (endogenous variable= working capital at HNFES)

Exogenous variables	Tobit		OLS	
	Regression 1	Regression 2	Regression 1	Regression 2
	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
Landhold	-5100.72(17684.31)	-12605.7 (11605.7)	18542.76(17242.89)	-4844.32(11174.05)
hnfl	50185.17***(12985.01)	32273.21***(8801.21)	30861.94***(13304.1)	11826.64(8638.36)
Divsn	42992.65*(24876.9)	63464.44***(18688.78)	-19193.62(27272.87)	-9570.72(22776.79)
Farminc	-15440.51(15206.38)	-25089.24**(10760.24)	950.42(14691.63)	4742.67(10478.27)
Nfinc_t	145953.1***(11327.63)	..	222160.7***(15319.71)	..
Farmwaginc	..	-39453.71***(14203.43)	..	-6542.46(9231.30)
nfsempinc	..	105283.7***(11730.5)	..	66472.45***(21404.85)
nfwempinc	..	-72192.59***(12607.84)	..	-19820.33***(9493.71)
iinc_remit	..	-2635.06(11163.6)	..	4735.78(11385.2)
Outc_remit	..	7063.38(9856.84)	..	4084.58(5422.92)
Oundinc	..	63541.74***(11614.38)	..	169648.5***(22920.44)
hhh_gen	46385.95 (71751.79)	-19083.61(40883.45)	-86844.69 (81699.75)	-37810.15(55479.14)
hh_size	-20255.06*(11728.47)	3288.35(8238.35)	-35393.61*** (13321.95)	-1394.83(10094.55)
hhentr_edu	54270.25*** (13430.42)	12848.16(9838.59)	-29899.96(18490.43)	-5694.17(13050.68)
hh_pcedu	-13863.28***(5877.90)	-1996.24(4007.16)	9307.22(19604.65)	14857.37(12730.8)
acc_org	-305.03(30667.49)	-25190.82(19884.95)	-29599.58(33093.65)	-39455.02*(21519.45)
acc_cr	25105.3(29336.94)	36168.2***(18537.99)	26276.13(30508.06)	24392.48(19659.07)
acc_ta	-63130.98*(35355.92)	-33978.55(21752.53)	-44714.12(34963.08)	-18194.84(21933.88)
acc_frn	42583.76(32344.38)	25953.63(20221.34)	34993.97(33983.02)	27934.55(21120.08)
Growth_c	-19597.2(32906.4)	-38689.06*(21570.84)	-75989.71***(39747.09)	-53920.41***(25368.48)
cons	-62741.64(78283.58)	-41767.05(45842.5)	236147.5(97015.43)	169701.1(63766)
Exogenous variables	14	19	14	19
LR chi ² (for Tobit)/	171.01	276.82	24.27	51.94
F (for OLS)				
Prob > chi ²	0.0000	0.0000	0.0000	0.0000
Pseudo R ² (for Tobit)/	0.0812	0.1315	0.8232	0.9325
Adj R ² (for OLS)				
Observations	175	175	72	72
Left-censored observations	103	103	..	..

Source: Field survey (2008)

Notes: 1) Numbers in parenthesis are standard errors; 2) Statistical significance: *** at 1%, **at 5%, * at 10% levels, respectively. 3) Variables are standardized. 4) Variables under the dot (..) mark are not used

Among other variables, landholding is not related with working capital at HNFES. As household non-farm worker increases, working capital increases rather decreases. It may be due to the labor intensive nature of HNFES. Household size is negatively related with working capital. Per capita education tends to spend less for HNFES; however, entrepreneurs' education tends to spend more for HNFES. Access to organization and access to technical assistance reduce, while access to formal credit sources increases working capital. However, availability of growth center reduces working capital at HNFES.

4.3 Effects of NFEs on poverty

4.3.1 Effects on calorie adequacy

Since our estimated 2SLS regressions are statistically significant as a whole, we can summarize several observations based on the variable coefficients (Table 9). Farming income is still the most

significant for calorie adequacy: a 10% increase in farming income improves calorie adequacy by 0.04% (0.03% in case of sector-wise incomes). This finding is usual and consistent with similar studies (for example, Ruben and Berg, 2001). But the effect of income diversification and overall NFI on calorie adequacy is not significantly positive. Such results might be surprising but reasonable due to the fact that the overall NFI is positively contributing to working capital at HNFEs. All NFIs (especially remittance incomes) reduce calorie adequacy rather increase. Since remittance incomes do not contribute in household production either farming or NFAs and calorie adequacy positively, these must be spent on household non-food consumption.

Among other variables, the availability of growth center positively contributes on food adequacy. Two variables such as (household size and access to friends, relatives, neighbors, etc.) give contradictory sign on food adequacy as we expect. All other variables are not significantly related with food adequacy.

Table 9

2SLS estimation of calorie adequacy at the small households in Comilla Sadar *Upzila* in 2007 (N=175) (endogenous variable= log of calorie adequacy ratio for small households for a day)

Exogenous variables	Regression 1	Regression 2
	Coefficient (Standard Error)	Coefficient (Standard Error)
lhcaln	-1.084***(.359)	-1.034***(.344)
Diversfn	.012(.068)	.092(.073)
lfarm_inc	.036**(.017)	.026*(.016)
Lnfinct	.004 (.054)	..
lfarmwaginc	..	-.022**(.009)
lnfse_inc	..	-.010(.006)
lnfwe_inc	..	-.010(.007)
linc_remit	..	-.034***(.012)
lOutc_remit	..	-.030***(.008)
lOueand_inc	..	.002(.007)
acc_credit	.068(.063)	.009(.064)
lLand_culn	-.002(.028)	.017(.029)
Hh_lpf	.094(.077)	.116(.074)
Acc_frn	-.195**(.087)	-.123(.083)
lhhh_edu	-.030(.040)	-.029(.038)
lhpcpedu	.070(.076)	.107(.075)
lhh_size	.911**(.416)	1.119***(.403)
lfem_adults	-.026(.114)	-.117(.113)
Child_fem	-.011(.047)	-.061(.046)
Dep_wkr	-.008(.024)	-.033(.024)
Acc_gc	.212***(.071)	.187***(.071)
cons	7.719(2.651)	7.405(2.556)
F(20, 154)	2.25	2.85
Prob> F	0.0080	0.0002
Adj R ²	0.1219	0.2149

Source: Field survey (2008)

Notes: 1) Numbers in parenthesis are standard errors; 2) Statistical significance: *** at 1%, **at 5%, * at 10% levels respectively; 3) Variables under the dot (..) mark are not used

Table 10
Poverty levels of small households in Comilla Sadar *Upazila*, 2007

Poverty measures	Income poverty (by lower poverty line)	Income poverty (by upper poverty line)	Education poverty
Poverty incidence (%)	12.6	20.0	42.3
Poverty gap (%)	3.1	5.2	19.0
Poverty severity (%)	1.1	2.0	10.8

Source: Field survey (2008)

Table 11
Characteristics of small households by poverty incidence in Comilla Sadar *Upazila*, 2007

Characteristics	By income poverty incidence (mean)		By education poverty incidence (mean)		Total sample	
	Non-poor	Poor	Non-poor	Poor	Mean	S.D.
divsn	50.0	25.7	52.1	40.56	45.14	49.91
owhrnfe	34.28	17.14	33.33	.2924	30.86	46.32
owfors	16.42	2.86	24.64	6.60	13.71	34.49
owincrm	8.57	2.86	11.59	4.72	7.43	26.30
owoutcre	40.7	0	52.17	19.81	32.57	47.0
child_fe	1.02	1.97	1.11	1.28	1.21	1.13
dep_wkrs	1.87	3.23	1.95	2.27	2.14	1.53
landd8	.59	.15	.81	.31	.51	.65
whhpl	64.3	54.3	58.0	65.0	63.0	49.77
iasinst	57.9	48.7	59.4	53.8	56.0	49.78
acc_cr	35.7	37.1	33.3	37.7	36.0	48.13
acc_ta	12.3	5.7	11.6	10.6	10.98	31.35
acc_fm	13.6	8.6	14.5	11.4	12.64	33.33
growth_c	80.0	68.6	79.7	76.4	77.71	41.73
primy_s	87.86	62.85	92.8	76.4	82.86	37.80

Source: Field survey (2008)

4.3.2 *Income poverty effects*

As mentioned in sub-section 2.3.2, the relevant poverty line incomes are BDT ² 9,688.40 and BDT 11,463.96, respectively for lower and upper income poverty lines. According to lower income poverty line, only about 13% people among the small households are poor (Table 10). Since our focus is not to understand how big the income poverty is among the small households, however, to understand the effects of NFEs on income poverty, we analyze income poverty effects based on the upper income poverty line; though the upper income poverty incidence (20.0%) is much below than the national rural income poverty incidence (about 44%). As the study area represents a relatively developed rural locality, the income poverty incidence is not comparable with the national statistics. However, compared to upper income poverty incidence (20.0%), poverty gap (5.2%) and poverty severity (2.0%) are not so acute among the small households.

As depicted in Table 11, income-poor/non-poor classification of small households shows that the income non-poor households (50%) are more diversified than the poor counterpart (26%). All NFLMS variables are weak for the income-poor households. Differences are also observed in household demographics, capitals/assets and community level characteristics.

² As of 2006-07, US\$ 1.00 = BDT (Bangladeshi Taka) 69.03 (GOB, 2008).

Regression results suggest that the equations are as a whole statistically significant (Table 12). Variable coefficients give us some important observations. Income diversification is not significantly related with income poverty. However, all SNFLM variables are significantly important for income poverty, though their effects differ at income poverty levels (incidence, gap and severity). Household out-country remittance strength variable is not used at poverty incidence regression; because, a household with at least one worker employed in out-country remittance employments does not fall into income poor category. Among other three SNFLM variables, HNFE strength variable is more income poverty reducing. Landholding is crucially important for reducing income poverty among other variables.

Table 12
Effects of NFEs on poverty among small households in Comilla Sadar *Upazila* in 2007 (N=175)

Exogenous variables	Income Poverty			Education poverty		
	Poverty incidence: Probit estimate	Poverty gap: OLS	Poverty severity: OLS	Poverty incidence: Probit estimate	Poverty gap: OLS	Poverty severity: OLS
hpc_inc	..	..	..	.000(0.000)	0.000(0.000)	0.000(0.000)
divsn	-.023(.332)	.002 (.002)	-.009(.033)	.289(.249)	.001(.000)	-.000(.000)
hhh_gen	-.547(.720)	.000(.003)	.007(.070)	-.215(.523)	-.000(.001)	.000(.001)
owhrnfe	-1.088***(.400)	-.006*** (.002)	.075**(.036)	-.324(.268)	-.001(.000)	-.000(.000)
owfors	-.968*(.596)	-.004(.003)	.015(.050)	-1.318***(.371)	-.003***(.001)	...
owinrem	-.347(.716)	-.009*** (.003)	.195***(.065)	-.785(.496)	-.002**(.001)	.002**(.001)
owoutcre	...	-.008*** (.002)	.195(.065)	-1.015***(.317)	-.001***(.001)	.000(.001)
hhsz	.021(.122)	.000(.001)	-.007(.013)	.052(.095)	-.000(.000)	.001(.001)
femadult	.1425(.313)	.002(.002)	.000(.031)	.105(.230)	.000(.000)	-.001**(.000)
child_fe	.417**(.231)	.001(.001)	.023(.023)	-.031(.175)	.000(.000)	-.001**(.000)
dep_wkrs	.269***(.109)	.001**(.001)	-.0144(.0125)	-.001(.104)	.000(.000)	.000(.000)
hpcapedn	-.065(.073)	.000(.0003)	-.002(.007)	..	..	..
landd8	-1.445**(.662)	-.006*** (.001)	.066**(.029)	-.741***(.220)	-.002***(.001)	.001***(.000)
whhpl	-.284(.298)	.001(.002)	.066(.029)	.320(.251)	-.002(.000)	-.000(.000)
Acc_org	.202(.446)	-.002(.002)	.048(.041)	-.243(.308)	-.000(.000)	.000(.001)
acc_cr	-.044(.466)	.001(.002)	-.026(.044)	-.281(.327)	-.001(.001)	.001(.001)
acc_ta	-.068(.589)	-.004*(.003)	-.021(.052)	.217(.379)	.000(.001)	.001(.001)
acc_fm	-.342(.479)	.001(.002)	-.032(.048)	-.135(.355)	-.000(.001)	-.000(.001)
growth_c	-.242(.344)	-.002(.002)	.042(.039)	..	..	..
primy_s	..	..	..	-.460(.406)	-.001(.001)	.000(.001)
Cons	-.533(.952)	-.007(.005)	-.029(.103)	1.146(.847)	.003(.001)	.002(.001)
Exogenous variables	17	18	18	18	18	18
LR chi ² (for Probit)/ F (for OLS)	67.66	6.92	2.19	66.58	6.21	2.87
Prob >chi ²	0.000	0.000	0.006	0.000	0.000	0.000
Pseudo R ² (for Probit)/Adj R ² (for OLS)	..	.38	0.11	..	0.35	0.16

Source: Field survey (2008)

Notes: 1) Numbers in parenthesis are standard errors; 2) Statistical significance: *** at 1%, **at 5%, * at 10% levels, respectively; 3) Variables under two dots (..) are not used; 4) Variables under three dots (...) are dropped.

4.3.3 Education poverty effects

Based on the education poverty line mentioned in sub-section 2.3.3, about 42% of small households are education poor. The education-poverty gap and severity are also worse than income poverty levels. Such a picture of education poverty seems to be alarming. Implication may be that the increasing NFIs might not be realizing in achieving household human capital, for example, education; and/or, the government primary education programs might not being successful to achieve household universal level of education. Our regression results might explore this answer.

However, education-poor/non-poor classification of small households shows that the education-poor households (41%) are less diversified than the non-poor counterpart (52%). Like income-poor households, the SNFLM variables are also weak for the education-poor households. Differences are also evident in household demographics, capitals/assets and community level characteristics.

Regression results suggest that the per capita income and diversification variables are not significantly related with education poverty. However, three formal SNFLM variables are significantly important for education poverty; while local formal sector strength and out-country remittance strength variables are important for education poverty incidence and gap, and in-country remittance employment strength variable is important for education poverty-severity. Government primary education related variable is not significantly related with education poverty. Among other variables, the role of landholding is as similar to income poverty.

5. CONCLUSIONS

The NFAs are no longer marginal among small households and their workers. Individual multiple income sources and HNFE strength variable increase participation in overall NFEs, while out-country remittance strength variable decreases. Income diversification tends to decrease rather increase in overall NFI. However, all SNFLM variables contribute positively in overall NFI increase. The household workers' decisions differ quantitatively in terms of sector-wise participations and NFIs.

Income diversification is negatively related with own farming, while positively with NFAs. The NFI either overall or sector-wise does not contribute significantly in own farming. But farming income and overall NFI have significant positive effect on own farming and NFAs, respectively. Among various NFIs, non-farm self-employment income and other unearned incomes have significant positive effect on NFAs, while wage employment incomes (both local and remittance) do not have any significant positive effect on NFAs.

The effect of income diversification and overall NFI on food adequacy is not significantly positive; while only farming income has significant positive effect on food adequacy. All NFIs, especially remittance incomes, reduce food adequacy. Since remittance incomes do not contribute in household production either farming or NFAs and food adequacy, these must be spent on non-food consumption.

Education-poverty levels are worse than income poverty levels among small households. Such a picture of education poverty seems to be alarming. Income diversification is not significantly important for reducing income poverty and education poverty as well. All SNFLM variables are significantly important for reducing income poverty, while three formal SNFLM variables are for education poverty.

Thus, the increasing NFI is reducing some income poverty, but it is yet to realize in achieving household members education; however, access to formal sector employments by the small household workers is significantly reducing education poverty. Therefore, qualitative diversification of the poor household workers and productive use (preferably in education and HNFES) of household remittance incomes deserve special attention.

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Appendix 1 Definitions of the exogenous variables

Items		Variable names	Description
Individual level	Gender	I_gen	Individual gender (1 if male)
	Age	I_age	Individual age (years)
		I_age2	Individual age squared (years squared)
	Education	I_edu	Individual education (schooling years)
		I_edu2	Individual education squared (schooling years squared)
Multiple Income sources	I_insc	Individual income sources (numbers)	
Household level	Fixed production factors	landhold	Landholdings owned (acres)
		Land_cultn	Landholdings under cultivation (acres)
		Land_culn2	Landholdings under cultivation squared (acres squared)
		Sprincrp	Share of principal (rice) crops (%)
		hired_1	Whether household uses hired farm worker (1 if yes)
		Farm_1	No of working persons involved in household farming
		hnfel	No of working persons involved in HNFes
	Income diversification	divsn	A household is diversified if a single income source contributes less than 75% of its income (1 if yes)
	Strengths to non-farm labor market (SNFLM)	owhrmfe	At least one worker employed as relatively high-productive non-farm enterprises (1 if yes)
		owfors	At least one worker employed as salaried employments in the local formal sector (1 if yes)
		owincrem	At least one worker employed in in-country remittance employments (1 if yes)
		owoutcre	At least one worker employed in out-country remittance employments (1 if yes)
	Incomes (liquidities)	Hhpc_inc	Household per capita income (BDT)
		Farminc	Household farm income (BDT)
hnfinc_t		Household non-farm incomes_total (BDT)	
Famwaginc		Household farm wage income (BDT)	
nfsempinc		Household non-farm self-employment income (BDT)	
nfwempinc		Household non-farm wage-employment income (BDT)	
iinc_remit		Household in-country remittance employment income (BDT)	
Outc_remit		Household out-country remittance employment income (BDT)	
Oundinc	Household other unearned (rentals, pensions, interest, gifts, etc.) income (BDT)		
Food requirement	hcaln	Household calorie needs (k.cal/day)	
Demographics, preferences, efficiency	HH_size	Household members (numbers)	
	Hhh_gen	Household head gender (1 if male)	
	femadult	Female adults (numbers)	
	child_fem	Children-female adults ratio	
	depwkr	Dependents-workers ratio	
	Hhh_edu	Household head education (schooling years)	
	hpc_edu	Per capita education (schooling years)	
	hpc_edu2	Per capita education squared (schooling years squared)	
	Hhent_ edn	Household non-farm entrepreneurs' education (schooling years)	
	whhpl	Whether household cultivates poultry, fisheries and livestock (1 if yes)	
	acc_org	Structural social capital: Is household involved with any GO/NGO/Cooperative/business association etc.? (1 if yes)	
	Acc_credit	Is household receiving any credit from formal sources? (1 if yes)	
	Acc_ta	Is household receiving any technical assistance/advice from formal sources? (1 if yes)	
	Acc_fm	Cognitive social capital: Is household receiving any assistance from friends, relatives, neighbors? (1 if yes)	
Community level	Growth center	Growth_c	Availability of growth centers, market or bazar within 1 km reach (1 if yes)
	Primary school	primy_s	Availability of government primary schools within 1 km reach (1 if yes)