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FARMERS' LIVELIHOOD THROUGH 'ONE HOUSE ONE FARM' APPROACH IN SELECTED AREAS OF MYMENSINGH DISTRICT OF BANGLADESH

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ABSTRACT

The study was attempted to analyze the impact of 'one house one farm' approach on farmers' livelihood status in some selected areas of Mymensingh district. As the study was based on comparing the farmers' livelihood, a total of 90 farmers where 45 farmers were selected randomly who were under this project and the rest of 45 farmers were selected who were not under this project from Bhabkhali, *Char* Nilakshmia and *Char* Ishwardia union under sadar upazila. The primary data were collected through direct interview method from the selected farmers using structured questionnaire. Data were analyzed with a combination of descriptive statistics and econometric analyses like logistic regression and propensity score matching methods to attain the objectives. Sex distribution, family size, training exposure and farm income have positive and significant impact on the adoption of this project. Based on Kernel and Radius matching methods, the average farm household income of the project farmer was increased by the amount of Tk. 28,561.4 to Tk. 16,445.6 per year compared to non-project farmers which is statistically significant at 1% level. Overall employment opportunities were increased by the duration of 22 to 36 man-days for the project farmers compared to non-project farmers. Daily per capita calorie intake from different food items was higher for project farmers than the non-project farmers. The access on human capital, social capital, natural capital, physical capital and financial capital for project farmers were increased by 29.5%, 25.7%, 9.0%, 18.3% and 22.3%, respectively due to the adoption of 'one house one farm' approach. The study also identified some problems faced by the farmers for adopting the project and probable solutions related to those problems. If these problems could be solved within a reasonable time, farmers would be

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more enthusiastic to adopt the project idea for earning more income which helps them to change their livelihood status ultimately.

Keywords: Employment, income, livelihood, 'one house one farm' approach

INTRODUCTION

Bangladesh accounts for a significant portion of the world's poor with nearly 26% people living below the poverty line (BER, 2013). The abundant population of Bangladesh has a high growth of unemployment, which is marked by expansion of poverty in the rural areas as well as urban areas. 'One house one farm' project is a top prioritized family farming and poverty reduction program financed by Government of Bangladesh.

As agriculture plays a major role in the livelihoods of rural households in securing national food self-sufficiency, this approach is an important option to improve livelihood status of the rural households as well as the country's overall economic development. Reportedly, over the last 30-40 years, the availability of agricultural land has been declining at the rate of 1% per year (Ershad, 2002). In rural areas, about 4.48 million households are landless (Ershad, 2002). Another problem is arising due to urbanization, i.e., the number of absentee land owners is increasing in the rural areas. About 10% absentee land owners own 50.6% of the total cultivable land of Bangladesh (Ershad, 2002).

As all the elements of the driving force of the economy prevail in the rural areas, the overall development of this country depends virtually on the development of its rural areas. These hard working people can cultivate the fertile land of Bangladesh, develop farm at every house of every village and increase the overall production of the country in multiple times. Viewing this fact, Government of Bangladesh manifests a project of 'one house one farm' (*Ektee Bari Ektee Khamar*) with the vision of 'poverty alleviation and sustainable development through fund mobilization and farming'. The project will cover 9640 villages in 1928 unions under 482 upazilas of the country. The project will enable the rural poor and the community people with the physical and financial supports to find for their self-employment opportunities. As, farmers are the main executor and beneficiaries of this project, so the managing committee is so much concerned and handed over the responsibilities to Bangladesh Rural Development Board (BRDB). BRDB is the leading executing agency of this project. The duration of the project is seven years starting from July, 2009 to June, 2016 worth of Tk. 5.927 billion. About five million poor rural families will be benefitted from this project (Ullah, 2011).

The intrinsic goal of the project was to reduce national poverty to 20% from 40% by 2015 through developing each of the house as a unit of agro-economic activities by utilizing human and financial resources of the family members. The farmers can produce diversified products which will ensure their food security and

maintain economic stability. To sustain accelerated and inclusive growth, Bangladesh will need to manage the urbanization process more effectively as well as prepare for adaptation to climate change impacts. Keeping these facts in mind, the proposed project has been undertaken to enhance the socioeconomic status of the rural poor. Through this project, farmers get knowledge about how enterprises, i.e., crop, fisheries, livestock and homestead, contribute to improve their livelihood and ensure food security. Besides, farmers are including more enterprises in farm practices to have better food security and improving livelihood. However, the findings of the study would help the policy maker to build up a poverty and hunger free country for changing the lots of the poor and also materializing the dreams of digital Bangladesh as per vision 2021 of the present government. A unpretentious effort has been made here to assess the preceding research studies which are: Islam et al., (2013) conducted a research on competency assessment of the farmers on the application of 'one house one farm' approach in some selected areas of Mymensingh district; Ullah (2011) carried out a research on farmers' perception towards 'one house one farm' approach in Mymensingh district; USAID (2011) reviewed nutrition and food security impacts of agriculture projects in Uganda which justified the positive and significant agricultural interventions to ensure the food security and nutrition impacts; Khan et al. (2009) conducted a research on homestead vegetable gardening in Tangail to develop a model for year-round vegetable production in order to improve the household food security and nutrition to generate additional income by selling surplus vegetables; and to create employment opportunity for women and children of the family. Hossain et al. (2007) conducted a study on FoSHoL-CARE project to assess the existing farming system in Barind tract in Rajshahi division and identified the perceived needs and constraints of the farmers in the areas; and Talukder et al. (1997) observed home gardening activities in selected villages in Bangladesh and documented that underway in different home gardening interventions the farmers in the rural areas can increase their income.

The above review of literature exhibits that there is no study which attempted to analyze the impact of 'one house one farm' project on farmers' livelihood. Therefore, the overall objective of this study is to assess the present status of 'one house one farm' project and its impacts on farmers' livelihood. The specific objectives are: i) to determine the factors affecting adoption of 'one house one farm' approach; ii) to estimate the impact of 'one house one farm' project on income generation, employment creation and livelihood pattern of the sample farmers; and iii) to suggest policy options for overcoming constraints and exploring possible opportunities.

MATERIALS AND METHODS

Keeping in view the objectives, the study was conducted in three unions under Mymensingh sadar upazila, where 'one house one farm' farmers were available. Bhabkhali, *Char* Nilakshmia and *Char* Ishwardia unions were selected purposively as study areas. A total of 90 farmers were interviewed using structured questionnaire for collection of data and information. Face-to-face interview method was conducted by the researcher herself. The researcher also collected documents from Bangladesh Rural Development Board (BRDB) for this purpose.

Analytical techniques

In order to investigate the extent of influence on the decision making status, logistic regression analysis was used. The binary variable was assigned with the value 1 for decision that is taken by project farmers alone and zero otherwise. The logit model has been specified as follows:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i} + Ui$$

Here,

Y_i = It is a binary variable having 1 for indicating adoption and 0 indicating Non-adoption;

X_1 = Sex (i.e., male =1, female = 0); X_2 = Age of respondents (years);

X_3 = Years of schooling of respondents; X_4 = Family size (no.); X_5 = Farm size (ha);

X_6 = Received training i.e., 1 indicates receiving training where 0 indicates not receiving training;

X_7 = Total farm income (tk.);

X_8 = Total off-farm income (tk.); and U_i = Error term.

To evaluate the impact on income generation, techniques of propensity score matching (PSM) were applied with Kernel matching and Radius matching methods.

Kernel matching method

Kernel matching is simply a Kernel density function. In this method, all of the observations in the comparison group inside the common support region are used. Kernel matching method can be written as follows:

$$E(\Delta Y) = \frac{1}{N}\sum_{i\in T}\left[Y_{i,1} - \frac{\sum_{j=1}^{N_i^C} Y_{j,0}^i K\left(\frac{P(X_{j,0}^i) - P(X_{i,1})}{b_W}\right)}{\sum_{j=1}^{N_i^C} K\left(\frac{P(X_{j,0}^i) - P(X_{i,1})}{b_W}\right)}\right]$$

Where, T is the set of observations that are in the project (treatment group), and N is the number of treated cases; $Yi,_1$ and $Xi,_1$ are the dependent and independent

variables for the i^{th} treated case; $Y_{j,0}^{i}$ and $X_{j,0}^{i}$ are the dependent and independent variables for the j[th] comparison/control case that is within the neighborhood of treatment case i.e., for which $\left|P\left(X_{j,0}^{i}\right) - P\left(X_{i,1}\right)\right| <$ bw/2; N_i^C is the number of comparison cases within the neighbourhood of i; K(•) is a kernel function; and b_w is a bandwidth parameter. In practice, the choices of K (•) and b_w are somewhat arbitrary.

Radius matching method

Radius matching method can be written as follows:

$$R^M = \frac{1}{N^T}\sum_{i \in T} Y_i^T - \frac{1}{N^T}\sum_{j=C} w_j Y_j^C$$

Where, the weights w_j are defined as $w_j = \sum_i w_{ij}$; Y^T = Output of treated individual; and Y^C indicates output of control individual.

Poverty indices or head count ratio and poverty gap is estimated in this research to evaluate the impact of intervention on farming practices. A food security index (Z) was constructed and food security status of each household was determined based on the food security line using the recommended daily calorie intake approach. A household which daily per capita calorie intake up to 2122 kcal was regarded as food secure and those below 2122 kcal regarded as food insecure households. The mathematical representations are as follows:

$Z_i = Y_i/R$

Where,

Z_i = Food security index for i[th] household which takes the value of 1 for food secured and that of 0 for food insecure households, that is $Z_i = 1$ for Y_i is greater than or equal to R; and $Z_i = 0$ for Y_i less than R.

Y_i = Daily per capita calorie intake of i[th] households;

R = Daily per capita calorie required for i[th] households; and i = 1, 2, 3……., 90.

Surplus or Shortfall Index

Based on the household food security index (Z), food insecurity gap/ surplus index (P) and the head count ratio (H) were calculated. Food insecurity gap measures the extent to which households are food insecure and surplus index measures the extent by which food secure households exceeded food security line. This index is given as:

$$P = \frac{1}{M}\sum_{i=1}^{m} Gi$$

Where,

P = Food insecurity gap or surplus index; M = Number of households that are food secured (for surplus index) or food insecured (for food insecurity gap); and

G_i = Per capita calorie intake deficiency (or surplus) faced by i^{th} household.

$$G_i = \left(\frac{Yi - R}{R}\right)$$

The head count ratio (H) measures the percentage of the population of households that are food secure or insecure. This is defined as:

$$H = \frac{M}{N}$$

Where,

H = Head count ratio; M = Number of households that are food secured (for surplus index) or food insecured (for food insecurity gap); and

N = Number of households in the sample.

To measure the income inequality Gini index (Gini coefficient) was used. The range of the Gini index is between 0 and 1 (0 and 100 percent), where 0 indicates perfect equality and 1(100 per cent) indicates maximum inequality. At first, calculating cumulative percentage of income and individual, plotting the results into a graph where X axis represented cumulative percentage of individual and Y axis represented cumulative percentage of income. Then, the author used following formula for estimating the Gini coefficient as well as the income inequality:

$$\text{Gini coefficient, } GC = | \sum Y_i X_{i+1} - \sum X_i Y_{i+1} |$$

Livelihood pattern was measured by presenting the assets in a framework which is known as asset pentagon. Asset pentagon is composed of five types of capitals namely, human capital, social capital, natural capital, physical capital and financial capital (DFID, 2000).

RESULTS AND DISCUSSION

Socioeconomic characteristics of the farm household

The survey was conducted among the households of which 93% male and 7% female for the project farmers whereas 60% were male and 40% were female for the non-project farmers. In case of project farmers, 65.7% persons were belonging to 15-55 years. Again, in the case of non-project farmers, 49.7% persons were belonging to 15- 55 years. Nearby 40.6% project farmers have passed secondary level. But, for non-project farmers it was only 34.8% (Table 1). For project farmers, on an average, 20.6% were engaged in agriculture, 5.4%, 7.8% of them were involved in small business, labour as their main occupation. About 17.9%, 2.2%, 8.9% were engaged in agriculture, small business and labour work, respectively as main occupation for non-project farmers. Households under project farmers, an average farm size 0.60 hectare

while non-project farmers have an average farm size of 0.57 hectare. Only 31.1% farmers were received training. But, non-project farmers were received from DAE and BAU where only 4, 1 respondents received short-term and mid-term training as well as a negligible percent, only 11.1%, of farmers were received training

Table 1. Socioeconomic characteristics of the farm household

Particulars			Project farmers	Non-project farmers
Family size, age, education level, occupational status, land type and farm household				
Sex (%)	Male		93	60
	Female		7	40
Family size (no.)			4.5	4.3
Age (15-55 years) (%)			65.7	49.7
Educational level (years of schooling)		Secondary (%)	40.6	34.8
Occupational status (%)	Agriculture		20.6	17.9
	Small business		5.4	2.2
	Wage labour		7.8	8.9
Land holding (ha)	Average		0.60	0.57
Area and number of agricultural enterprises	Crop area (ha)		0.39	0.34
	Livestock (no.)	Large animal	4.31	2.62
		Small animal	40.8	29.5
	Fisheries (ha)		0.02	0.03
	Homestead (ha)		0.69	0.57
	Agroforestry (no.)		13.4	8.9
Training exposure (%)			31.1	11.1

Source: Field survey, 2015.

Factors affecting adoption of 'one house one farm' approach

In this study, the dependent variable Y (adoption and non-adoption) was defined to have two possible outcomes: i. the farmers are adopting 'one house one farm' approach, and ii. the farmers are not adopting 'one house one farm' approach, which are coded 1 and 0, respectively. The result of logit regression is presented in table 2. The result shows that the model was accurate in explaining the determinants of adoption of 'one house one farm' approach of farm household. Four out of eight variables included in the model were significant in explaining the variation in

adopting 'one house one farm' approach in the study areas. Therefore, the estimated equation is as follows:

$$Y_i = 36.397 - 0.010\ X_1 + 0.037\ X_2 - 0.054\ X_3 + 0.352X_4 + 1.223\ X_5 + 0.341\ X_6 + 2.802\ X_7 - 0.569\ X_8$$

Table 2. Empirical results of logistic regression of determinants of 'one house one farm' approach

Variables	Coefficient (β)	S.E.	t	Level of significance	Odds ratio
Age (X_1)	-0.010	0.017	0.318	0.573	0.990
Sex (X_2)	0.037***	0.609	2.004	0.001	1.037
Education level (X_3)	-0.054	0.061	0.784	0.376	0.947
Family size (X_4)	0.352**	0.153	5.304	0.021	1.422
Receive training (X_5)	1.223**	0.593	4.251	0.039	0.294
Farm size (X_6)	0.341	0.450	0.572	0.449	1.406
Farm income (X_7)	2.802**	1.234	5.158	0.023	0.061
Non-farm income (X_8)	-0.569	0.432	1.736	0.188	0.566
Constant	36.397	15.611	5.436	0.020	$6.411E^{15}$

Source: Authors' estimation, 2015.

Note: *** indicates significant at 1% level;** indicates significant at 5% level; and * indicating significant at 10% level.

Sex (X_2): The regression coefficient of sex is 0.037 significant at 1% level, which presents that remaining other factors held constant, adoption of the 'one house one farm' project positively influenced by 0.037 unit, for one unit increase of adopting this project by female farmers. That means the probability of adopting the project by the female is higher compared to male members.

Family size (X_4): It is found that regression co-efficient of family size is 0.352 significant at 5% level, which implies that remaining other factors constant, adoption of the project positively influenced by 0.352 unit for one unit increase in family size. That means a unit increase in family size will increase the probability of adopting this project by 0.352 units.

Receive training (X_5): The regression coefficient of received training was estimated at 1.223 significant at 5% level, which means holding other variables constant, if the farmers' received training increases by one unit, the probability of adoption would increase by 1.223 units.

Farm income (X_7): The regression coefficient of farm income was estimated at 2.802 significant at 5% level, which means, holding other factors constant, if the farm income increases by one unit, the adoption of the project would increase by 2.802 units. This indicates that the higher the farm income, the higher is the probability that the farmer would be able to adopt this project willingly.

Age of respondent, education level and non-farm income has a tendency to exhibit negative effect on the probability of adopting this project and these variables were statistically insignificant. Farm size presents positive effect but this variable was statistically insignificant.

Impact on income generation, employment creation and livelihood pattern

Impact of 'one house one farm' approach on farmers' income generation: propensity score matching method

To test the consistency of the results, propensity score matching method was also used to evaluate the impact of 'one house one farm' on farm households' income generation. In this method, all of the observations in the comparison group inside the common support region were used.

Table 3. Impact on farmers' income generation

Matching method and outcome	Project farmers			Non-project farmers		
	Average treatment on treated (ATT)	Standard error	t-value	Average treatment on treated (ATT)	Standard error	t-value
Farm income (Tk.)						
Kernel matching	16445.6	8895.4	7.048*	10386.7	8967.3	5.31*
Radius matching	28561.4	13864.8	4.898**	12237.5	9371.0	3.02**
Non-farm income (Tk.)						
Kernel matching	-10739.4	10844.6	-1.53***	-5635.1	2210.3	-2.54**
Radius matching	-9456.01	12239.1	-1.02	-4956.2	2319.9	-2.13***

Source: Authors' calculation based on field survey, 2015.

Note: *** Significant at 1 percent level; ** Significant at 5 percent level; and * Significant at 10 percent level.

Based on Kernel and Radius matching methods, the average farm household income of the project farmer was increased by Tk.16445.6 to 28561.4 per year compared to non-project farmers which is statistically significant at 1% level. On the other hand, non-farm income was decreased slightly but it is not statistically significant in both the methods (Table 3).

Impact on farmers' income generation: income inequality metrics

The range of the Gini index is between 0 and 1 (0 and 100 percent), where 0 indicates perfect equality and 1 (100 percent) indicates maximum inequality. The Gini index is the most frequently used income inequality index. The reason for its popularity is that it is easy to understand how to compute the Gini index as a ratio of two areas in Lorenz curve diagrams. The Lorenz curve is a diagonal 45^0 line in societies that have perfect income equality which plots the proportion of the total income of the population (Y axis) that is cumulatively earned by the bottom X axis percentage of the population (see diagram). Gini coefficient of project farmers was 0.179 while it was 0.286 for non-project farmers. Figure shows that project farmers were less unequal than non-project farmers. The figure indicates that non-project farmers are far from Lorenz curve while the project farmers are quite near to Lorenz curve which shows the inequality clearly (Figure 1).

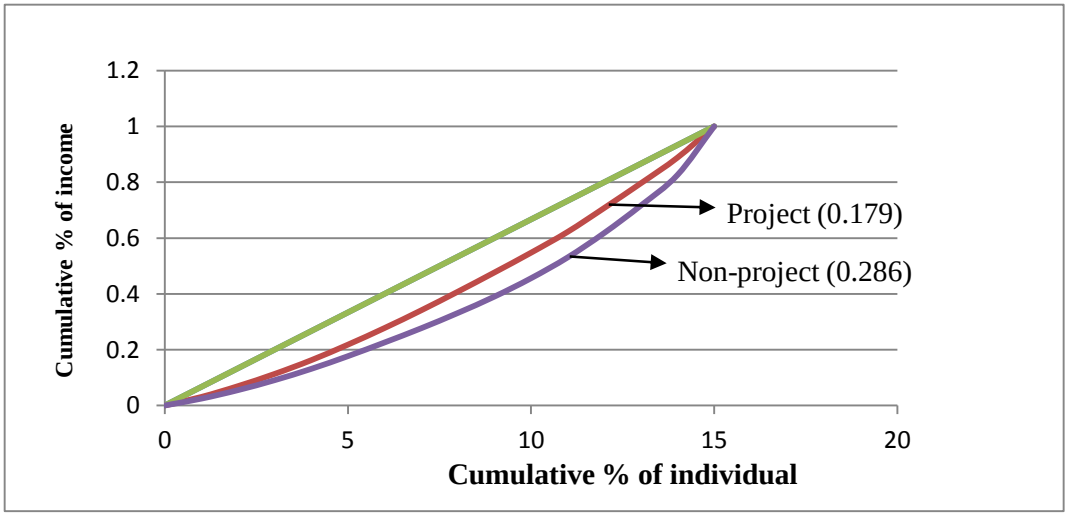

Figure 1. Gini coefficient of project and non-project farmers

Employment pattern on yearly basis for farm households

The labour hour spent by both men and women has increased in the research sites. Male (i.e., husband, son, hired labour) spent more time than their female (i.e., wife, daughter, etc.) counterpart in the field. The average working hours/day for respondent was 2.1 and 1.7, respectively for project and non-project farmers (Table 4). The highest employment duration for respondents was 106.0 man-days/year for the project farmers and for non-project farmers, it was 52.0 man-days/year. The average wage rate of the project and non-project farmers were found different based on farming systems. In case of project farmers, the average wage rate was Tk. 237.5, per day for respondents whereas for non-project farmers, it was Tk. 227.5.

Table 4. Employment pattern on yearly basis for farm households for project and non-project farmers

Activities (Average)	Working hours/ day				Duration (man-days/year)				Wage Tk /day			
	Self	Wife/ husband	Son/ daughter	Hired labour	Self	Wife/ husband	Son/ daughter	Hired labour	Self	Wife/ husband	Son/ daughter	Hired labour
Project farmers												
Farm	2.1	1.15	1.7	1.1	106.0	28.2	55.8	40.8	237.5	175.0	210.0	242.5
Non-project farmers												
Non-farm	1.7	1.0	1.42	0.8	52.0	25.8	28.2	27.8	227.5	162.5	207.5	227.5

Source: Field survey, 2015.

Table 5 reveals that overall employment opportunities were increased significantly at 1% level by the duration of 22 to 36 man-days for the project farmers compared to non-project farmers which were 19 to 21 man-days. Therefore, it can be concluded that intervention of different institutes, i.e., BRDB, DAE, VDO, RDA, etc. on agricultural activities has positive and significant impact on farmers' employment creation and income generation.

Table 5. Impact on farmers' employment creation (man-days)

Matching method and outcome	Project farmers			Non-project farmers		
	Average treatment on treated (ATT)	Standard error	t value	Average treatment on treated (ATT)	Standard error	t value
Kernel matching	22	9.3	2.36***	19	6.9	2.02***
Radius matching	36	11.1	3.24**	21	8.7	1.89***

Source: Authors' estimation, 2015.

Note: ***Significant at 1 percent level; ** Significant at 5 percent level; and

* Significant at 10 percent level.

Impact of 'one house one farm' approach on livelihood status

Livelihood status: food security indices

The household daily calorie intake is obtained from the questionnaire and from there the quantity of food consumed by the household is estimated over a 28 days period. Per capita calorie intake is calculated by dividing the estimated total

household calorie intake by the family size of the project and non-project farmers after adjusting for adult calorie intake equivalent. For project farmers, index value obtained for the mean food security status of secure households was 1.15 and 0.93 for food insecure households. For non-project farmers, index value obtained for the mean food security status of secure households was 1.08 and 0.82 for food insecure households (Table 6).

Table 6 shows that the head count ratio (H) was 0.64 which indicates that 64% households were food secure and 36% were food insecure for project farmers, whereas, 45% and 55% for non-project farmers, respectively in the study areas. Per capita daily calorie availability for food secure households was higher than the national average of 2122 Kcal for both group of farmers. These values compared with a calculated shortfall index of 0.001 and surplus index of 0.003 imply that the food insecure households fell below the food security line by about 0.1% and the food secured household exceeded the food security line by 0.3%. On the other hand, for non-project farmers, it was 0.004 and 0.002 indicate that the food insecure households fell below the food security line by about 0.4% and the food secure household exceeded the food security line by 0.2%.

Table 6. Food security indices for project and non-project farmers

Farming system	Food security indices	Food secure households	Food insecure households	All
Project farmers	Food security index	1.15	0.93	1.05
	Head count ratio	0.64	0.36	
	Per capita daily calorie availability (kcal)	2443.578	1986.525	2215.05
	Food insecurity gap/Surplus index	0.003	- 0.001	-
Non-project farmers	Food security index	1.08	0.82	0.95
	Head count ratio	0.45	0.55	
	Per capita daily calorie availability (kcal)	2295.919	1742.463	2019.19
	Food insecurity gap/Surplus index	0.002	- 0.004	-

Source: Authors' estimation, 2015.

Livelihood status: livelihood framework

Livelihood pattern can be measured by presenting the assets in a framework which is known as asset pentagon. Asset pentagon is composed of five types of capitals namely human capital, social capital, natural capital, physical capital and financial

capital (DFID, 2000). Table 7 shows that the access on human capital for project farmers was increased by 29.5% due to the adoption of 'one house one farm' approach. Meanwhile, the access on human capital for non-project farmers was increased only 15% which is lesser than project farmers. But, the situations of non-project farmers were more or less unchanged (23.5%).

Table 7. Distribution of livelihood capital of the sample farmers

(in percentage)

Asset categories	Increased		Decreased		Constant	
	Project farmers	Non-project farmers	Project farmers	Non-project farmers	Project farmers	Non-project farmers
Human capital	29.5	15.0	6.0	6.5	9.5	23.5
Social capital	25.7	15.0	4.0	11.0	15.3	19.0
Natural capital	9.0	6.3	7.6	12.0	28.3	26.6
Physical capital	18.3	6.5	4.0	6.5	21.5	25.6
Financial capital	22.3	7.7	4.6	15.7	18	21.0

Source: Authors' estimation, 2015.

The social capital of project farmers was increased by 25.7% after the adoption of 'one house one farm' approach. Majority of the non-project farmers' access of social capital was more or less constant and it was 19% (Table 7). Overall natural capital access by the project farmers was constant which was 28.3% and majority of the non-project farmers also had constant access to different types of natural capital which was 26.6% (Table 7). The total access of physical capital was increased by 18.3% while it was 14.7% for non-project farmers. The access on financial capital for project farmers was increased. The capital was increased by 22.3% which covered majority of the project farmers where it was 7.7% for non-project farmers.

Livelihood status: sustainable livelihood approach (SLA)

A sustainable livelihood framework has been built for the study area following the sustainable livelihood approach (SLA) referred by DFID. While having this framework, the farmers were taken into account as this will suit for them most and the ultimate goal of SLA can be achieved by offering a sustainable livelihood strategy from study area point of view.

Table 8. Sustainable livelihood framework for farmers in the study areas

Capital	Assets	Vulnerability	Direct measure	Indirect measures (Structure and processes)	Livelihood strategy	Livelihood outcomes
Human	Training	Unskilled trainer	Monitoring by the higher authority	DAE, BRDB; Creating more facilities for training	Human resource development strategy	Skilled personnel
	Knowledge/ efficiency	Unskilled personnel				
Social	Self-managerial capability	Disfavourable condition	Involve the social elite persons and conversation with them	Local people, GO and NGOs; Awareness building	Creating cooperation	Relationship of trust
	Social access/ Network	Social prejudice (specially for women)				
	Involved in social group	Social constraints				
Natural	Cultivable land	Confliction	Wise use of natural resources	LGED; Awareness building	Campaign	Healthy environment
	Forests	Deforestation				
	Open water resources	Pollution				
Physical	Building	Damaged by disaster	Intensive supervision by higher authority	Go and NGOs interference; Awareness building	Introducing modern technology	Improved standard of living
	Tube well	Dishonest authority				
	Radio/TV	Disruption in electricity				
	Mobile phone	High price				
	Sanitation	Unconsciousness				
	Furniture	High price				
Financial	Cash in hand	Theft	Creating Awareness	Bank; Setting insurance services	Income generating activities	Food security and savings
	Cash at bank/ Savings	High interest rate				
	Donation/Grant /Aid	Not accessible timely				

Source: Authors' estimation based on field survey, 2015.

Table 8 shows the framework in this study for project farmers group and non-project farmers group. Some suitable indirect measures for the study areas have been proposed which will be undertaken by the local and government agencies. These two

will protect the assets from the different threats and shocks and increase the farmer's access to assets. At the same time, some sustainable livelihood strategies have been worked out so that the people can continue with their livelihood overcoming shocks and stresses to achieve livelihood outcomes such as food security, good health, etc. Some farmers reported that major vulnerability of keeping cash in hand on financial capital was theft. By creating awareness as direct measure and by the help of bank as well as insurance service as indirect measure would remove the vulnerability suggested by the farmers. As a result, they would use their money for other activities and would be food secured ultimately.

Problems and probable solutions

To find out the problems faced by the farmers in adopting 'one house one farm' or not adopting 'one house one farm' approach two focus group discussions (FGDs) were done in three unions Bhabkhali, *Char* Ishwardia and *Char* Nilakshmia. From the FGDs 13 problems were identified. Those problems were grouped in to five categories such as training, credit, Support and service, marketing and social problems. In the study areas, farmers were adopting 'one house one farm' approach by the help of BRDB taking 2 or 3 days training out of 7 days training in one month. About 17.8% and 8.8% project farmers and non-project farmers informed reported on this problem, respectively. Farmers' access to credit is one of the major problems in rural areas. Nearby, 44.5% of project farmers and 51.3% non-project farmers conveyed about the credit related problem.

Table 9. Problems and solutions of the 'one house one farm' approach in the selected regions of Mymensingh district

Items	Project farmers		Non-project farmers	
	No. of respondents	Percentage (%)	No. of respondents	Percentage (%)
Problems				
Training related problems	8	17.8	4	8.8
Credit related problems	20	44.5	23	51.3
Support and service related problems	6	13.3	7	15.5
Marketing problems	7	15.5	4	8.9
Social problems	4	8.9	7	15.5
Total	45	100.0	45	100.0
Probable Solutions				
To provide training by skilled officials	9	20.0	8	17.8
To provide sufficient amount of loan with easier procedure and	18	40.0	23	51.1

lower interest rate				
To provide scientific knowledge and extension services timely	8	17.8	7	15.6
To improve marketing facilities	7	15.5	4	8.8
To build up farmers' cooperative and ensure political stability	3	6.7	3	6.7
Total	45	100.0	45	100.0

Source: Authors' calculation, 2015.

Farmers, in the study areas, were practicing the 'one house one farm' approach for meeting up the family needs as well as involved in subsistence farming. Some specific marketing related problems were faced by the farmers in the study areas. About 15.5% project farmers reported on this problem while it was 8.9% for non-project farmers. Social problems associated with agriculture cannot be separated from external social pressures. Occasionally, farmers have to face such type of problem. Due to political boundary, farmers were deprived from loan which was provided by BRDB to practice the 'one house one farm'; although, the provision of the project was to give loan to the farmers unanimously. About 8.9% project farmers confronted on this problem while it was 15.5% for non-project farmers.

Table 9 also shows that both categories of farmers suggested some suggestions about the above problems. Both project and non-project farmers suggested that training should be provided by skilled officials, loan disbursement process should be changed and made an easy way and minimum interest rate to get loan. The support and services are specifically needed for the landless and marginal farmers to increase their agricultural productivity. Farmers also suggested for improving their marketing facilities and building up farmers' cooperative and ensuring political stability so that they can improve their livelihood status as well as reduce the poverty from root level.

CONCLUSIONS AND POLICY RECOMMENDATIONS

'One house one farm' approach is a unique initiative in addition to the common help to the small farmers by the government. Need-based investments to the family farming ensure food production, improve livelihood and enhance income which ultimately lead to reduce poverty. The adoption of 'one house one farm' approach helped the farmers to increase their farm income by practicing different farming enterprises. Sex distribution, family size, training exposure and farm income have positive and significant impact on the adoption of this project. 'One house one farm' project farmers got more opportunities to improve their economic condition and livelihood status through diversified income generating activities than non-project farmers. In some cases, they got training but no credit facilities and some farmers got

credit and technical support without training. The farmers also reported the probable solutions to get rid of those problems. The vision of Bangladesh government for being middle income country by 2021 would be achieved to some extent if the project works properly. If the 'one house one farm' project can be implemented successfully, this model would be a universal and ideal practice of poverty reduction for the poor particularly in developing countries.

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