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Indigenous women participation behavior under 'one house one farm' project of Mymensingh in Bangladesh

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Abstract

The study was conducted to assess the participation behavior of indigenous women by the adoption of 'one house one farm' project in Mymensingh district. The respondents were divided into two groups i.e., project farmers and non-project farmers. The study revealed that the impact of the project was very much satisfactory in terms of education, occupation, farm holding, etc. The participation index was used as a measure of women's participation level in the 'one house one farm' which indicated that 88.0% of the project women obtained a score of 60.0. The results also revealed that the age of the head of households, numbers of trainings imparted to each household, operational holding, frequency of the visit of BRDB personnel, effectiveness of local institutions and off-farm income had significant influence on the participation behavior of the indigenous women. Although, indigenous farmers reported some strengths and opportunities which helped them to cope with the unwanted situation, government and the concerned authorities should come forward to overcome the weaknesses and threats as well.

Key words: Indigenous households, socioeconomic impact, participation behavior

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Introduction

Since the last decade, the issues regarding livelihood of indigenous ethnic groups have been demanding increased attention by the government and international communities for their social, economic and cultural emancipation. Most of the indigenous people are engaged with such income-generating activities which do not carry a high economic standard. Within the indigenous communities, women often represent the most disadvantaged category. Most of the indigenous women are deprived of basic human rights to food, health, education, intellectual property rights, culture, dignity and peace. The crucial role of indigenous women in rural poverty reduction and sustainable development has recently received the attention in the development arena.

Bangladesh Rural Development Board (BRDB) implemented 'one house one farm' (OHOF) approach for building a new dimension to reduce poverty and to enhance women empowerment status through improvement of financial condition of the indigenous communities. The intrinsic goal of the OHOF project is to reduce national poverty level to 20% from 40% through developing each of the houses as a unit of agro-economic activities. Through effective training, indigenous people especially, women are more likely to acquire up-to-date knowledge on this project and refresh their existing knowledge.

'One house one farm' approach is also considered as an important option to improve the status of the household

members of the indigenous community because of shortage of land. Once the households have access to credit, they are being prepared to maneuver to get advantage by their economic empowerment. They are trying their best to earn more to build and expand their capital base as well as improve their quality of life. Under this project, each house will be converted into an identical economic unit. It would be a medium of income which will develop digital Bangladesh free from hunger and poverty.

The proposed study will present an updated status of the homestead based resources managerial capabilities of small indigenous farmers, women empowerment, participation behavior and decision making process of small-scale farming in order to improve their socioeconomic condition. The objectives of the study are to determine the impact of 'one house one farm' project on participation behavior of indigenous women and to address the problems faced by them and suggest policy options.

Materials and Methods

Two upazilas (i.e., Bhaluka and Muktagacha) of Mymensingh district were purposively selected where the indigenous people were involved with 'one house one farm' project. The respondents were divided into two groups: project farmers (those who are involved with this project) and non-project farmers (the farmers who are not involved with the project activities). Total 120 sample farmers (i.e., 60 project farmers and 60 non-project farmers) were interviewed following random sampling technique. To collect primary data from sample farmers, field survey method was applied using pre-tested questionnaire and focus group discussions (FGD) were conducted for group information, and cross-check the data and information.

Descriptive statistics (i.e., sum, average, percentages, ratios, etc.) were used in order to identify the socioeconomic profile of the indigenous households. To determine the women participation behavior, participation index was used. Individual activities of women were considered to assess the extent of participation in the project. Participation index of each female respondent was calculated using the following formula:

$$PI_i = \frac{\sum_{j=1}^{n} Y_j}{n} \times 100$$

Where, PI_i = Participation index for the i^{th} female respondent; Y_j = 1, if the respondent has participated in the j^{th} activity, and 0, if the respondent has not participated in the j^{th} activity; and n = Total number of activities taken up in the study areas.

Tobit analysis was used to identify the socioeconomic, psychological and institutional factors that influence a woman's participation decision. The details of explanatory variables used in the analysis are given in Table 1.

A model for participation is specified as: $PI = b¢X + e^*$

Where, PI = Participation index ($PI = PI^*$ if $PI^* > PI_0$, and $PI = 0$ if $PI^* = PI_0$; PI^* is the solution to utility maximization problem of the level of participation subject to a set of constraints per household and conditional on being above a certain limit PI_0, which is the minimum level of participation of a respondent, and $PI_0 = 0$ for those not participating in any project); b¢ = Vector of parameter values; X = Vector of regressing variables; and e* = error-term.

Following Tobin (1958), the expected level of women participation is expressed as: $E(PI) = X_bF(z) + sf(z)$

Where, E(PI) = Expected level of women participation; b = Vector of Tobit maximum likelihood estimates; X_b = Vector of explanatory variables; z = Z-score for the area under normal curve; F(z) = Cumulative normal distribution of z; f(z) = Value of the derivative of the normal curve at a given point (i.e., unit normal density); and s = Standard error of the error term;

According to McDonald and Moffitt (1980), the marginal effect of an explanatory variable on the expected value of the dependent variable can be explained by: $dE(PI)/dX_i = F(z)b_i$

SWOT analysis was done to identify the farmers' problems and potentials regarding OHOF activities and suggestions provided by the farmers for expanding the activities of 'one house one farm' project were synchronized for policy options.

Table 1. Factors affecting farmers' decision to participate in the project

Variables	Description	Unit	Expected sign
AGE	Age of the household head	Years	(-)
EDU	Education of the household head	Years	(+)
TRAINING	Number of trainings imparted to members of the household	Number	(+)
OHOLDING	Operational holding hectare	(Ha)	(+)
OFFINCOM	Off-farm income	Yes =1; No = 0	(-)
LIVESTOC	Livestock including pig	Number	(+)
FAMILYSI	Family size	Number	(-)
VEXT	Frequency of visiting the BRDB personnel	At least once a month = 1; Otherwise = 0	(+)
RULE	Fixed rule for sharing of benefits from common resources	Yes = 1; Otherwise = 0	(+)
EFFECTIN	Local institution(s) is functional	Yes =1 ; Otherwise = 0	(+)
PEMLOY	The project leads to more employment	Yes = 1; No = 0	(+)
PYIELD	The project leads to increase in yield	Yes = 1; No = 0	(+)

Source: Authors' estimation, 2016.

Results and Discussion

Socioeconomic characteristics of the sample Farmers: Table 2 depicts that average family size of project farmers was 4.01 and non-project farmers were 3.48. The indigenous people under the project had an average farm size of 0.57 hectare while non-project farmers had an average farm size of 0.48 hectare. Among the surveyed respondents, male and female respondents were 60.0% and 40.0%, and 65.0% and 35.0% in stare of project and non-project farmers, respectively. Majority (35.6%) of the project farmers' family members belonged to 15 to 55 years while 36.3% members were belonged to this category for non-project farmers.

Table 2 showed that project farmers' literacy level was higher in graduate and above level than non-project farmers i.e., 12.0% and 9.1%, respectively. Project farmers' education was satisfactory enough than non-project farmers. Most of the family members of project farmers were engaged in multiple occupations and they assisted each other in their works. The main occupation of the project farmers was day labourer (21.6%) where for non-project farmers, it was van/rickshaw pulling (20.0%).

Loan usage by the respondent farmers: Project farmers received loan from BRDB office and local money lenders. But the non-project farmers received loan from different NGOs like Grameen Bank, Proshika, Asha, etc. It is evident from Table 3 that in case of project farmers, 31.2% of received loan was used for pre-harvest crop production which was followed by post-harvest crop production (20.3% loan) and livestock rearing (18.3% loan). For non-project farmers, 29.4% credit was used for pre-harvest crop

production which was followed by post-harvest crop production (22.0% loan) and livestock rearing (21.9%).

Participation behavior of indigenous women in different activities: Participation behavior of indigenous women was mainly measured by three dimensions which are: participation in agricultural activities, participation in decision making activities and participation in household activities.

Participation in agricultural activities

***Pre-harvest crop production*:** Table 4 reveals that before taking the loan, 66.0% project and 63.3% non-project women were involved in the pre-harvest crop production which included budgeting for crop production, purchasing agricultural inputs, arrangement of agricultural implements, selection of land, selection of crop, land preparation and cleaning, sowing seed/transplanting seedling, weeding, irrigation, intercultural operation, determination of harvesting time and harvesting of crop. After taking the loan, 74.0% project and 68.1% non-project women were engaged with the following activities.

***Post-harvest crop production*:** Table 4 represents that 49.1% and 46.8% project and non-project women, respectively played vital role in threshing, cleaning and winnowing of harvested crops before receiving the loan. After receiving the loan, the figures became 53.9% and 48.8% for project and non-project women, respectively.

Table 2. Socioeconomic profile of the farmers

Particulars		Project farmers		Non-project farmers	
		No. of farmers	% of farmers	No. of farmers	% of farmers
Average family size (no.)		4.01		3.48	
Average farm size (Acre)		0.57		0.48	
Sex distribution	Male	36	60.0	39	65.0
	Female	24	40.0	21	35.0
Age distribution of farmers' family members (years)	Below 5.00	23	14.7	32	15.4
	5.01-15.00	40	25.4	51	24.4
	15.01-55.00	57	35.6	76	36.3
	Above 55.00	39	24.3	50	23.9
Literacy level of the household head	Illiterate	13	21.5	11	18.9
	Sign only	18	29.4	16	26.4
	Primary	10	16.4	18	30.7
	Secondary	7	11.3	5	7.8
	Higher secondary	6	9.4	4	7.1
	Graduate and above	7	12.0	5	9.1
Occupational status	Housewife	8	13.6	3	5.0
	Agriculture	6	10.0	11	18.4
	Shopkeeper	9	15.0	10	16.6
	Labour	13	21.6	11	18.3
	Van/rickshaw pulling	8	13.3	12	20.0
	Others	16	26.5	13	21.7

Source: Field survey, 2016.

Table 3. Loan usage by the respondent farmers (in percentage of loan)

Major areas of loan use	Project farmers	Non-project farmers
Pre-harvest crop production	31.2	29.4
Post-harvest crop production	20.3	22.0
Livestock rearing	18.3	21.9
Fish culture	8.0	7.5
Homestead and agroforestry production	11.4	10.7
Decision making activities	5.1	4.8
Household activities	3.5	2.5
Others	2.2	1.2

Source: Field survey, 2016.

***Livestock rearing*:** Information presented in Table 4 indicates that 51.4% project and 49.2% non-project women participated in purchasing and rearing of goat and pig before taking the loan whereas after taking the loan, the percentages were 72.0 and 57.1 respectively.

***Homestead and agroforestry production*:** Activities related to homestead and agroforestry production include budget allocation, arrangement of inputs and agricultural implements, land preparation, crop production, monitoring, harvesting, etc. It has been found that 33.4% and 31.9% project and non-project women, respectively were engaged to these activities before receiving the credit and after receiving the credit, the figures are 41.0% and 37.5% respectively.

Participation in decision making activities

***Decision about agricultural production*:** The decision making power over the input in productive use and autonomy in production was available to 39.5% project and 38.4% non-project women before receiving the loan whereas, it became 48.6% and 45.9%, respectively after receiving the loan.

***Access to productive resources*:** Table 4 reveals that 50.0% project and 62.5% non-project women had decision making power over the ownership and purchase, sale or transfer of assets before taking the credit. After taking the credit, 56.6% project and 77.2% non-project women had access to these assets.

Table 4. Comparative participation of project and non-project women in different activities

Activities		Project women's participation (%)		Non-project women's participation (%)	
		Before	After	Before	After
Agricultural activities	Pre-harvest crop production	66.0	74.0	63.3	68.1
	Post-harvest crop production	49.1	53.9	46.8	48.8
	Livestock rearing	51.4	72.0	49.2	57.1
	Fish culture	65.2	79.8	63.3	75.5
	Homestead and agroforestry production	33.4	41.0	31.9	37.5
Decision making activities	Decision about agricultural production	39.5	48.6	38.4	45.9
	Access to productive resources	50.0	56.6	62.5	77.2
	Control over use of income	44.2	55.2	61.6	81.6
Household activities	Food preparation	49.1	55.3	63.2	79.1
	Children's education	43.9	54.1	38.4	48.7
	Housing activities	36.5	66.5	54.2	70.4
	Family planning	41.9	61.4	58.2	70.9
	Intra-household activities	40.1	51.6	57.1	65.7

Source: Field survey, 2016.

***Control over use of income*:** Before receiving the credit, 44.2% project and 61.6% non-project women had decision making power over the permission of earning and control over income and after receiving the credit, the percentage became 55.2% and 81.6% for project and non-project women, respectively.

Participation in household activities

***Food preparation*:** In most of the houses, women prepare the daily food items. Sometimes their husbands and children help them. Activities related to preparation of daily food items include selection of daily menu, budgeting for food items, buying food items, cooking food and washing dishes. It is seen from Table 4 that 49.1% and 63.2% project and non-project women, respectively were involved in these activities before receiving the credit and after receiving the credit, the figures were 55.3% and 79.1%, respectively.

***Children's education*:** Table 4 reveals that before receiving the loan, 43.9% of the project and 38.4% of the non-project women played vital role to select the children's school, spend money for education, assist in going school, select private tutor and take care at home. After receiving the loan, the figures became 54.1% and 48.7% for project and non-project women, respectively.

***Housing activities*:** Housing activities point to purchasing land to build house, building of house, selection of household furniture, repairing house, etc. About 37% project and 54% non-project women were engaged to these activities before receiving the credit and after receiving the credit, 66.5% and 70.4% project and non-project women, respectively were engaged to these activities.

***Family planning*:** Findings compiled in Table 4 indicates that 41.9% project and 58.2% non-project women were participating in selection of family planning method, determination of reproduction time, naming of children, etc. before taking the loan whereas after taking the loan, 61.4% and 70.9% of them participated in these activities, respectively.

***Intra-household activities*:** Before taking the loan, 40.1% project and 57.1% non-project women did different intra-household activities like managing household budget, financial investment, inviting and entertaining guests, visiting relatives and friends, and so on. The percentages of women became 51.6% and 65.7% after taking the loan for project and non-project category, respectively for the stated activities.

Factors affecting overall participation behavior of indigenous women: Participation index was used as an overall measure of women's participation, from which it is seen that 88.0 percent of the female respondents obtained a score of 60.0 or less (Table 5).

Tobit estimates and marginal effects of the participation level indicating significant variables (four out of nine) show significant influence on the participation behavior of the women that have been presented in Table 6. It was found that the participation was positively related to the age of female respondents. It may be so because the older one being more experienced in cultivation could better assess the utility of the technological intervention than the younger one. There is no argument in literature about the direction of the effect of age on adoption, as it is generally location or technology-specific (Adesina and Baidu-Forson, 1995).

Table 5. Participation index indicating women's participation level

Level of participation	Extent of participation (% of farmers)	Cumulative percentage
0-20	45.0	45.0
21-40	16.0	61.0
41-60	27.0	88.0
61-80	11.0	99.0
81-100	1.0	100.0

Source: Authors' estimation, 2016.

The frequency of visit of BRDB personnel and institutional effectiveness showed a positive relationship with women participation (Table 6). The

visits made by the BRDB personnel created mass awareness about the common goal of different technologies. Similarly, institutional effectiveness ensured the sustainable management of common pool resources.

Table 6. Tobit Regression Coefficients and marginal effects for factors influencing women's participation behavior

Variables	Coefficients	Standard error	P-value	Change in probability $dF(z)/dX_i$
CONSTANT	– 0.0617	0.0819	0.452	
AGE	0.0009*	0.0004	0.021	0.0008
EDU	0.0040**	0.0047	0.397	0.0035
TRAINING	0.0412	0.0194	0.034	0.0368
OHOLDING	0.0178	0.0067	0.008	0.0159
OFFINCOM	– 0.0232	0.0110	0.048	– 0.0207
LIVESTOC	– 0.0043**	0.0047	0.362	– 0.0038
FAMILYSI	– 0.0024**	0.0035	0.493	– 0.0021
VEXT	0.0754	0.0361	0.036	0.0674
EFFECTIN	0.2409	0.0404	0.000	0.2153
log likelihood function = –10.1657 (P < .0001)				
Z = 1.2477 F(Z) = 0.8939 f(z) = 0.1849 s = 0.2241				

Source: Authors' estimation, 2016, Note: ***, ** and * indicate significant at 1%, 5% and 10% probability level, respectively.

It was found that training rather than education had significant influence in motivating the female respondents to take action and contribute in the form of labor and/or money. A negative relationship was found between off-farm income and women participation. This may be due to the fact that the number of days they remained involved in off-farm activities, a little time was left to them for being associated with the household or decision making activities (Table 6).

The marginal effect analysis shows that the effectiveness of BRDB personnel had the maximum marginal effect on women participation followed by the visit of BRDB personnel and training. The assured effectiveness of the BRDB increased the probability of women participation by 21.53%. Similarly, with additional training, the probability of women participation was increased by 3.7%. The frequency of visit of BRDB personnel was another significant variable where policy interventions can increase the women participation in such approaches. However, off-farm income sources created disincentive for women participation which may be due to the fact that they had to move out of village in search of work. Therefore, efforts should be made to create off-farm employment opportunities within the indigenous community.

SWOT Analysis on 'One House One Farm' Project Activities: SWOT analysis was done to identify the problems and potentials of 'one house one farm' project activities in the study areas. Table 7 demonstrates that about 65% indigenous people responded that this project helped them how to grow more food by the efficient use of small land. About 34.0% non-project farmers agreed with this point. About 81.0% project and 67.0% non-project respondents reported about lack of introduction of new income generating activities (mostly non-agricultural activities) as the foremost weakness of the project. Approximately, 79.0% and 70.0% project and non-project farmers confronted about the biasness in enlisting the members by the local leaders.

Table 7. SWOT analysis regarding OHOF approach

Strengths	% of responses		Weaknesses	% of responses	
	Project farmers	Non-project farmers		Project farmers	Non-project farmers
Increase in food production	65.0	34.0	Income generation from agricultural activities only	81.0	67.0
Increase in poor farmers income	81.0	19.0	Loan is necessary to be paid back	45.0	60.0
Training provision	72.0	37.0	Farmers cannot be helped the in short duration	74.0	73.0
Motivation provided by field level BRDB agents	58.0	12.0	Untimely training given by unskilled trainer	81.0	71.0
Homestead gardening	85.0	41.0	Insufficient institutional credit	73.0	81.0
Satisfied loan disbursement process	57.0	16.0	Biasness in enlisting the members	79.0	70.0
Opportunities	% of responses		Threats	% of responses	
	Project farmers	Non-project farmers		Project farmers	Non-project farmers
Ensures more financial security	85.0	38.0	Common uncertainties	61.0	34.0
Quality seed from the government	70.0	45.0	Untimely or late loan repayment	58.0	23.0
Barrier to farmers having less than one hectare land cannot	67.0	21.0	Political obstacles due to communalism	86.0	81.0
Credit support to the landless and marginal farmers	72.0	41.0	Unanimous loan disbursement process	70.0	56.0

Source: Field survey, 2016.

Jannat and Uddin (2016) also reported that about 44.5% respondents were not able to enlist their names to get loan under this project. Most of the project farmers (85.0%) reported that diversified product ensured more financial security but only 38.0% non-project farmers said that there were advanced technologies to grow more diversified products and better marketing facilities. About 86.0% and 81.0% project and non-project farmers, respectively reported about the political obstacle as communalism affects their life deliberately. This was because they were minor in number and always faced something unusual (Table 7).

Conclusions and Recommendations

The study concludes that 'one house one farm' project acts as an exceptional ingenuity in addition to the communal help to the indigenous farmers. The extent of participation of tribal women in the study areas was not rigorous. Iindigenous women's participation was measured in this study mainly in three dimensions namely participation in agricultural activities,

participation in decision making activities and participation in household activities where the participation of project female respondents was relatively higher than that of the non-project female respondents. Majority of the project women farmers were empowered as they used resources and time more efficiently than others by which they were able to produce more production and earn more money income. In order to implement the project successfully, the extension activities need to be strengthened to give support to the indigenous households for the adoption and practice of 'one house one farm' approach.

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