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## **Rural Women's Participation in Boosting Homestead Vegetable Cultivation in Moulvibazar District**

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### **Authors' contributions**

*This work was carried out in collaboration among all the authors. In particular, author MRA designed and supervised the study while author MAI play major role in data interpretations and discussions. Author SDB managed the literature searches and collected necessary data. Author JF performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. All authors read and approved the final manuscript.*

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### **ABSTRACT**

The main purpose of the study was to determine the extent of participation of the rural women in homestead vegetable cultivation in two villages namely Esubpur and Noagaon of Bhunobir union of Sreemangal upazila under Moulvibazar district. Data were collected from randomly selected 100 rural women by using a pre-tested interview schedule during the period from 10 January to 22 February, 2018. The extent of participation was measured by using a five-point rating scale. Results revealed that, 75% of the respondent had medium participation in homestead vegetable cultivation as compared to 21% low participation and 4% high participation. Participation in irrigation and drainage among all other activities required for homestead gardening ranked first that might have an impact in boosting vegetable cultivation. Some socio-economic characteristics of the respondent rural women like educational level, farm size, annual family income, cosmopolitaness, extension media contact, knowledge, attitude and training experience had a significant positive relationship with their extent of participation in homestead vegetable cultivation. Need-based training program

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depending on the varied socio-economic background of rural women will help in boosting vegetable cultivation in the vegetable scarce Moulvibazar district, and rural women may find homestead gardening as the core income generating activity.

*Keywords: Participation; rural women; homestead area; vegetable cultivation; gender gap.*

## 1. INTRODUCTION

Bangladesh is basically an agricultural country. The economy of Bangladesh is largely dependent on agriculture. Bangladeshi women play a significant part in agriculture production. Although rice is the dominant crop, vegetable occupies a very important place in rice-based cropping systems and plays a distinct role in the crop sub-sector to provide nutrition, enhances food security and uplifts economic benefits to the producers. Vegetables are essential in the diet, provide fiber and trace minerals, vitamins, carbohydrates and proteins. Vegetables help to prevent various diseases resulting from malnutrition and unbalanced nutrition.

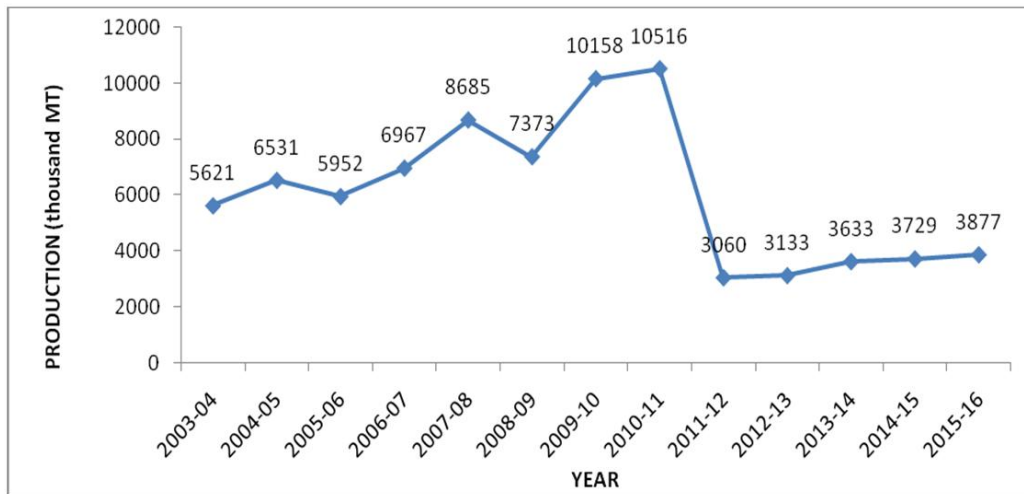
Homestead has special significance in the context of Bangladesh where about 62 per cent of farmers are landless. Homestead agriculture may be a lifeboat for their survival and existence because of a secured supply of food, petty cash etc. In poor countries like Bangladesh, household food production is essential in providing high quality carbohydrates and micronutrients that cannot be purchased by low income families. In Bangladesh, about 64.96% of the population lives in rural areas [1] while there are about 14.4 million households of which 12.7 million exists in rural areas. The size of homestead varies with the class of farmers and it ranges on an average from 0.004 to 0.08 hectare. But approximately 56% of the households have only 0.004 to 0.04 hectare of homestead land [2].

In Bangladesh, 50% of the population is women while 45.6% are associated with the farming activities [3]. The role of rural women in the socio-economic development of Bangladesh cannot be overlooked. In a developing country like Bangladesh, it cannot be denied that underutilized rural female force forms a vast reservoir of human resources. They constitute a large and potential section of its total population. But women have a little opportunity to participate in agricultural activities outside their homes. Though women account for 43% of the agricultural labor force in developing countries and slightly more than 30% in South Asia and India [4]; their access to productive resources

(such as land and livestock), inputs (fertilizers and improved seeds), and services (credit, extension) for agriculture reflects a "gender gap" that most often is rooted in social norms specific to a given geography and culture. Vegetable cultivation in their homestead area acts as a major economic support and way of empowerment to the rural women. Thus they also can play a significant and crucial role in agricultural development as well as home development.

The total production of vegetable during the period from 2003-04 to 2015-16 is shown in Fig. 1 that explains the gradual decreasing trend of vegetable production in Bangladesh. Considering the importance of homestead level vegetable cultivation activities both from the economic and nutritive point of view, the present study has been undertaken to evaluate a true picture on rural women's nature and extent of involvement in vegetable production activities that would be of high importance for gender sensitizing agricultural extension services in Bangladesh.

Participation of rural women is necessary for the success of most of the farming activities. Though, the participation of women in the agricultural sector has increased over time, [5]; their enhanced economic role has not gone in hand with substantial improvement in education, training, health and nutrition and access to production resources and services. Similarly, they remain largely unrepresented in national agenda setting and resources allocating bodies. Their wider participation in village associations, marketing, co-operatives and other community organizations can help in reducing the social constraints on the access to productive resources. It is essential, therefore, that women become a priority target group in agricultural production. Through the participation process, women can learn how to change their living status in personal, social and economic domains. Hence, rural women generally involve in different enterprises but have not been clearly defined so far, since there is no systematic research investigation in these aspects. Very few empirical researches were conducted on this issue.



**Fig. 1. Trend of total vegetable production in Bangladesh**

Source: Field survey, 2018

Considering the above viewpoint the study was undertaken to identify the following objectives:

- i. Assess the extent of participation of rural women in boosting homestead vegetable cultivation.
- ii. Describe some selected characteristics of the rural women in homestead vegetable cultivation.
- iii. Explore relationships between the selected characteristics of rural women and their extent of participation in homestead vegetable cultivation.

## 2. MATERIALS AND METHODS

The study was carried out in two villages namely Esubpur and Noagaon of Bhunobir union in Sreemangal Upazila under Moulvibazar district. Data were collected from 100 randomly selected women through a personal interview by using pre-tested interview schedule from 10 January to 22 February 2018. The extent of participation of a respondent was measured on the basis of the response of the respondents about five different aspects of homestead vegetable gardening namely land selection and preparation, plant nutrient management, pest management, irrigation and drainage and cultural operations. For each aspect a score of 4 was given for the answer regular participation, 3 for often, 2 occasional, 1 rare, and 0 for never. In this way, participation scores of the respondents varied from 5 to 18 against the possible range 0 to 20. For a better understanding of overall participation of rural women in homestead vegetable

cultivation, a Participation Index (PI) was computed using the formula.

$$PI = \frac{(P_{np} \times 0) + (P_{rap} \times 1) + (P_{op} \times 2) + (P_{fp} \times 3) + (P_{rp} \times 4)}{5}$$

Where,

PI = Participation index

$P_{np}$  = Percentage of rural women who never participated

$P_{rap}$  = Percentage of rural women who participated rarely

$P_{op}$  = Percentage of rural women who participated occasionally

$P_{fp}$  = Percentage of rural women who participated often

$P_{rp}$  = Percentage of rural women who participated regularly

Collected data were compiled, coded, tabulated and analyzed in accordance with the objectives of the study. Various statistical measures such as frequency counts, percentage distribution, average, and the standard deviation were used in describing data. SPSS (version 16) computer program was used for analyzing the data. The categories and tables were used in describing data. For determining the relationships between selected characteristics of the respondents and their participation in homestead vegetable production, Pearson's Product Moment Correlation Co-efficient (r) was used. Five percent (0.05) and one percent (0.01) level of probability were used as the basis for rejecting or accepting any null hypothesis.

### 3. RESULTS AND DISCUSSION

#### 3.1 Participation of Rural Women in Homestead Vegetable Cultivation

The respondents were classified into three categories based on their participation scores as Low participation, Medium participation and High participation using mean and standard deviation. Score for participation in homestead vegetable cultivation could range from 0 to 20. The computed score for participation ranged from 5 to 18 with the mean of 13.87 and a standard deviation of 2.51. The observed result was shown in Table 1.

The production of homestead vegetables provides the household with direct access to important nutrients that may not be readily available or within their economic reach. Home gardening has been shown to be a source of additional income for the household through the sale of garden produce after family consumption. Studies suggest that this additional income is generally utilized to purchase additional food items, further increasing the diversification of the diet. Women are the main caretakers of the garden, which empowers them, ensures better utilization of the income from the garden for food, and increases family welfare. All these benefits are important contributions towards poverty alleviation.

Jahan [6] found that 52.5% rural women in her study area had medium participation in vegetable cultivation. They involved themselves in both summer and winter vegetable cultivation to fulfil their nutritional demand as well as her family and to improve their lifestyle by making it as an additional income source.

Rahman [7] also found that rural women had a great participation in vegetable production to improve their economic status as well as their social status.

Uddin [8] conducted a study among the women of Shariatpur district. He found that 68.63 percent of the respondent had medium and 31.37 percent had low involvement in home gardening practices.

#### 3.2 Comparative Participation of Rural Women in Homestead Vegetable Cultivation

The production of homestead vegetables provides the household with direct access to important nutrients that may not be readily available or within their economic reach. In addition, home gardening increases the diversity of foods, which in turn leads to overall better utilization of nutrients. Vegetables often make other foods more palatable and can lead to overall increase food intake and in their aim to improve the overall quality of the diet, home garden address multiple micronutrient deficiencies simultaneously. Home gardening has been shown to be a source of additional income for the household through the sale of garden produce after family consumption. Studies suggest that this additional income is generally utilized to purchase additional food items, further increasing the diversification of the diet. Finally, home gardening is especially important in overcoming the seasonal availability of foods and promotes household self-sufficiency. Women are the main caretakers of the garden, which empowers them, ensures better utilization of the income from the garden for food, and increases family welfare. All these benefits are important contributions towards poverty alleviation.

The comparative participation of rural women in selected five activities was measured using the Participation Index (PI) formula. Computed Participation Index over selected five items has ranged from 130 to 380 with a possible range of 0 to 400.

**Table 1. Distribution of rural women according to their extent of participation in homestead vegetable cultivation**

Categories	Number	Percent	Mean	Standard deviation
Low participation(up to 12)	21	21.0		
Medium participation(13-17)	75	75.0	13.87	2.51
High participation(above 17)	4	4.0		
Total	100	100		

According to Table 2, it was found that irrigation and drainage in homestead vegetable cultivation are ranked 1<sup>st</sup> with the highest PI score of 380. The next activities which are ranked 2<sup>nd</sup> are feeding cultural operation (PI = 372) and 3<sup>rd</sup> rank to plant nutrient management with a (PI = 284). The 4<sup>th</sup> was land selection and preparation (PI = 221). The last one (5<sup>th</sup>) with the lowest PI score 130 was pest management in homestead vegetable cultivation. It is encouraging that women are participating in all items/operations needed for vegetable cultivation through their level of participation varies with the nature of operations. This might due to the fact that nowadays GOs and NGOs have taken several programs on homestead vegetable cultivation and they are giving emphasis to involve women in vegetable cultivation. Moreover, TV, radio and other mass media are advertising the importance of vegetables that might have brought some changes in their attitude.

Khatun et al. [9] also found that women's participation considering different aspects in relation to vegetable cultivation, tilling by spade was ranked first. In case of the cultivation of fruit trees, the highest proportion (46.60%) of rural women had medium participation and irrigation after planting was in the first position. Agricultural knowledge, attitude and innovativeness had a positive relationship with the cultivation of vegetables. On the other hand, education, family income, cosmopolitaness behavior and attitude had a positive relationship with the cultivation of fruit trees.

Development activities especially with the rural women are unorganized and not based on sound planning. However, women constitute to about 50% of the population and remain at home

as full time custodians undertaking many responsibilities like work at the kitchen, child rearing and maintenance of homestead. They were found to be very busy and active within the limited scope and enough in homestead vegetable cultivation from their own idea for their own consumption though they have not been exposed to modern and improved practices. Participation indices reflected this situation. Effects were limited in the participation of some activities that could have been more improved and effective for modern cultivation. These indicate a great responsibility of the extension agencies at the grassroots to develop women as a new group of clients in extension.

### 3.3 Salient Characteristics of the Rural Women

Individual's behaviour in respect to certain affairs is very complex and at the same time very thrilling phenomenon. There are many interrelated and constituent attributes that characterize an individual and form an integral part in the development of his/her behaviour and personality. Besides individual's activity, decision and opinion in respect of certain activity is influenced by certain environmental variables. Such considerations led the researcher to select ten characteristics (Table 3) of the rural women for exploring their relationship with their participation. The highest proportion (40%) of the rural women fell into middle aged category compared to 34% in young aged and only 26% in old aged. In respect of education, more than 70% women were literate (in ranged from primary to higher secondary). It was revealed that the literacy rate of the study area was found to be more than average national literacy rate. This is very much positive in respect of the adoption of

**Table 2. Comparative participation of rural women in 5 activities related to homestead vegetable cultivation with indices and rank order**

Activities	Items	Extent on participation					PI	Rank
		Regularly	Often	Occasionally	Rarely	Never		
Participation in homestead vegetable cultivation	Land selection and preparation	2	28	60	9	1	221	4 <sup>th</sup>
	Plant nutrient management	19	51	25	5	0	284	3 <sup>rd</sup>
	Pest management	0	6	26	60	8	130	5 <sup>th</sup>
	Irrigation and Drainage	83	14	3	0	0	380	1 <sup>st</sup>
	Cultural operation	76	20	4	0	0	372	2 <sup>nd</sup>

improved homestead vegetable cultivation. Most of the respondents (46%) have medium sized family compared to 44% small and 10% large sized family. In respect to farm size of rural women, 44% fell into the small category, 39% into medium and 15% into a large category and 2 percent in the large category. The annual income of the rural women was low (74%) compared to medium (14%) and very low (12%). It is assumed that through homestead vegetable cultivation they can increase their annual income. The majority (75%) of the rural women fall into medium to high cosmopolitaness category compared to 23% in the low category and 2% in no cosmopolitaness category. The majority (64%) of the rural women had medium extension media contact, whereas 23% had low and only 13% had high extension media contact. The majority (56%) of the rural women had low training experience compared to 43% had no training experience and only 1% had medium training experience. With regard to agricultural knowledge, an overwhelming majority of women (74%) had agricultural knowledge ranging from the medium (67%) and high (7%). In respect to attitude, most of the respondent (82%) had moderately favorable attitude compared to 11% had less favorable and only 7% highly favorable attitude.

Ahmad et al. [10] reported that the personal characteristics showed that majority of respondents were in age group of 20–40 years, 54% of the total respondents were educated, 73% of the respondents had barani type of land. Education and adoption of vegetable growing practices were positively correlated. The results further showed that 54 percent of the respondents grew vegetable inside their houses, among which 47.5% grew vegetable for profit purpose and 47 percent of the female respondents grew vegetables themselves. Major constraints in vegetable production found in the study were lack of capital, credit availability and lack of marketing facilities.

### **3.4 The Relationship between the Characteristics of the Rural Women and Their Participation**

This section deals with the relationships of the ten selected characteristics of the rural women (independent variables) with their participation in homestead vegetable cultivation (dependent variables). Pearson's correlation coefficient was used to determine the relationships between the selected independent and dependent variables (Table 4).

Educational qualification, farm size, annual family income, cosmopolitaness, extension media contact, agricultural training experience, knowledge on homestead vegetable cultivation, attitude towards homestead vegetable cultivation of rural women had a statistically significant relationship with their participation in homestead vegetable cultivation while age and family size of the rural women had a non-statistically significant relationship with their participation in homestead vegetable cultivation.

Education makes human beings great, wise and honourable. Education is regarded as an instrument of change and transformation of society. As educated women, they acquire a base of critical thinking and independent judgment. Educated women are less content to devote themselves exclusively to domestic tasks and interested in outside activities [11]. It is an important key to improve health, nutrition, and family education and to empower women to participate in decision making process. Large farm size encourages housewives to participate in homestead agriculture as well as homestead vegetable cultivation. Higher annual income encourages the households to invest more money in different homestead agriculture. Cosmopolitaness helps to broaden up rural women's' thinking and their attitude, behaviour towards homestead agriculture. Extension media contact makes the opportunity to learn about the advantages of homestead agricultural activities and the rural women get the concern about different new practices. Different agricultural training spread new practices and technologies towards rural women and makes them interested in homestead agriculture. If a woman has highly agricultural knowledge, she can easily use improved technology in different homestead agriculture. Attitude implies an individual's predisposition to respond in a characteristic way to some stimuli in her social environment. Innovators are active information seekers about the new ideas. They have a high degree of mass media exposure and their interpersonal networks extend over a wide area, reaching outside their local system [12].

Rahman [13] in her study found that education, family size, farm size had significant positive relationships, family income had non-significant positive relationships and age had a negative significant relationship with the participation of rural women in household and agricultural activities.

**Table 3. Salient features of selected rural women (n=100)**

Character	Category	Rural women		Mean	Standard deviation
		Number	Percent		
Age	Young aged (18 - 35)	34	34.0	41.93	13.329
	Middle aged (36 - 50)	40	40.0		
	Old aged (above 50)	26	26.0		
Educational qualification	Illiterate (0)	3	3.0	5.185	3.575
	Can sign only (0.5)	25	25.0		
	Primary level (1-5)	35	35.0		
	Secondary level (6-10)	34	34.0		
	Higher secondary level and above (>10)	3	3.0		
Family size	Small family (1-4)	44	44.0	5.63	1.495
	Medium family (5-9)	46	46.0		
	Large family(above 9)	10	10.0		
Farm size	Marginal (up to 0.20)	2	2.0	1.615	1.039
	Small (0.201-1.0)	44	44.0		
	Medium (1.01-3)	39	39.0		
	Large (above 3.0)	15	15.0		
Annual family income	Very low income (up to 50,000)	12	12.0	116454	60295.82
	Low income (51,000-1,80,000)	74	74.0		
	Medium income (1,81,000-2,45,000)	14	14.0		
	High income (above 2,45,000)	0	0.0		
Cosmopolitaness	No cosmopolitaness (0)	2	2.0	9.05	2.545
	Low cosmopolitaness (1-7)	23	23.0		
	Medium cosmopolitaness(8-12)	71	71.0		
	High cosmopolitaness (above 12)	4	4.0		
Extension media contact	Low extension media contact (up to 10)	23	23.0	14.95	5.327
	Medium extension media contact (11-21)	64	64.0		
	High extension media contact (above 21)	13	13.0		
Agricultural training experience	No training experience (0 day)	43	43.0	0.69	0.721
	Low training experience (1-3 days)	56	56.0		
	Medium training experience (4-8 days)	1	1.0		
	High training experience (above 8 days)	0	0		
Knowledge on homestead vegetable cultivation	Poor knowledge (up to 11)	26	26.0	12.49	1.962
	Medium knowledge (12-15)	67	67.0		
	High knowledge (above15)	7	7.0		

Character	Category	Rural women		Mean	Standard deviation
		Number	Percent		
Attitude towards homestead vegetable cultivation	Less favorable attitude (up to 31)	11	11.0	32.93	1.684
	Moderately favorable attitude(32-35)	82	82.0		
	Highly favorable attitude (above 35)	7	7.0		

**Table 4. Correlation between independent and dependent variables (n=100)**

Dependent variable	Independent variable	Correlation co-efficient (r) values with 98 df	Tabulated value of 'r'	
			0.05 level	0.01 level
Participation of rural women in homestead vegetable cultivation	Age	0.127 <sup>NS</sup>		
	Educational qualification	0.266 <sup>**</sup>		
	Family size	0.108 <sup>NS</sup>		
	Farm size	0.238 <sup>*</sup>		
	Annual family income	0.214 <sup>*</sup>		
	Cosmopolitaness	0.216 <sup>*</sup>		
	Extension media contact	0.282 <sup>**</sup>	0.197	0.257
	Agricultural training experience	0.259 <sup>**</sup>		
	Knowledge on homestead vegetable cultivation	0.258 <sup>**</sup>		
	Attitude towards homestead vegetable cultivation	0.285 <sup>**</sup>		

\* Significant at  $p < 0.05$  level of probability

\*\* Significant at  $p < 0.01$  level of probability

Rahman [7] indicated in his study that training experiences and knowledge on homestead agricultural activities of rural women had a positive significant relationship with their participation in homestead agricultural activities.

Nahar [14] observed in her study that cosmopolitaness of the rural women had no significant relationship and attitude towards homestead agriculture of the rural women had a significant positive relationship with their participation in homestead agriculture.

#### 4. CONCLUSION

Home gardening is a very effective homestead agricultural activity as it helps to get fresh vegetables which provide pure nutrition to one's family. Vegetable production can make an earning source for the rural women and helps to make them empower. The participation of rural women in the study area was not satisfactory as they mostly had medium participation. The analysis shows that women play an important role in vegetable cultivation that helps to meet up the nutritional and agricultural demand of the country. But, most of the women in our country

are not aware of the benefits of vegetable production. They have little idea that how they can improve their situation through this vegetable production. Thus, to meet the ever-growing demand for food, nutrition, there is a need for further enhancements of the rate and extent of participation of rural women in different homestead agricultural activities. Particularly, workers of both Government Organization (GO) and Non-Government Organization (NGO) should provide appropriate technical and management related information to all the rural women of the study area through continued improvements in extension and other support services. Concerned authority should take necessary training and skill development program like training on vegetable cultivation, poultry raising and goat rearing etc. so that the rural women could increase agricultural production in their homestead as well as increasing their family income.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.



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