

# Female Participation in Agriculture of West Bengal: A District Level and Micro Level Analysis

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## **ABSTRACT**

*Female labour force participation rate are also different among the districts of West Bengal. The female labour force participation rate varies from as low as about 1% to as high as about 15%. Female labour participation rate in agriculture in Purulia district is highest followed by Bankura, Paschim Medinipur, Dakhin Dinajpur, Coochbihar, Uttar Dinajpur, Birbhum, Burdwan, Malda, Jalpaiguri, Purba Medinipur, Hooghly and lowest in Howrah district during 1991 to 2011. Female participation rate in agriculture in Purulia district is highest followed by Paschim Medinipur, Bankura, Dakhin Dinajpur, Cooch bihar, Uttar Dinajpur, Birbhum, Malda, Jalpaiguri, Purba Medinipur, Burdwan, Hooghly and lowest in Howrah during this period. We analyze the factors of female participation rate in agriculture like female literacy rate, percentage of area under foodgrain, percentage of child population below six years, percentage of SC & ST female population and percentage of urban population. The female participation rate in agriculture increased significantly across the districts.*

**Keywords:** Female participation, labour force, non-foodgrains, urban population and child population

**1. Introduction:** Among these variables, sector, religion, age, general education and current marital status can directly influence the decision of women to go into the labour force. Lee, Jang, (2008) included demographic characteristics, such as marital status, education, age, migration status, whether she lived with person who is older than 60, as independent variables. Sebastian and Navaneetham (2005) used multivariate logistic regression analysis to determine the factors that influence female work participation. The study used both individual characteristics - level of education, age, marital status, religion, place of residence. To find out these kinds of relationships the direct variables have been taken. Sebastian and Navaneetham (2005) examined that within education, diploma and professional education shows maximum odds ratio where women with diploma and professional education have six and eighteen times more probability respectively to be employed compared to women with higher secondary or secondary education. It shows importance of skill-oriented education rather than general education in improving the employability of women. For this the technical education is taken here. Number of household member, relation with household head, household type, land possessed and monthly consumption on non-durables are taken as proxy to show the demographic characteristics and financial capabilities of respondents' families. Some variables like number of household member, relation with household head have been taken to reveal family structure of the respondent; it shows the fact that whether they are having support from the family or having pressure from the family. Dasgupta and Goldar (2005) investigated for rural female labour supply in India using NSS data for 1999- 00 and indicated that supply of female labour from below poverty line households in rural areas is inversely related to the number of earning members in the family.

We analyze the factors of female participation rate in agriculture like female literacy rate, percentage of area under foodgrain, percentage of child population below six years, percentage of SC & ST female population and percentage of urban population. The female participation rate in agriculture increased significantly across the districts.

## **2. The Specific objectives of the study are given below:**

- i. To analyse the factor that explain the female participation in agriculture in districts of West Bengal.
- ii. To examine the Probit Estimates of female participation in agriculture.
- iii. To analyse the factor that explain the female participation in agriculture in micro level of Paschim Medinipur district.

### **3. Methodology and Data Source:-**

#### *Secondary Data*

Secondary data relating to female worker have been collected from various government sources, namely Statistical Abstract, Economic Review, District Statistical Handbook, Ministry of Agriculture, Government of West Bengal and Census of India

However, on account of the limitations of the secondary data and for the sake of an in-depth and detailed study we have tried to collect and use primary data to analyse our research questions.

#### *Primary Data*

This study is based on primary data. Paschim Medinipur district in West Bengal is purposely chosen for the present study for the field survey. Two blocks from the district namely Sabang and Garhbeta-II and Five villages are randomly drawn from the village list of each block. Accordingly we have ten selected villages. In each village 20 women were randomly selected. Therefore a total of 200 women were selected from a population of 897. The data of the present study were collected by questionnaires survey, interviewing, and directly observation during the field survey of the study area in the session 2016-17

#### **Probit Model:**

For specific purpose probit model is used to estimate the regression parameters. The steps involved in the estimation of the probit model are as follows:

a) From the grouped data, estimate the probability that an event will occur, i.e.  $P_i$ . This  $P_i$  is estimated by  $n_i/N_i$ , where  $n_i$  is observed frequency and  $N_i$  is total frequency.

b) Given estimated  $P_i$ , obtain normal equivalent deviate ( $n.e.d$ ) ( $=I_i$ ) from the standard normal cumulative distribution function (CDF).

That is,  $I_i = F^{-1}(P_i) = \beta_1 + \beta_2 X_i$

c) Use the estimated  $I_i$  obtained as the dependent variable in the regression, i.e.

$I_i = \beta_1 + \beta_2 X_i + U_i$

d)  $R^2$  as a measure of goodness of fit is not particularly well-suited for the dichotomous dependent variable models, one suggested alternative as the  $\chi^2$  test. Apply the  $\chi^2$  test to regression and comment on the resulting goodness of fit.

### **4. Results and Discussion**

Female labour force participation rate are also different among the districts of West Bengal. The female labour force participation rate varies from as low as about 1% to as high as about 15%. In 2011 female labour participation rate in agriculture in Purulia district (17.65) is highest followed by Bankura (14.94), Paschim Medinipur (14.81), Dakhin Dinajpur (13.28), Coochbihar (9.82), Uttar Dinajpur (9.40), Birbhum (8.77), Burdwan (7.27), Malda (7.05), Jalpaiguri (6.83), Purba Medinipur (6.44), Hooghly (6.20) and lowest in Howrah district (0.90). In 2011 female participation rate in agriculture in Purulia district (22.21) is highest followed by Paschim Medinipur (17.74), Bankura (16.81), Dakhin Dinajpur (16.38), Cooch bihar (14.35), Uttar Dinajpur (11.62), Birbhum (9.77), Malda (8.55), Jalpaiguri (8.54), Purba Medinipur (8.44), Burdwan (7.89), Hooghly (6.94), Derjeeling (5.20) and lowest in Howrah (1.31). In 1991 the female participation rate in agriculture in Purulia district is highest followed by Bankura (11.89), Paschim Medinipur (6.86), Dakhin Dinajpur (8.57), Cooch bihar (4.07),and lowest in Howrah (0.48). Female labour participation rate in agriculture in Purulia district is highest and lowest in Howrah district in 1991 to 2001. Female labour participation and female participation in agriculture were grown in above 100 per cent area in Bankura, North 24 Parganas and South 24 Parganas, Nadia, Murshidabad, Dakhin Dinajpur, Jalpaiguri districts during 1991 to 2001 (Table 1). Almost all the districts except Derjeeling witnessed increase in female participation in agriculture during 1991 to 2001(Figure 1). Almost all the districts except Paschim Medinipur, 24- Parganas and Murshidabad decrease in female participation rate in agriculture during 2001 to 2011 (Table 1).

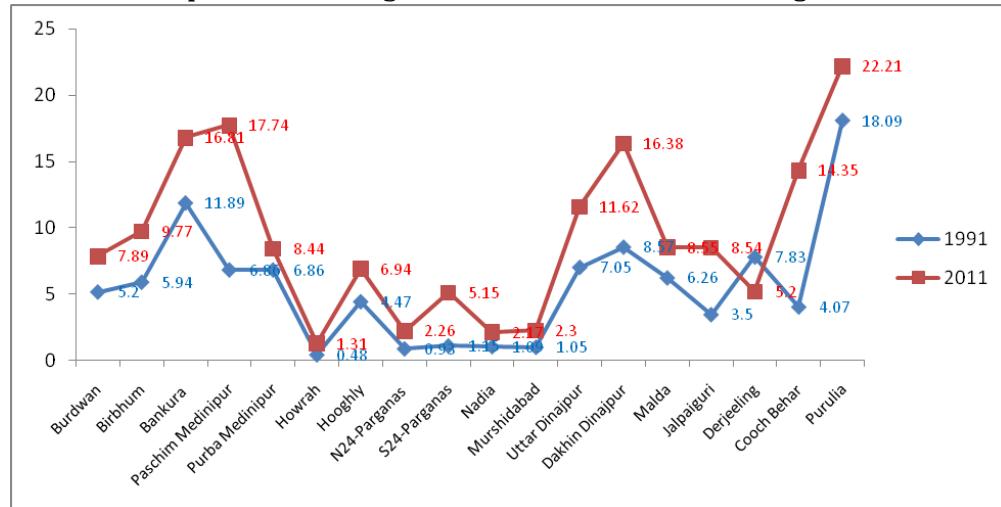
**Table 1. Female Labour and Female Participation Rate in Agriculture in Districts of West Bengal**

	Female Participation Rate in Agriculture			Female Labour Participation Rate in Agriculture (%)		
	1991	2001	2011	1991	2001	2011
Burdwan	5.20	8.02	7.89	4.76	7.02	7.27
Birbhum	5.94	11.29	9.77	4.86	9.25	8.77
Bankura	11.89	22.56	16.81	8.52	15.62	14.94
Paschim Medinipur	6.86	14.67	17.74	4.40	9.55	14.81

Purba Medinipur	6.86	12.69	8.44	4.40	8.43	6.44
Howrah	0.48	1.04	1.31	0.30	0.73	0.90
Hooghly	4.47	7.37	6.94	4.21	5.85	6.20
N24-Parganas	0.93	1.89	2.26	0.77	1.38	1.83
S24-Parganas	1.15	5.00	5.15	0.68	3.06	3.81
Nadia	1.09	2.86	2.17	0.92	1.56	1.70
Murshidabad	1.05	2.15	2.30	0.81	1.50	1.80
Uttar Dinajpur	7.05	17.12	11.62	5.64	12.26	9.40
Dakhin Dinajpur	8.57	16.71	16.38	6.56	12.63	13.28
Malda	6.26	10.95	8.55	5.03	8.76	7.05
Jalpaiguri	3.50	10.10	8.54	2.23	6.05	6.83
Derjeeling	7.83	6.77	5.20	2.45	2.87	2.83
Cooch Behar	4.07	16.55	14.35	2.84	9.55	9.82
Purulia	18.09	28.63	22.21	7.97	18.83	17.65

Source: Statistical Abstract & Economic Review of West Bengal

#### Female Participation Rate in Agriculture in districts of West Bengal, 1991 to 2011



Many researchers examined the relationship between educational attainment and female labour force participation rate. Some determines that there is a weaker positive pull of education into the labour market (Hotchkiss, 2005). Thus, there is a huge set of variables that can influence the decision of women to join labour force.

We analyze the factors of female participation rate in agriculture (FPA) like female literacy rate (FL), percentage of area under foodgrain(PAF), percentage of child population below 4 years(PCP), percentage of SC & ST female population (SCSTP) and percentage of urban population(PUP). The female literacy rate increased significantly across the districts. Female participation in agriculture is seen to be related to female literacy rate (FL), percentage of area under foodgrain (PAF), percentage of child population below 4 years (PCP), percentage of SC & ST female population (SCSTP) and percentage of urban population (PUP) (Table 2)

We may now examine how far the variations in female participation rate are explained by those in PAF, PCP, SCSTP, PUP and FL. Table 2 reveals that the variation in FPA in 2011 is explained by five variables, PAF, PCP, SCSTP, PUP and FL to the extent of 81 per cent. The coefficient of PAF is significant at 1 per cent level, coefficient of FL is significant at 5 per cent level, coefficient of PUP is significant at 1 per cent level, coefficient of PCP is significant at 5 per cent level, and the whole model is significant at 1 per cent level, F value being 15.64.

**Table 2. Female Participation in Agriculture, Percentage of Urban Population, Female Literacy Rate, Percentage of child population, Percentage of area under foodgrains and SC & ST Female population in 2011**

	Female participation rate in agriculture	% SC & ST female population	% of area under foodgrain	Female Literacy rate	% of child population below 4 years	% of Urban population
Burdwan	7.89	16.61	70.37	69.63	7.49	39.89
Birbhum	9.77	17.90	60	64.14	8.86	12.83
Bankura	16.81	21.30	63	60.05	8.03	8.33
Paschim Medinipur	17.74	16.88	83	70.5	8.02	12.22
Purba Medinipur	8.44	7.37	66.88	81.37	8.09	11.63
Howrah	1.31	7.41	70.9	79.43	7.53	63.38
Hooghly	6.94	14.11	54.45	76.36	6.75	38.57
N24-Parganas	2.26	11.83	50.85	80.34	6.66	57.27
S24-Parganas	5.15	15.26	74.61	71.4	8.80	25.58
Nadia	2.17	15.83	47.64	70.98	7.07	27.84
Murshidabad	2.30	6.79	48.48	63.09	9.95	19.72
Utar Dinajpur	11.62	15.65	64.95	52.17	10.89	12.05
Da.Dinajpur	16.38	22.18	66.14	67.01	7.68	14.10
Malda	8.55	14.02	62.18	56.96	10.43	13.58
Jalpaiguri	8.54	27.71	48	66.23	8.25	27.38
Darjeeling	5.20	19.27	33	73.33	7.06	39.42
Cooch Behar	14.35	24.64	61.22	68.49	8.50	10.27
Purulia	22.21	18.63	85.5	50.52	9.60	12.74

Source: Statistical Abstract & Economic Review of West Bengal

$$FPRA_{2011} = 37.95 + 0.229 PFA^{***} - 0.320 FL^{**} - 2.48 PCP^{**} + 0.239 SCSTP - 0.173 PUP^{***}$$

$$(1.77) \quad (4.39) \quad (-2.09) \quad (-2.20) \quad (1.48) \quad (3.08)$$

$$R^2 = 0.86, \quad R^2 = 0.81, \quad F = 15.64, \quad \text{Sign. } F = 0.000$$

FPA= female participation rate in agriculture, PAF= percentage of area under foodgrains, FL= female literacy rate, SCSTP = percentage of SC & ST female population, PCP = percentage of child population below 4 years, PUP = percentage of urban population, \*\*\* and \*\* Indicates coefficient significant at 1% and 5% level

We examine the strength of relationship between these variables. For this purpose we prepare correlation matrix which is shown Table 3. It is found that the correlation coefficient between FPA and percentage of area under foodgrains is 0.587 which is significant at 5 percent level. The correlation coefficient between FPA and female literacy rate is - 0.571 which is significant at 5 percent level. Similarly the correlation coefficient between FPA and SCSTP is 0.548 which is significant at 5 percent level. The correlation coefficient between FPA and percentage of urban population is - 0.690 which is significant at 1 percent level (Table 3).

**Table 3 District Level Correlation Matrix, 2011**

	FPA	PFA	FL	PCP	SCSTP	PUP
FPA	1					
PFA	0.587*	1				
FL	- 0.571*	-0.246	1			
PCP	0.284	0.295	-0.790**	1		
SCSTP	0.548*	- 0.072	- 0.352	-0.056	1	
PUP	- 0.690**	- 0.294	0.629**	- 0.601**	-0.348	1

FPA= female participation rate in agriculture, PAF= percentage of area under foodgrains, FL= female literacy rate, SCSTP = percentage of SC & ST female population, PCP = percentage of child population below 4 years, PUP = percentage of urban population, \*\* and \* Indicates coefficient significant at 1% and 5% level

In 2001 we analyze the factors of female participation rate in agriculture (FPA) like female literacy rate (FL), percentage of area under foodgrain (PAF), percentage of child population below six years (PCP), percentage of SC & ST female population (SCSTP) and percentage of urban population(PUP). The female literacy rate increased significantly across the districts. Female participation in agriculture is seen to be related to female literacy rate (FL), percentage of area under foodgrain (PAF), percentage of child population below 4 years (PCP), percentage of SC & ST female population (SCSTP) and percentage of urban population (PUP) (Table 3)

We may now examine how far the variations in female participation rate are explained by those in PAF, PCP, SCSTP, PUP and FL. Table 3 reveals that the variation in FPA in 2001 is explained by five variables, PAF, PCP, SCSTP, PUP and FL to the extent of 49 per cent and the whole model is significant at 5 per cent level, F value being 4.33.

**Table 3. Female Participation in Agriculture, Percentage of Urban Population, Female Literacy Rate, Percentage of child population, Percentage of area under foodgrains and SC & ST Female population in 2001**

District	Female participation in Agriculture	% of Urban Population	Female Literacy Rate	% of child population below 6 years	% of area under foodgrains	% of Sc & ST Female population
Burdwan	8.02	36.94	60.95	13.10	75.37	16.33
Birbhum	11.29	8.57	51.55	16.19	79.77	17.72
Bankura	22.56	7.37	49.43	14.37	81.5	20.50
Paschim Medinipur	14.67	11.9	59.11	14.48	77.93	14.88
Purba Medinipur	12.69	8.29	70.7	14.27	84.17	9.26
Howrah	1.04	50.36	70.11	12.01	69.37	7.77
Hooghly	7.37	33.47	67.21	11.96	51.02	13.77
N24-Parganas	1.89	54.3	71.72	11.80	58.47	11.06
S24-Parganas	5.00	15.73	59.01	15.20	81.25	16.14
Nadia	2.86	21.27	59.58	13.17	48.12	15.67
Murshidabad	2.15	12.49	47.63	17.80	68.26	6.49
Utar Dinajpur	17.12	12.06	36.51	21.02	55.74	15.96
Da.Dinajpur	16.71	13.1	54.28	16.37	66.08	21.98
Malda	10.95	7.32	41.25	19.45	75.1	11.64
Jalpaiguri	10.10	17.84	52.21	15.33	64.54	27.14
Darjeeling	6.77	32.34	62.94	12.72	52.89	14.16
Cooch Behar	16.55	9.1	56.12	15.62	34.35	24.72
Purulia	28.63	10.07	36.5	16.12	91.82	17.92

*Source: Statistical Abstract & Economic Review of West Bengal*

$$FPRA_{2001} = 41.38 - 0.183PUP - 0.397 FL - 1.20 PCP + 0.414 SCSTP + 0.104 PFA$$

$$(1.08) \quad (-1.27) \quad (-1.52) \quad (-1.00) \quad (1.35) \quad (1.02) \\ R^2 = 0.64 \quad R^2 = 0.49 \quad F = 4.33, \quad Sign. F = 0.017$$

FPA= female participation rate in agriculture, PAF= percentage of area under foodgrains, FL= female literacy rate, SCSTP = percentage of SC & ST female population, PCP = percentage of child population below 4 years, PUP = percentage of urban population

In 1991 we analyze the factors of female participation rate in agriculture (FPA) like female literacy rate (FL), percentage of area under foodgrain(PAF), percentage of child population below six years (PCP), percentage of SC & ST female population (SCSTP) and percentage of urban population(PUP). The female literacy rate increased significantly across the districts. Female participation in agriculture is seen to be related to female literacy rate (FL), percentage of area under foodgrain (PAF), percentage of child population below 4 years (PCP), percentage of SC & ST female population (SCSTP) and percentage of urban population (PUP) (Table 4)

We may now examine how far the variations in female participation rate are explained by those in PAF, PCP, SCSTP, PUP and FL. Table 4 reveals that the variation in FPA in 1991 is explained by five variables, PAF, PCP, SCSTP, PUP and FL to the extent of 58 per cent. The coefficient of PAF is significant at 5 per cent level, coefficient of FL is significant at 1 per cent level, coefficient of PUP is significant at 10 per cent level, coefficient of PCP is significant at 1 per cent level, and the whole model is significant at 1 per cent level, F value being 5.67.

**Table 4. Female Participation in Agriculture, Percentage of Urban Population, Female Literacy Rate, Percentage of child population, Percentage of area under foodgrains and SC & ST Female population in 1991**

District	Female participation in Agriculture	% of Urban Population	Female Literacy Rate	% of child population below 6 years	% of area under foodgrains	% of Sc & ST Female population
Burdwan	5.20	35.1	51.5	16.22	75.98	16.26
Birbhum	5.94	8.98	37.2	19.03	80.97	18.32
Bankura	11.89	8.29	36.6	16.65	82.74	20.45
Paschim Medinipur	6.86	12.7	52.5	17.68	82.88	22.37
Purba Medinipur	6.86	6.6	61.5	17.68	82.88	22.37
Howrah	0.48	49.6	57.8	15.01	80.04	7.75
Hooghly	4.47	31.2	56.9	14.83	61.50	13.72
N24-Parganas	0.93	51.2	58	15.13	67.85	11.42
S24-Parganas	1.15	13.3	40.6	19	84.64	17.22
Nadia	1.09	22.6	44.4	16.63	61.38	15.12
Murshidabad	1.05	10.4	29.6	20.95	67.95	7.12
Utar Dinaipur	7.05	13.3	22.9	20.49	77.59	16.78
Da.Dinaipur	8.57	13.4	35.3	18.77	77.59	21.92
Malda	6.26	7.07	24.9	20.82	76.58	11.98
Jalpaiguri	3.50	16.4	33.2	18.28	63.88	28.01
Derjeeling	7.83	30.5	47.8	15.49	61.13	14.44
Cooch Behar	4.07	7.81	33.3	18.91	72.98	25.32
Purulia	18.09	9.44	23.2	18.59	90.74	18.81

*Source: Statistical Abstract & Economic Review of West Bengal*

$$FPRA_{1991} = 54.07^{**} - 0.212 PUP^* - 0.297 FL^{***} - 2.75 PCP^{***} - 0.026 SCSTP + 0.232 PFA^{**}$$

$$(2.74) \quad (-2.06) \quad (-3.19) \quad (-3.47) \quad (-0.15) \quad (2.75)$$

$$R^2 = 0.70 \quad R^2 = 0.58, \quad F = 5.67, \quad \text{Sign. } F = 0.006$$

FPA= female participation rate in agriculture, PAF= percentage of area under foodgrains, FL= female literacy rate, SCSTP = percentage of SC & ST female population, PCP = percentage of child population below 4 years, PUP = percentage of urban population, \*\*\* and \*\* Indicates coefficient significant at 1% and 5% level

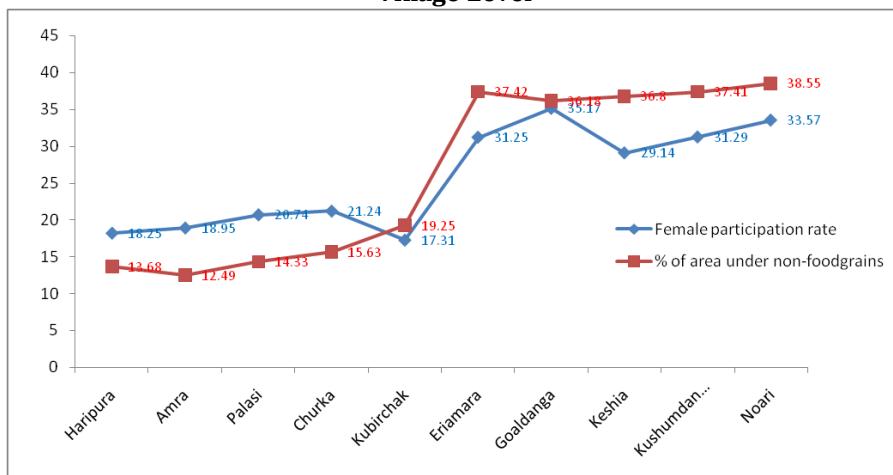
In village level female participation rate in agriculture is highest in Goaldanga (35.17) followed by Noari (33.57), Kushumdanga (31.29), Eriamara (31.25), Keshia (29.14), Churka (21.24), Palasi (20.74), Amra (18.95) and Haripura (18.25) (Table 5 & Figure 2). Female literacy rate is highest in Haripura (81.24) followed by Amra (80.11), Churka (78.23), Palasi (78.15) and lowest in Goaldanga (65.14). Percentage of SC and ST population is highest in Noari (40) followed by Goaldanga (35), Eriamara & Kushumdanga (30) and lowest in Haripura and Amra (15). Percentage of area under non-foodgrains is highest in Noari (38.55) followed by Eriamara (37.42), Kushumdanga (37.41), Keshia (36.80) and lowest in Amra (12.49) (Figure 2). Percentage of area under foodgrains is highest in Amra (87.51) followed by Haripura (86.32), Palasi (85.67), Churka (84.37), Kubirchak (80.75) and lowest in Noari (61.45). Child population in Palasi (7) is highest followed by Haripura (6), Amra (6), Churaka (6) and lowest in Keshia (3).

**Table 5. Female Participation in Agriculture, Female Literacy Rate, child population, Percentage of area under foodgrains and SC & ST Female population in Paschim Medinipur.**

Village	Female participation rate	Female labour participation Rate	Female Literacy rate	% of SC ST female population	Child population	% of area under foodgrains	% of area under non-foodgrains
Haripura	18.25	12.21	81.24	15	6	86.32	13.68
Amra	18.95	13.58	80.11	15	6	87.51	12.49
Palasi	20.74	17.25	78.15	20	7	85.67	14.33
Churka	21.24	16.52	78.23	20	6	84.37	15.63
Kubirchak	17.31	14.63	81.25	15	4	80.75	19.25
Eriamara	31.25	27.64	65.28	30	3	62.58	37.42
Goaldanga	35.17	28.41	65.14	35	4	63.82	36.18
Keshia	29.14	22.51	67.53	25	3	63.2	36.80
Kushumdanga	31.29	27.89	66.32	30	4	62.59	37.41
Noari	33.57	27.22	65.55	40	4	61.45	38.55

*Source: Field Level Survey*

**Figure 2 Female Participation in Agriculture and Percentage of Area under Non-Foodgrains in Village Level**



**Theoretical framework:** The empirical specification of the dichotomous binary choice model is employed to investigate the agricultural practice decision of female. A probit model was developed to examine the relationship between socio-economic characteristics and the level of participation of female in agriculture. The demographic variables included in the empirical model are given in Table 6. The dependent variable is whether or not the female participates in agricultural activities in Paschim Medinipur. The female demographic variables are age of the female ( $X_1$ ), level of female education ( $X_2$ ), children population below six years ( $X_3$ ), husband's occupation ( $X_4$ ), percentage of area under non-foodgrain cultivation( $X_5$ ), non-farm income per year ( $X_6$ )

$$FPRA = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + U$$

Age is a variable that measures the age of the woman in years. Age may influence an individual's level of participation in agriculture. Husband's occupation is a dummy variable. It takes on the value of 1 if husband is cultivator and 0 if not.

ELF measures level of education of the female. The more educated the woman is, the less likely she would participate in agricultural production due to more and better available job offers than farming. NFI measures the level of income for non-farm activity of family. It is expected that the sign of this coefficient be negative.

In village level we analyze the factors of female participation rate in agriculture (FPA) like female education level (FEL), percentage of area under non-foodgrains (PANF), child population below six years (CP), percentage of SC & ST female population (SCSTP), age of female (AF) and non-farm income (NFI).

#### 4. The Empirical Results : Probit Estimates

The empirical results relating to the female participation in agriculture (FPA) (Dummy variable) are presented in Table 6. The Percentage of area under non-foodgrain cultivation (PANF) is positively and significantly associated in female participation. It is highly significant (1 % level) for non-farm income (NFI). In Probit model there exists a negative relationship between female education level (ELF) and female participation in agriculture. This negative relationship is statistically significant at 5% level. Participation of female in agriculture is significantly influenced by husband occupation (HO). Similarly female participation in agriculture is negative and significantly (1% level) influenced by child population below six years.

**Table 6 Probit Estimates of Female Participation in Agriculture(FPA)**

Variable	Coefficient	t-value/z-value	p> z	
Intercept	1.646	0.64	0.520	Pearson Goodness of fit
ELF	-0.244	-2.13**	0.033	Chi-square = 236.32
CP	-2.265	-2.90***	0.004	No. of observation =200
AF	-0.106	-2.11**	0.035	P= 0.000
HO	3.25	3.15***	0.002	R <sup>2</sup> = 0.89
PANF	0.269	3.64***	0.000	
NFI	-0.000	-2.76***	0.006	

ELF = Education level of female,

CP = Children population below six years

AF = Age of female

HO = Husband's occupation (Trade or Service =0, Cultivation= 1)

PANF = Percentage of area under non-foodgrain cultivation

NFI = Non-farm income per year

\*\*\* and \*\* Indicates coefficient significant at 1% and 5% level

## 5. Conclusion

Female labour force participation rate are also different among the districts of West Bengal. The female labour force participation rate varies from as low as about 1% to as high as about 15%. Female labour participation rate in agriculture in Purulia district is highest followed by Bankura, Paschim Medinipur, Dakhin Dinajpur, Coochbihar, Uttar Dinajpur, Birbhum, Burdwan, Malda, Jalpaiguri, Purba Medinipur, Hooghly and lowest in Howrah district during 1991 to 2011. Female participation rate in agriculture in Purulia district is highest followed by Paschim Medinipur, Bankura, Dakhin Dinajpur, Cooch bihar, Uttar Dinajpur, Birbhum, Malda, Jalpaiguri, Purba Medinipur, Burdwan, Hooghly and lowest in Howrah during this period. We analyze the factors of female participation rate in agriculture like female literacy rate, percentage of area under foodgrain, percentage of child population below six years, percentage of SC & ST female population and percentage of urban population. The female participation rate in agriculture increased significantly across the districts. In village level we analyze the factors of female participation rate in agriculture like female education level, percentage of area under non-foodgrains, child population below six years, percentage of SC & ST female population, age of female and non-farm income.

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