RESEARCH ARTICLE

PARTICIPATION OF FARM WOMEN IN DECISION MAKING A CASE STUDY OF SONIPAT DISTRICT OF HARYANA, INDIA

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ARTICLE INFO	ABSTRACT
	The paper mainly tries to assess the decision making power of rural women in their economic life. Objective of the study is two folds- first to analyze the pattern of decision making in each of the 13 identified areas and second to find out the factors affecting decision making power of women.150 women respondents were investigated to know the level of farm women participation in Agricultural decision-making in the rural areas of Sonipat district of Haryana state. Primary data were collected using structured questionnaire and interview schedule. Regression and observational analysis has been done to achieve the objectives. Results showed that for majority of the households joint decision making prevails for 7 out of 13 decision making areas. Land related decisions, decisions regarding purchase/ sale and selection of animals and household financing decisions are taken jointly by both husband and wife in majority of households. Female decision making is restricted mainly to livestock management. Arrangement of fodder and consumption/sale of milk are the decisions where female have a key role in decision making in majority of households. Hence females are able to take decisions in areas that are part of their household chores. Their role in decision making regarding economic and agricultural activities is negligible. Regression and observational analysis reveal that livestock, size of landholding, age and literacy of woman, nuclear family type and caste are the factors affecting decision making of woman.

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INTRODUCTION

Women in India are major producers of food in terms of value, volume and number of hours worked. Nearly 63 percent of all economically active men are engaged in agriculture as compared to 78 per cent of women. Almost 50 percent of rural female workers are classified as agricultural laborers and 37% as cultivators. About 70 percent of farm work was performed by women. It is observed that women play a significant and crucial role in agricultural development and allied fields including, main crop production, live-stock production, horticulture, post-harvesting operations, agro/social forestry, fishing etc.; it is a fact long taken for granted but ignored since ages. Women across the developing world are disadvantaged relative to men. Under male dominated social structure and political system, women are denied equal access to land structure and extension services (Okafor *et al*., 2002). The failure to consult women or to consider their specific capabilities and responsibilities can prevent new agricultural projects or technologies from adopted.The paper mainly tries

to assess the decision making power of rural women in their economic life. Objective of the study is twofold- first to analyze the pattern of decision making in each of the 13 identified areas and second to find out the factors affecting decision making power of women. With regard to the former, the paper distinguishes between the areas which are male, female and jointly dominated in decision making and with regard to the latter, important factors affecting decision making power of women have been identified.

Methodology

Study Area: A cluster of three villages namely Palrikhurd Palra and Jajal in Sonipat district of Haryana was purposively selected for the study. The study of 150 farm families of different size groups (50 from each village) from the three selected villages of Sonipat district of Haryana were selected for assessing the decision making power of the farm women.

Data: Primary data regarding decision making with respect to different activities by male and female separately and jointly were collected through well-structured and pretested schedule and PRA/Group discussions for the agricultural year 2007-08.

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Analytical Tools: For analyzing the underlying pattern of decision making, percentage of households with male, female and joint decision making has been calculated for each decision area. Broadly, their power of decision making in agriculture, animal husbandry and economic activities have been assessed for. 6, 4 and 3 areas of decision making identified within agricultural, animal husbandry and economic activities respectively. Therefore, a total of 13 areas of decision making have been considered, these decision making areas are crop selection, land selection, pesticide application, sale of farm output in market, purchase/sale of land, land tenancy, purchase/sale of animals, selection of breeds, arrangement of fodder, sale of milk in market or for self-consumption, financial management, borrowing of money and purchase of household items. To identify important factors affecting decision making power of women, decision making power has been modeled using Ordinary Least Square regression technique. That means the function will be estimated from a pool of data in a way that will minimize the sum of the squared differences between the actual and estimated values. Data is cross sectional consisting of 150 females.

If **Y** is the dependent variable and $X_1, X_2, X_3....X_k$ are the k explanatory variables, then OLS regression is given as follows:

$$Y_i = \alpha_i + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + ...+ \beta_k X_{ki} + \varepsilon_i$$

Where α_i is the intercept term, $\beta_1, \beta_2, \beta_3..., \beta_k$ are the partial coefficients to be determined; ε_i is the stochastic error term and i is the ith observation (i=1,2,3......150).

To carry out OLS estimation, the following assumptions need to be satisfied-

The regression model is linear in parameters X Values are fixed.

Covariance $(X, \varepsilon) = 0$.

Normality- ε is normally distributed.

Homoscedasticity- variance of ε is same for all observations
No serial correlation between the disturbances.

No perfect linear relationship between the explanatory variables

General to simple methodology has been followed. Under this, a general model is first developed by using large set of factors affecting decision making. The model is then simplified by dropping the factors that turn out to be insignificant. Some of the criteria that are used to choose between competing models are adjusted R^2, Akaike information criterion and Schwarz information criterion. Out of all competing models, the best will be the one with the highest adjusted R^2, lowest AIC and BIC and whose independent variables are individually as well as jointly significant.

Model Specification

Dependent variable is the decision making power of rural women which has been calculated as follows. Decision making power of woman belonging to i^{th} household= average (13 areas of decision making).Value of 0, 1 and 0.5 has been assigned if decision for a particular area is taken by male alone, female alone and jointly by both male and female respectively. On the basis of theoretical background/ literature review and general conditions of the villages, 8 factors affecting decision making of women have been selected. Table 1 presents the explanatory variables and their description.

Table 1. Description of explanatory variables

Variable	Description
Economic status	Sum of farm, non-farm and livestock income of a household
Size of landholding	Measured in acres
Caste	4 categories- General, SC, ST and OBC
Family type	Nuclear and Joint
Female participation rate	Measured as sum of work hours per day devoted to agriculture, animal husbandry and economic activities
Education attainment	5 categories- Illiterate, Primary, Middle, Matric, Higher secondary and Senior Secondary.
Age	4 categories- less than 21,between 21-35,between 35-50 and above 50
Livestock	1, if family possesses livestock and 0 otherwise

The first seven factors have been selected on the basis of theoretical background whereas livestock is one factor that has been selected on the basis of general knowledge of the villages under study.

Model

Decision making = $\alpha + \beta_1$ economic status $+\beta_2$ size of landholding + β_3 caste + β_4 family type + β_5 female participation + β_6 education + β_7 age + β_8 livestock + €

RESULTS AND DISCUSSION

Socio economic profile of the sample households

To know the social and economic status of the selected households, socio economic profile of the households was seen and data are given in table 2, It has been found that all overall average size of family was 5.47, however in small farm it was 5.49, marginal 4.8 and 6.25 members in large farms size group, It has not shown any relationship with size of holdings and mainly dominated by male. It is interesting to that in the sample workers are more as compared to dependent as worker dependent ratio is 2.45. Literacy rate for male and female is good as to range from 77 to 92 % in male and 50 to 77% in case of female which is above the national literacy rate. Age distribution pattern of the sample function indicated that 60 to 80 % of the told member are coming under 15-59 age group means workers population is more are selected household with an average age of 26 years both for male and female. Analysis of caste fabric revised that landless and share cropper and pronominally of backward cost and other category farmer are of general

Pattern of decision making

Table 2 shows the pattern of decision making for farm related activities. In around 66%, 83% and 80% of the households,

decision of crop selection, pesticide application and sale of marketable output respectively is taken by male members alone whereas for the remaining decision areas consisting of land selection, purchase/sale of land and land tenancy, decision is taken jointly by both husband and wife in majority of households. Further, it is clear from the table that very less households witness female participation in farm related decision making.

As far as pattern of decision making for animal husbandry activities are concerned, it is clear from Table 3 that 82% and 53% of the households witness joint decision making in the purchase/ sale and selection of breed of animals respectively. Regarding fodder arrangement and sale of milk in market, decisions are taken by the female members in around 57% and 55% of households respectively. Hence, animal husbandry decisions are either taken by females alone or taken jointly by both husband and wife. Males alone have a comparatively negligible decision making power in livestock.

Table 1. Socio economic profile of the sample households

Categories						
Particulars	Landless	Share Cultivator	Small	Marginal	Large	Overall
Family size	5.59	5.06	5.49	4.89	6.25	5.47
Male	2.03	2.30	2.37	2.16	3.06	2.34
Female	1.63	1.63	1.86	1.53	2.36	1.81
Children	1.93	1.13	1.50	1.20	0.83	1.32
M-F ratio	1.13	1.41	1.29	1.41	1.32	1.30
W-D ratio	1.85	3.22	2.06	2.89	3.37	2.45
Literacy rate						
Male %	77	81	92	89	92	86
Female %	60	58	61	63	77	65
Age distribution:Male						
0-14	28	20	29	21	15	113
	(31.46)	(22.47)	(31.18)	(24.42)	(14.03)	(24.35)
15-59	60	68	60	5	80	327
	(67.42)	(76.41)	(64.52)	(68.60)	(74.75)	(70.47)
>60	1	1	4	6	12	24
	(1.12)	(1.12)	(4.30)	(6.98)	(1,12)	(5.18)
Female						
0-14	30	14	16	15	10	85
	(37.98)	(22.22)	(22.22)	(24.60)	(12.35)	(23.88)
15-59	49	48	51	42	65	255
	(62.02)	(76.20)	(70.84)	(68.36)	(80.24)	(71.63)
>60	0	1(1.58)	50(6.94)	4(6.54)	6(7.41)	16(4.49)
Average age						
M	22.71	25.35	24.04	7.49	31.44	26.35
F	20.30	48(76.20)	26.57	27.61	31.25	26.20
Caste distribution						
General	8	1	19	25	23	76
	(26.67)	(3.34)	(63.33)	(83.33)	(76.87)	(50.67)
B.C	17	14	6	5	7	49
	(56.67)	(46.66)	(20.00)	(16.67)	(23.33)	(32.67)
S.C	5	14	4	0	0	23
	(16.66)	(46.66)	(13.34)			(15.33)
ST	0	1(3.34)		0	0	1
						(1.33)
Type of family						
Nuclear	21	13	21	20	13	92
	(70.00)	(56.67)	(70.30)	(66.67)	(43.33)	(61.33)
Joint	9	13	9	10	10	58
	(30.00)	(43.33)	(30.00)	(33.33)	(33.33)	(38.67)

Table 2. Decision making pattern of farm women in crop cultivation

Activity	Decision – makers (%)		
	Male	Female	Joint
Crop Selection	66	2.67	31.33
Land Selection	43.33	0.83	55.83
Application of pesticide	83.33	2.67	14
Sale of output in market	80.83	1.67	17.5
Purchase/sale of land	24.17	3.33	72.5
Land tenancy	31.67	5	63.33

Table 3. Decision making pattern of farm women in livestock activities

Activity	Decision- makers (in percentage)		
	Male	Female	Joint
Purchase/sale of animals	9.16	9.16	81.67
Selection of animal breed	37.4	9.16	53.44
Arrangement of fodder	0.76	57.25	41.2
Sale of milk in market/self-consumption	0.76	54.96	44.27

Table 4 reveals the pattern of decision making in economic activities. Decisions for these activities are either taken by male members alone or jointly taken by both man and woman. Regarding decisions concerning financial management and purchase of households, 61% and 68% of the household respectively witness joint decision making whereas for borrowing/ lending decision 53% of the households witness male decision making. Females once again show a low decision making power in economic activities.

Table 4. Decision making pattern of farm women in financial management

Activity	Decision- makers and z-value		
	Male	Female	Joint
Financial Management	37.33	1.33	61.33
Borrowing/lending of money	53.33	0.67	46
Purchase of household items	14	18	68

Factors affecting decision making power of rural women

The data of female decision making shows that for i^{th} household, a female's individual contribution in decision making in areas of agriculture, animal husbandry and economic activities is only 36% on average. By following the general to simple approach, 3 models have been developed. Results of each model have been explained in detail below:

Model 1

Decision making = α + β_1 economic status + β_2 size of landholding + β_3 caste + β_4 family type + β_5 female participation + β_6 education + β_7 age + β_8 livestock + ϵ

Table 5 shows the coefficients of the explanatory variables and their respective p- values.

Table 5. Factors affecting decision making power of rural women

Variable	Coefficient	p-value
Economic status	0	0.079
Size of landholding	-0.003	0.058
General	-0.021	0.354
OBC	-0.014	0.545
ST	-0.045	0.626
Nuclear	0 .048	0.019
Female participation	0.002	0.824
Senior secondary	0.008	0.936
Illiterate	-0.03	0.740
Matric	-0.001	0.995
Middle	-0.026	0.785
Below 21	-0.107	0.030
Between 21-35	-0.059	0.025
Between 35-50	-0.035	0.138
Livestock	0.182	0.000
Constant	0.242	0.027

Prob> F= 0.0000, R-squared = 0.4360, Adjusted R-squared = 0.3681, Root MSE = 0 .08711, AIC= -290.5435 and BIC= - 239.3627

As far as dummy variables are concerned, SC; joint family; higher secondary and female belonging to age group above 50 years are the benchmark categories. Table shows that economic status, size of landholding, family type, age and livestock are significant up to 15% level of significance whereas education, caste and female participation rate are insignificant in explaining decision making power. As far as interpretation of the significant coefficients is concerned, it can be seen that economic status has zero impact on female decision making. Size of landholding, on the other hand, has a negative impact i.e. female decision making power falls by 0.3% with 1 acre increase in land. Female living in nuclear family enjoys 4.85% more decision making power as compared to the one living in joint family. Regarding the age factor, it is clearly visible from the table that older woman enjoy higher decision making as compared to younger woman. Given the benchmark category in case of age factor is 50 years and above, dummy coefficient on the age group 35-50 years implies that woman belonging to this age group enjoy 3.5% less decision making as compared to those falling in the age group 50 and above. Further, woman belonging to the age group 21-35 years and below 21 years enjoy 5.9% and 10.7% less decision making power as compared to woman belonging to the benchmark category. Finally coefficient on livestock implies that female decision making power is 18% more for a household possessing livestock compared to one having no livestock adjusted r-squared of 0.3681 implies that 36.81% of variation in decision making is being explained by these 8 factors. The insignificance of education in explaining decision making is questionable since education attainment is an important means of empowering women. On closely observing the data, it was found that number of illiterate women form 69.33% of the total sample size. Since only 4% and 0.67% of the females have higher and senior secondary educational levels, their true impact on decision making was not evident. Hence it was decided to keep illiterate and literate (formed by clubbing primary, middle, matric, higher secondary and senior secondary) as the only 2 categories so as to clearly see the impact of woman literacy on their decision making power. Model 2 was therefore developed with this small modification.

Model 2

Decision making = α + β_1 economic status + β_2 size of landholding + β_3 caste + β_4 family type + β_5 female participation + β_6 literate + β_7 age + β_8 livestock + ϵ

Table 6. Factors affecting decision making power of rural women

Variable	Coefficient	p-value
Economic status	0	0.074
Size of landholding	-0.003	0.068
General	-0.021	0.348
OBC	-0.015	0.520
ST	-0.042	0.640
Nuclear	0.051	0.010
Female participation	0.002	0.762
Literate	0.025	0.133
Below 21	-0.113	0.018
Between 21-35	-0.0589	0.024
Between 35-50	-0.035	0.125
Livestock	0.182	0.000
Constant	0.206	0.000

Prob> F= 0.0000, R-squared = 0.4330, Adjusted R-squared = 0.3834, Root MSE = 0 .08605, AIC= -297.7646 and BIC= -258.6263

Table 6 clearly reveals that literacy is significant at 15% level for explaining decision making power of women. The coefficient on literacy implies that a literate woman enjoys 2.5% more decision making power as compared to an illiterate

woman. Also, model 2 is an improvement over model 1 since adjusted R-squared has increased to 0.3834 along with a comparatively lower AIC and BIC. Hence women literacy has the expected impact on their decision making. This brings no change in the level of significance of the other factors. Caste and female participation rate remain the insignificant variables. It was observed that fit of the model improved by dropping female participation rate and all the caste categories. This gave rise to the formation of model 3.

Model 3 (Final Model)

Decision making = α + β_1 economic status + β_2 size of landholding + β_3 family type + β_4 literate + β_5 age + β_6 livestock + €

Table 7. Factors affecting decision making power of rural women

Variable	Coefficient	p-value
Economic status	0	0.066
Size of landholding	-0.003	0.025
Nuclear	0.052	0.008
Literate	0 .025	0.115
Below 21	-0.112	0.015
Between 21-35	-0.058	0.023
Between 35-50	-0.035	0.128
Livestock	0.185	0.000
Constant	0.203	0.000

Prob> F = 0.0000, R-squared = 0.4276, Adjusted R-squared = 0.3951,
Root MSE = .08522, AIC= -304.3403   and BIC= -277.2446

Model 3 is the best model in terms of highest adjusted R squared and lowest AIC and BIC. As far as interpretation of the coefficients is concerned, it is clear from the above table that decision making power of a female living in a nuclear family is 5% more than the one living in a joint family. A literate woman has 2.5% more decision making power than illiterate woman. Age also has a positive impact on decision making power of women. The youngest women falling in the age group of below 21 years has the lowest decision making whereas the eldest woman falling in the age group 50 years and above has the highest decision making power. Woman belonging to the intermediate categories enjoy decision making power lying somewhere between the two extremes. Woman falling in the age group 35-50 years, 21-35 years and below 21 years enjoy 3.5%, 5.8% and 11.2% respectively less decision making power as compared to the woman belonging to the age group 50 years and above. Further, it can be seen that female decision making power is 18% more for a household possessing livestock compared to one having no livestock. On the other hand, economic status has zero impact on woman's decision making whereas size of landholding has a negative impact. As farm size increases by 1 acre, decision making power reduces by 0.3%. Hence, the overall analysis reveal that livestock is the most important factor affecting decision making in the 3 villages of Sonipat. In fact, it is quite evident from the data itself that females of the 19 household's not possessing livestock have below average decision making. Wealth of a household indicated by household's economic status and size of landholding has no positive impact on woman decision making power. Lastly, female participation rate being an insignificant variable implies that a higher participation in work does not imply a higher decision making power. It is important

to note though a woman contributes on an average 7 hrs. of work to agricultural, animal husbandry and economic activities but still her contribution has nothing to do with her decision making power. Hence it seems that female in these villages of Sonipat are merely acting as labor possessing 0 or negligible entrepreneurial role. Regression result shows that caste has no significant impact on decision making. However, our understanding of the villages suggests that caste has a great role to play in the decision making of women. In fact, it was well observed that woman belonging to high caste groups have less decision making power. Since this is not visible in the regression possibly due to other factors like livestock playing a more important role, an observational analysis was conducted to see if the expectation is self-fulfilling.

Observational analysis: to see the impact of caste of a household on female decision making

Keeping all other factors at the same level, the observational analysis tries to find out the impact of caste on decision making power of women. All other factors were kept fixed at the desired level i.e. all those households were selected which possess livestock, have nuclear family type, have small farm holding (maximum up to 3.5 acres) along with a literate woman who is 21 years and older. Out of a sample size of 150, there were in all 19 households possessing all desired characteristics. Within these households, 9 and 7 households belonged to the General and SC category respectively. The remaining 3 belonged to the OBC and ST categories and hence were ignored from the analysis. Table 8 shows that a SC woman decision making power is 45% which is greater than that of woman belonging to the general category (39%). Further, by differentiating between the 3 broad categories of age group, it was found that SC woman enjoys higher decision making power compared to woman belonging to general category (Table 9) in each of the age group.

Table 8. Impact of caste of a household on female decision making

SC	General
0.444444	0.388889
0.423077	0.388889
0.5	0.388889
0.423077	0.384615
0.5	0.346154
0.423077	0.346154
0.461538	0.384615
	0.461538
	0.461538
Average: 0.453602	Average: 0.394587

Table 9. Impact of caste and age on female decision making

Age	SC	General
21-35	0.445869	0.373219
35-50	0.5	0.437322
Above 50[1]	NA	NA

Since number of illiterate women is large, another analysis was carried out. All factors except for literacy were kept at the desired level i.e. all those household were selected which possess livestock, have nuclear family type, have small farm holding (maximum up to 3.5 acres) along with an illiterate

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[1]None of the woman fell in the age group 50 & above across the 16 households selected for comparison

woman who is 21 years and older. There are 55 such households. Out of these, general and OBC category consist of 23 households each. Only 9 households belonged to SC category and hence it was dropped from the analysis. Table 10 shows that on average decision making power of woman belonging to the OBC category (41%) is greater than that of woman belonging to general category (39%).Table 11 shows that for woman belonging to the age group 21-35 years, average decision making power of general category woman (41%) is higher as compared to that of OBC category woman (36%) whereas for older women falling in the age group 35 years and above, average decision making power of OBC category woman is higher as compared to that of general category woman. Since majority females fall in the age group 35 years and above, it can be concluded that on an average OBC woman enjoy higher decision making power as compared to woman belonging to general category keeping all other factors constant.

Table 10. Comparative caste effect on decision making

OBC	General
0.333333	0.346154
0.333333	0.307692
0.346154	0.423077
0.307692	0.307692
0.346154	0.423077
0.307692	0.423077
0.346154	0.769231
0.307692	0.423077
0.444444	0.307692
0.5	0.153846
0.388889	0.384615
0.444444	0.384615
0.444444	0.307692
0.444444	0.388889
0.5	0.388889
0.333333	0.388889
0.5	0.388889
0.576923	0.388889
0.5	0.423077
0.384615	0.423077
0.444444	0.384615
0.346154	0.461538
0.615385	0.461538
Average: 0.412858	Average: 0.393906

Table 11. Comparative caste and age effect on decision making

Age	OBC	General
21-35	0.360043	0.410731
35-50	0.428571	0.370014
above 50	0.615385	0.461538
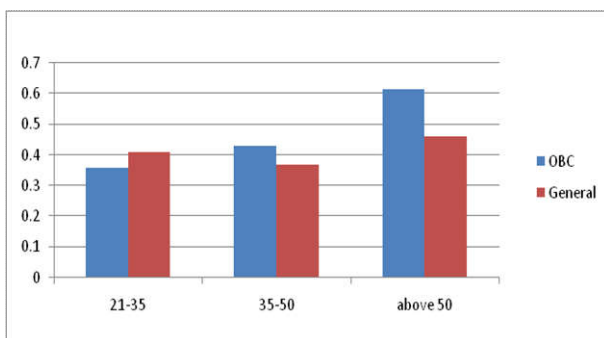
Hence the above analysis reveal that on average woman belonging to general category enjoy low decision making as compared to the one belonging to SC and OBC category which is in line with our expectation. Hence caste factor still plays an important role in these villages with general community restricting their wives from indulging into decision making so as to ensure protection of their tradition and culture.

Conclusion

Hence, overall analysis on pattern of decision making clearly shows that for majority of the household'sjoint decision making prevails for 7 out of 13 decision making areas. Land related decisions; decisions regarding purchase/ sale and selection of breed of animals and household financing decisions are taken jointly by both husband and wife in majority of households. Female decision making is restricted mainly to livestock. Arrangement of fodder and self-consumption/sale of milk are decisions where female have a key role in decision making in majority of households. Hence females are able to take decisions in areas that are part of their household chores. Their role in economic and agricultural decision making is negligible. Regression and observational analysis reveal that livestock, size of landholding, age and literacy of woman, nuclear family type and caste are the factors affecting decision making of woman in Sonipat.The pattern and factors affecting decision making of woman clearly indicate need for policy intervention. Through increased livestock related activities and educational attainment of woman, decision making power of woman can be increased to a great extent.

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